



07/15/2021

# Automation Anywhere

## Automation 360

# Contents

Explore.....	8
Automation 360 Release Notes.....	9
Automation 360 v.21 Release Notes.....	9
Enterprise A2019.20 Release Notes.....	35
Enterprise A2019.19 Release Notes.....	58
Enterprise A2019.18 Release Notes.....	78
Enterprise A2019.17 Release Notes.....	98
Enterprise A2019.16 Release Notes.....	124
Enterprise A2019.15 Release Notes.....	149
Enterprise A2019.14 Release Notes.....	166
Enterprise A2019.13 Release Notes.....	181
Enterprise A2019.12 Release Notes.....	192
Enterprise A2019.11 Release Notes.....	204
Enterprise A2019.10 Release Notes.....	214
Enterprise A2019 (Build 2094) Release Notes.....	221
Enterprise A2019 (Builds 1598 and 1610) Release Notes.....	228
Enterprise A2019 (Builds 1082 and 1089) Release Notes.....	233
Enterprise A2019 (Build 550) Release Notes.....	240
Enterprise A2019 (Build 543) Release Notes.....	241
Community Edition Release Notes.....	245
Automation 360 v.21 Community Edition Release Notes.....	245
Community Edition A2019.20 Release Notes.....	250
Community Edition A2019.19 Release Notes.....	255
Community Edition A2019.18 Release Notes.....	258
Community Edition A2019.17 Release Notes.....	265
Automation 360 v.21 Cloud Preview Sandbox Release Notes.....	272
Cloud preview sandbox environment.....	292
About Automation 360.....	293
Control Room overview.....	296
Distributed Architecture.....	298
Automation 360 FAQ.....	299
Automation 360 feature comparison matrix.....	301
Automation 360 IQ Bot.....	314
Automation 360 IQ Bot feature comparison matrix.....	316
Automation 360 IQ Bot version compatibility.....	321
Automation Anywhere Robotic Interface (AARI).....	322
Attended and unattended automation.....	324
Private Bot Store.....	324
Security architecture.....	325
Security architecture model.....	326
Securing the RPA environment with external controls.....	330
Independent categories for Bot Creators and Bot Runners.....	332
Role-Based Access Control.....	332
Bot execution access by dynamic access token.....	336
Secure credential store through Credential Vault.....	336
Authentication with Control Room.....	337
Support for secure protocols.....	339
Network security overview.....	339
Change management.....	340
Identity and authentication.....	340

Defenses against common vulnerabilities.....	342
Compliance and vulnerability scanning.....	344
Audit logs.....	344
Additional security controls.....	346
Automation Anywhere Mobile app.....	348
Mobile application FAQs.....	349
Connecting manually to an Control Room.....	349
General Data Protection Regulation guidelines.....	349
Install and update.....	350
Get started with Automation 360 Cloud.....	352
Automation 360 Cloud prerequisites.....	353
Installing Control Room On-Premises.....	357
Automation 360 On-Premises prerequisites.....	359
Installing Control Room using Custom mode.....	404
Installing Control Room using Express mode.....	419
Installing Control Room on Amazon Web Services.....	421
Installing Control Room on Microsoft Azure.....	427
Installing Control Room on Google Cloud Platform.....	436
Installing Control Room on Linux.....	442
Installing Control Room on Microsoft Windows Server using scripts.....	449
Complete Control Room post-installation configuration.....	453
Uninstalling Automation 360.....	463
Installing Control Room for Cloud-enabled deployment.....	463
Post-installation user management.....	464
Configure Control Room authentication options.....	465
Preparing for users.....	475
Installed Control Room directories and files.....	477
Automation 360 licenses.....	480
Get started with Community Edition.....	485
Community capacity and limitations.....	486
Log in to Automation Anywhere Control Room.....	487
Install Bot agent and register device.....	488
About the Bot agent.....	490
Bot agent compatibility.....	491
Working with the Bot agent.....	499
Perform silent installation of Bot agent on temporary devices.....	500
Automatically update the Bot agent.....	502
Manually update the Bot agent.....	503
Switch Bot agent to a different Control Room.....	504
Set user device credentials.....	505
Connect Bot agent to a device with a proxy.....	505
Connect Bot agent to a device with a proxy using a script.....	506
Perform Bot agent diagnostic checks.....	506
Create your first bot.....	509
Run your first bot.....	510
Update to latest Automation 360 version.....	511
Update Automation 360 on Microsoft Windows Server using scripts.....	512
Install and update Automation 360 IQ Bot.....	514
IQ Bot system requirements.....	515
Updating Automation 360 IQ Bot.....	518
Get started with IQ Bot.....	520
Migrate.....	522
Check migration readiness.....	525
Supported versions for migration.....	525

Bot Scanner overview.....	536
Plan and prepare for migration.....	546
Choose deployment model.....	547
Get migration license.....	549
Prepare for 11.x to Automation 360 Cloud migration.....	550
Prepare to manually migrate to Automation 360 Cloud.....	554
Prepare for 11.x to Automation 360 Cloud-enabled migration.....	556
Prepare for 11.x to Automation 360 On-Premises migration.....	557
Prepare for 11.x to Automation 360 on Linux CentOS migration.....	565
Prepare for 10.x to Automation 360 On-Premises migration.....	566
Prerequisite tasks for migrating bots.....	572
Migrate and validate bots.....	573
Migrate Enterprise bots.....	573
Validating and updating bots after migration.....	585
Package mapping for migration.....	586
Variable mapping for migration.....	617
Verify the bot migration.....	630
View migration reports.....	631
View changes to migrated bots using Migration Assistant.....	632
Migrate Community Edition bots.....	633
Migrate to Automation 360 IQ Bot.....	634
Migrate earlier IQ Bot versions to Automation 360 IQ Bot On-Premises.....	636
Migrate from Automation 360 IQ Bot On-Premises to Cloud.....	639
Build.....	642
Bot editor for creating bots.....	642
Actions palette content for bot creation.....	643
Get started with recorders.....	991
Working with bots.....	1013
Keyboard shortcuts.....	1024
Variables overview.....	1026
Bot dependencies.....	1045
Get started building bots.....	1047
Build a Go be Great bot.....	1048
Build a basic bot that uses a desktop application.....	1049
Example of extracting data from a web table.....	1050
Examples of building bots.....	1052
Example of entering data into a web form from a worksheet.....	1052
Example of passing a value between bots.....	1054
Example of using a conditional statement.....	1055
Example of using Python script to join a list.....	1057
Example of transferring data from CSV file to Excel worksheet.....	1058
Run TaskBot to merge Excel sheets.....	1062
Example of migrating data from Excel to a database.....	1063
Example of using the Run action.....	1064
Example of using the SOAP web service action.....	1067
Build a Bot Insight dashboard bot.....	1068
Using AARI on the web interface.....	1071
AARI web interface users.....	1074
Configuration - set up roles.....	1076
Configure processes.....	1079
Deploy processes.....	1092
Get started with AARI desktop.....	1104
About AARI Assistant.....	1104
Using interactive forms.....	1105
Adding a trigger to run a bot.....	1120

Example for using hot key to trigger a bot.....	1124
Process Discovery using Discovery Bot.....	1125
Get started with Discovery Bot.....	1126
Discovery Bot users.....	1127
Prerequisites for Discovery Bot.....	1129
Upgrade Discovery Bot from Enterprise A2019.15 to later versions.....	1130
Supported licenses for Discovery Bot.....	1131
Create users for Discovery Bot.....	1134
Create a Discovery Bot process.....	1140
Supported applications and browsers for Discovery Bot.....	1142
Record a Discovery Bot business process.....	1143
Analyzing processes for automation.....	1147
Review and compare recording data.....	1149
Create a process view with branches and opportunities.....	1151
Review opportunities and convert to bot.....	1159
Using IQ Bot for intelligent document processing.....	1164
Create a learning instance in Automation 360 IQ Bot.....	1165
Requirements for creating a learning instance in IQ Bot Community Edition.....	1165
IQ Bot standard forms.....	1166
Create Azure Form Recognizer and Storage.....	1168
Create Azure Form Recognizer model.....	1169
Configure standard forms in IQ Bot.....	1170
Create a learning instance by using standard forms.....	1170
Extract information from documents.....	1173
Validate documents.....	1174
Preprocessing error messages.....	1174
Build advanced bots and packages.....	1175
Package Software Development Kit (SDK).....	1175
Build a bot using REST Web Services and JavaScript actions.....	1236
Post to Salesforce through custom app with OAuth 2.0.....	1240
Use Python to build a bot to parse JSON response.....	1243
Use JavaScript to build a bot to take user input.....	1246
Bot developer recommendations.....	1247
Bot Store submissions checklist.....	1247
Building reusable bots.....	1247
Building reusable packages.....	1254
Troubleshooting and debugging.....	1256
Troubleshoot bot run issue.....	1256
Debugger features.....	1257
Bot agent log files.....	1257
Manage.....	1260
Activity.....	1260
Schedule.....	1261
Historical activity.....	1265
Audit Log.....	1267
About event triggers.....	1270
Adding event triggers.....	1271
Linking event triggers to a Bot Runner.....	1272
Devices.....	1273
About multi-user devices.....	1275
About device pools.....	1278
Customize device settings.....	1285
Workload management.....	1286
Create workload queues.....	1287
Run bot with queue.....	1293

Manage workload queues.....	1295
Manage Work Items.....	1303
Managing packages.....	1305
Add packages to the Control Room.....	1306
Manage Control Room packages.....	1307
Working with repositories, credentials and roles.....	1308
Manage user credentials.....	1308
Set up your bot repository.....	1309
Define the roles for your users.....	1309
Create your users and assign their licensed roles.....	1310
Add packages to the Control Room.....	1311
Set up lockers and credentials in Credential Vault.....	1312
Utility for key vault and database authentication configuration.....	1312
Credentials and lockers in the Credential Vault.....	1316
Set up locker and assign credentials.....	1317
Create credential.....	1317
Create locker.....	1319
Credential Vault email notifications.....	1321
Administration.....	1322
User management.....	1322
Roles.....	1329
Settings.....	1350
Licenses.....	1366
Stop and start Control Room services on Linux.....	1367
Control Room log files.....	1368
Add packages to the Control Room.....	1369
External key vault integration CyberArk.....	1370
Bot Store.....	1370
Access Bot Store from the Control Room.....	1371
Submit bots or packages to Bot Store.....	1371
Download bots or packages to the Control Room.....	1372
Getting started with Private Bot Store.....	1373
Set up A-People user access to Private Bot Store.....	1374
Set up SAML user access to Private Bot Store.....	1374
Submit and approve bots using Private Bot Store.....	1375
Submit and manage bot ideas using Private Bot Store.....	1375
Custom filter management in Private Bot Store.....	1376
Bot Lifecycle Management.....	1377
Guidelines for exporting and importing bots.....	1378
Export bots.....	1379
Import bots.....	1380
Control Room APIs.....	1382
Configure the Control Room.....	1383
Audit API.....	1383
Authentication API.....	1388
Bot Scheduler APIs.....	1395
Bot Execution Orchestrator API.....	1402
Bot Insight API.....	1407
Bot Lifecycle Management API.....	1415
Credential Vault APIs.....	1419
Deploy bots using API.....	1428
Device API.....	1432
Device pool API.....	1434
License API.....	1438
Migration APIs.....	1441
Repository Management APIs.....	1462

---

User management APIs.....	1469
Workload Management API.....	1505
Filters in an API request body.....	1524
API response codes.....	1529
Optimize.....	1530
Business analytics through Bot Insight.....	1530
Accessing Bot Insight.....	1531
Access Bot Insight from the Control Room.....	1531
Roles to access Bot Insight.....	1531
Role-based access control in Bot Insight.....	1532
Bot Insight dashboards.....	1533
Using Bot Insight.....	1546
Business analytics.....	1547
Using widgets.....	1548
Adding a dashboard widget.....	1549
Editing a dashboard widget.....	1551
Drilling down information in dashboard widget.....	1552
Renaming a dashboard widget.....	1552
Exporting data from a dashboard widget.....	1553
Data connector for Power BI.....	1553
Deploy Power BI connector.....	1554
Configure Power BI connector.....	1554
Example: Retrieve information in Power BI using business information API.....	1555
Configure Tableau web data connector in Bot Insight.....	1556
Index.....	1557

# Explore

---

Welcome to the Explore pages for Automation Anywhere Automation 360. This collection of topics is designed to introduce you to our latest RPA and Intelligent Automation platform.

## Overview

Automation 360 is the RPA industry's first purely web-based Intelligent Automation platform that is cloud-native. Delivered in the Cloud or On-Premises, Automation 360 is designed for ease of use by all types of users across technical skill levels. The platform enables businesses of all sizes to achieve unprecedented scale with enterprise-class security, data privacy, and reduced time to value and costs of ownership. With Automation 360, businesses can also leverage built-in artificial intelligence (AI) capabilities and easily integrate third-party AI solutions, such as computer vision, natural language processing, and predictive modeling—all with the simplicity of drag-and-drop AI into any automation workflow.

The Automation 360 platform also includes attended automation and plug-ins that enable business users to automate tasks from within their business applications such as Microsoft Excel and Salesforce. This capability makes automation of front-office processes easier, faster, and more cost-efficient.

Automation 360 is available globally and in 10 languages, including English, French, German, Japanese, Korean, Italian, Portuguese, Spanish, Simplified Chinese, and Traditional Chinese.

## Available products

The Automation 360 platform includes the following offerings:

- Automation 360 delivered in the cloud, hosted by Automation Anywhere with no client installation or additional infrastructure required
- Automation 360, the full platform delivered On-Premises
- Automation 360 Free Trial, with 30 days to try the cloud-based offering with full tech support included during the trial period
- Community Edition, a free web-based option for users to experience a wide-range of Enterprise A2019 bot creation capabilities

## More resources

- [Training on Automation 360: \*Get trained and certified on Automation 360 \(A-People login required\)\*](#)
- [Industry first bot security program](#)

## Related concepts

### [Automation 360 Release Notes](#)

Review the new capabilities, changes, fixes (resolved issues), security fixes, deprecated features, and limitations in each release.

### [About Automation 360](#)

The Automation Anywhere Digital Workforce platform is the foundation to deliver the automation of complex business work securely and at scale.

### [Security architecture](#)

Many of the largest financial organizations in the world rely on Automation Anywhere's secure digital workforce platform to automate security-sensitive operations.

**Related information**

[Automation 360 platform](#)

[What is RPA?](#)

[Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#)

## Automation 360 Release Notes

Review the new capabilities, changes, fixes (resolved issues), security fixes, deprecated features, and limitations in each release.

---

**Note:** Enterprise A2019 is now called Automation 360. Although the release notes for releases earlier than Automation 360 v.21 reference the old product name, the content in these releases notes is applicable and relevant to Automation 360.

---

Use the links to view the release notes updates for each release.

**Related concepts**

[Community Edition Release Notes](#)

Review the new capabilities in different Automation 360 Community Edition releases.

**Related reference**

[Automation 360 v.21 Cloud Preview Sandbox Release Notes](#)

[Automation 360 feature comparison matrix](#)

Use the feature comparison matrix to compare the Automation 360 features with the features in Automation Anywhere Enterprise 11.3.x and 10.x versions.

[Automation 360 FAQ](#)

For details and questions on the latest Automation Anywhere platform, Automation 360, review this FAQ.

## Automation 360 v.21 Release Notes

*Release date: 09 June 2021*

Review what's new and changed, and the fixes and limitations in the Automation 360 v.21 release. Build 9637 is for Cloud and Build 9642 is for On-Premises. Automation 360 IQ Bot On-Premises is on Build 9596.

---

**Important:** We have updated the Automation 360 Cloud, On-Premises, and IQ Bot On-Premises builds for fixes.

- Cloud Build 9637 and On-Premises Build 9642 include the following fixes:
    - Control Room fails to retrieve credentials from CyberArk and AWS when Active Directory is configured as authentication type.
    - Bot deployments are getting stuck in a queue after Automation 360 Cloud is updated from the previous release to this release (Service Cloud case ID 00784333, 00784890, 00784382, 00784338).
    - Cloned bots are losing their dependency when they are checked-in (Service Cloud case ID 00780756).
  - The IQ Bot On-Premises build is updated to resolve error messages that were displayed for custom output path during IQ Bot installation (Service Cloud case ID: 00777932, 00766332).
-

- **Migration**

[11.x and 10.x](#) | [11.x only](#) | [10.x only](#)

- **RPA Workspace**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

- **AARI**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

- **Discovery Bot**

[What's new](#) | [Fixes](#) | [Limitations](#)

- **IQ Bot**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

## Updating to this release

You can update to this Automation 360 release from the previous three releases (that is, from  $n-3$  releases, where  $n$  refers to the latest release). The following builds are certified for update to this release:

- Build 8815 (v.20)
- Build 8147 (v.19)
- Build 7560 (v.18)

---

**Recommendation:** If you are not on an  $n-3$  release, update Automation 360 to one of the three certified releases before updating to this release.

See [Update to latest Automation 360 version](#).

---

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

---

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

## Migration features

11.x and 10.x features
<p><b>New system role to perform migration</b></p> <p>Assign the <b>AAE_Bot Migration Admin</b> system role to the user who will perform migration. This role contains all the permissions required to view and manage the bot migration process. Using this role eliminates the manual effort of creating custom roles, selecting the required permissions, and assigning them to the users who perform the migration.</p>
<p><b>Enhanced bot runtime window</b></p> <p>When you migrate bots using the Bot Migration Wizard, the bot runtime window now shows the name of the 11.x or 10.x bot file that is currently migrated.</p>
<p>You can now migrate bots with the <b>Open webpage in a new window</b> and <b>Open a webpage in an existing window</b> settings.</p>

**11.x and 10.x features**

You can now migrate 11.x and 10.x bots with multiple versions of a DLL.

**11.x only features****MetaBot screens: Custom objects and play mode enhancements**

- Custom objects within the Image play mode are now fully supported.
- Linked objects are now captured.

**Enhanced Hide/Show option in Control Room**

For bots available in the Control Room (the `My bots` folder), a filter is available to hide or show older `.mbot` and `.atmx` files displayed in the window.

**Enhanced Database action functionality**

The Database action now supports connecting to Oracle databases using SID and or Service\_name. In previous releases, only connecting with SID was supported.

**New email variable strings**

New email sent and received string variables are available for the Loop, Import DataSet, and Export Dataset actions to insert sent values for date and time.

**Enhanced Microsoft Exchange Web Services support**

The Send function in the Email package supports EWS OAuth2.0, improving backward-compatibility.

**Manually migrate from 11.x to Cloud-enabled environment**

You can now manually migrate from 11.x to a Cloud-enabled environment. In this migration, you must create all the entities such as users, roles, and credentials manually, except bots. All 11.x versions are supported for this migration.

*[Prepare for 11.x to Automation 360 Cloud-enabled migration](#)*

**10.x only features****Migrate MetaBots screen with Password type variable**

You can now migrate 10.x bots based on the MetaBot screen, which uses the **Password** type variable. During the migration, the logic (.logic file) in the .mbot file is migrated as a new TaskBot within the MetaBot folder. Also, the **Password** type variable is migrated as a credential variable and is assigned to a predefined locker.

**Migrate TaskBots based on MetaBot Screen and DLL assets without using Logic**

You can now migrate a TaskBot that references the Run MetaBot action for the MetaBot Screen and DLL assets directly, without using the MetaBot Logic. So you can migrate a TaskBot that contains MetaBot Screen and DLL assets.

## RPA Workspace

What's new
<p><b>Automation 360 navigation enhancements</b></p> <p>We have enhanced the overall readability and accessibility of the Automation 360 interface. To make navigation easier, menus and views are organized based on frequently used features and related tasks.</p> <p>The interface includes the following updates:</p> <ul style="list-style-type: none"> <li>The Device, Profile, and Help icons are now located at the bottom of the navigation menu, consolidating all controls on the left for easy access.</li> </ul> <p>When you click these icons, flyout panels of content and actions are shown.</p> <ul style="list-style-type: none"> <li>The side navigation menu can be collapsed to a slim bar to maximize the main workspace area.</li> </ul> <p>You can continue to use the side navigation in collapsed mode, with flyouts for each section.</p> <p><a href="#">Automation 360 navigation updates</a></p>
<p><b>Authenticate database connection with Microsoft Azure Active Directory credentials</b> (Service Cloud case ID 00676448)</p> <p>You can now authenticate the Control Room database connection using Microsoft Azure Active Directory credentials when you install the Control Room on Microsoft Azure.</p> <p><a href="#">Configure database type and server</a></p>
<p><b>Prioritize your automations</b></p> <p>Set priority on your automation and deployments to meet your business SLA and to optimally use your resources. You can set the preference when you create, edit, and schedule bots so that higher priority automations are deployed first. To run and schedule automations, you must be assigned the permission <b>Set automation priority to high</b> by the Control Room admin.</p> <p><a href="#">Feature permissions for a role</a>   <a href="#">Set automation priority for your bots</a>   <a href="#">Schedule a bot</a></p>
<p><b>Deploy workload automation on a multi-user Windows terminal server</b></p> <p>To optimize workload automation and multi-user devices, you can deploy workload automations on a multi-user Windows terminal server so that a single device can process multiple work items concurrently.</p> <p><a href="#">About multi-user devices</a>   <a href="#">About device pools</a></p>
<p><b>Control Room and Bot agent compatibility checks for automation</b></p> <p>To manage the lifecycle of your automation, you can view dependency information about minimum compatible Control Room and Bot agent versions when you create and deploy automations. You can then update your automation and reduce runtime errors caused by an incompatible Control Room or Bot agent version.</p> <p><a href="#">Actions palette content for bot creation</a></p>

What's new
<p><b>New actions in the SAP BAPI package</b></p> <p>Use the following new actions:</p> <ul style="list-style-type: none"> <li>• <b>Run standard workflow:</b> Runs a standard workflow in SAP BAPI.</li> <li>• <b>Run custom workflow:</b> Runs a custom workflow in SAP BAPI.</li> </ul> <p><a href="#">SAP BAPI package</a></p>
<p><b>New actions in File package</b></p> <p>Use the following new actions:</p> <ul style="list-style-type: none"> <li>• <b>Get name:</b> Reads a file name and stores it to a string.</li> <li>• <b>Get path:</b> Reads the path of the file and stores it to a string.</li> </ul> <p><a href="#">File package</a></p>
<p><b>Common table expression supported in Database package</b></p> <p>You can now use common table expression (CTE) in the <b>Read from</b> action using the <code>WITH</code> keyword in SQL-compliant databases such as Oracle and MySQL. Use CTE statements within a SQL query to simplify complex joins and subqueries.</p> <p><a href="#">Using the Read from action</a></p>
<p><b>Support for large numbers in Number package</b> (Service Cloud case ID:00557619)</p> <p>You can now perform mathematical operations for large numbers with more precision in the Number package.</p> <p><a href="#">Number package</a></p>
<p><b>Snowflake database support using ODBC driver</b> (Service Cloud case ID:00761695)</p> <p>Snowflake ODBC driver is now supported in the Database package. You can connect to the Snowflake database using ODBC-based client applications.</p> <p>The following actions support this feature:</p> <ul style="list-style-type: none"> <li>• Connect</li> <li>• Disconnect</li> <li>• Read from</li> <li>• Export to data table</li> <li>• Insert/Update/Delete</li> </ul>
<p><b>Variables: new features and enhancements</b> (Service Cloud Case ID:00740585)</p> <ul style="list-style-type: none"> <li>• Edit the variable name after the variable is created.</li> <li>• Delete all or a specific selection of unused variables from a bot.</li> </ul>
<p><b>Universal Recorder new features and enhancements</b></p> <ul style="list-style-type: none"> <li>• Record object interactions in applications built on the Electron framework.</li> <li>• Perform double-click in all supported applications and browsers.</li> </ul>

What's new
<p><b>Limit credential attribute use to password fields only</b> (Service Cloud Case ID:00740585)</p> <p>When you create or edit a credential attribute, ensure that bots input the attribute value only in fields that are identified as password fields by selecting the <b>Set this attribute as a password</b> option.</p>
<p><b>Organize device pools to check for available devices in a preferred order</b></p> <p>If you select multiple device pools (either in the <b>Run now</b> or <b>Schedule</b> window), you can now arrange the device pools in the order of preference. When a bot is deployed, the Control Room selects the first available device based on the order in which you organized the device pools. If none of the devices are available at the time of deployment, the bot is queued.</p>
<p><b>Default names for output variables</b></p> <p>When you configure an output variable for the actions in the Error handler and Python Script packages, the Control Room automatically generates a descriptive default variable name. If you create more than one output variable for an action, the subsequent variable names are appended with a -1, -2, -3, and so on to avoid a variable name conflict.</p>
<p><b>New string action to support nested variables</b></p> <p>Use the <b>String &gt; Evaluate value</b> action to compare a user-specified string variable with the string variables in the bot. If a match is found, the action returns the value of the matching variable.</p> <p><i>String package</i></p>
<p><b>Delete Global values</b></p> <p>A user with the <b>AAE_Admin</b> role can delete a global value from the <b>All global values</b> page.</p> <p><i>Global values</i></p>
<p><b>High availability support</b></p> <p>For Cloud-enabled users, high availability is supported through three-node deployments.</p>
<p><b>String package enhancement</b></p> <p>A new option to support local numbering styles is now available in the String package. You can now select your local format, represented by ISO-3166.</p>
<p><b>Dependent files and package information in Export package audit details</b></p> <p>In the Audit details of an exported package, you can now view the list of dependent files and packages associated with the exported package. This feature enables you to analyze what the exported package contains and identify any discrepancies. If you chose to include packages during an export, then only the package information is included in the audit details.</p>
<p><b>ODBC driver support for all connection strings</b> (Service Cloud Case ID: 00748887, 00777676)</p> <p>An Open Database Connectivity (ODBC) driver is now available to support all the ODBC connection strings in the same way it was used in the Enterprise 11.x version. Using SQL as a standard for accessing and managing data, you can connect to MySQL, Google BigQuery, Snowflake, and other databases using the ODBC driver.</p>
<p><b>Share a DLL session</b></p> <p>You can now share a DLL session between bots.</p>

What's new
<p><b>New CredentialAllowPassword annotation</b></p> <p>Use the new <b>CredentialAllowPassword</b> annotation in the package SDK to allow the selection of a credential attribute marked as a password. You can use this annotation when creating a new SDK package or when modifying an existing one.</p> <p><i><a href="#">Configure and use credential allow password annotation</a></i></p>
<p><b>Enhancements to check-in, check-out, and cloning permissions</b> (Service Cloud Case ID: 00645904, 00720237, 00752197, 00760306, 00764684)</p> <ul style="list-style-type: none"> <li>• When performing a check-in, you can now choose the dependencies to check in along with the bot. Directly referenced dependencies will be automatically checked in with the bot.</li> <li>• When a bot is checked in along with a cloned bot and there are no other bots dependent on the clone, the cloned bot is now deleted.</li> <li>• When performing a check-out, you can now choose the dependencies you want to check out with the bot. The dependencies that are not selected during the check-out are now cloned.</li> <li>• During check-out, you can now overwrite or replace a cloned bot.</li> </ul>
<p><b>Bot agent installer includes shortcut for AARI Assistant</b></p> <p>A shortcut to access AARI Assistant easily is added on the desktop and Windows menu when you install a Bot agent.</p> <p><i><a href="#">Install Bot agent and register device</a></i></p>

What's changed
<p><b>Bot Scanner shows invalid bots in "cannot be migrated" list</b></p> <p>The Bot Scanner is updated to show invalid bots as blocked from migration because these invalid bots were failing before and after migration. For example, 11.x or 10.x bots that referenced non-existent variables failed. So some bots will no longer be shown in the <b>can be migrated</b> list of bots but will instead be shown in the <b>cannot be migrated</b> list in the output report. This can decrease the number of bots that can be migrated to Automation 360.</p>
<p><b>Change in names of file locations and folders</b></p> <p>File locations and folder names are now updated for the change in product name (from Enterprise A2019 to Automation 360). For example, the file location for the default installation path is changed from <code>C:\Program Files\Automation Anywhere\Enterprise\</code> to <code>C:\Program Files\Automation Anywhere\Automation360</code>. We will be updating these locations and names on our documentation pages soon.</p>
<p><b>Source string is optional in Split action</b> (Service Cloud case ID: 000687257, 00702258)</p> <p>In bots (including bots migrated from 11.x), when you use the <b>Split</b> action in the String package, the <b>Source string</b> field is now optional. You can run the bot without providing a source string value. Migrated bots that contain empty input strings now execute successfully.</p>

What's changed
<p><b>Mandatory prerequisites validation before migrating bot</b></p> <p>When you migrate bots using the <b>Migrate bots</b> option in the Bot Migration Wizard, a prerequisite validation message appears with a checklist of all the validation items. The system now validates these prerequisites automatically to ensure that all prerequisites are met before you start the bot migration. Previously, validating prerequisites was optional.</p> <p>If the prerequisite validations are completed with a failure, a validation report appears with the list of items for which validation failed. If the prerequisite validations are completed without any failure, the bot migration is started.</p>
<p><b>Change in default Control Room database name</b></p> <p>The default Control Room database name is now changed from <i>AAE-Database</i> to <i>Automation360-Database</i>.</p> <p>If you are upgrading from an earlier release to this release, enter your existing Control Room database name to preserve your data.</p>
<p><b>Microsoft SQL Server clustering for high availability</b></p> <p>You can now use Microsoft SQL Server clustering for automatic and graceful failover of high availability deployments in Control Room clusters.</p> <p><a href="#">Database requirements</a></p>
<p><b>Bot agent nickname is hidden</b></p> <p>The nickname of a Bot agent (added during installation) is now hidden when you switch the registration of a user device from one Control Room instance to another.</p>
<p><b>User interface change in the Open action of Excel packages</b></p> <p>In the Excel basic and Excel advanced packages, the <b>Sheet contains header</b> check box now appears below the <b>Select file</b> field.</p>
<p><b>User interface change in the Variables palette</b></p> <ul style="list-style-type: none"> <li>• The <b>User-defined</b> variables list is now named <b>Your variables</b></li> <li>• System, String, and Clipboard variables are organized within <b>Predefined variables</b></li> </ul>
<p><b>Digits with comma considered a valid number</b> (Service Cloud case ID: 00623458)</p> <p>In migrated bots, a set of digits that uses a comma is now considered a valid number. This change enables you to successfully verify mathematical operations and If, ElseIf, and Loop variable conditions containing various operators.</p>
<p><b>Date comparison works with dates in different formats</b> (Service Cloud case ID: 00723479)</p> <p>Date condition actions are now successfully migrated to the equivalent date conditions in On-Premises. The date condition now works with multiple subformats of the main format (MM/dd/yyyy). Therefore, you do not have to manually change the date format per the source format of the migrated bots that contain date strings.</p>
<p><b>Use string value with numeric operators</b></p> <p>Migrated bots that contain If or While actions that use string values or a variable containing a string value with &lt;, &lt;=, &gt;, and &gt;= numeric operators now run successfully.</p>

What's changed
<p><b>Enhancement to Extract field action in PDF package</b></p> <p>Use the <b>PDF viewer</b> in the <b>Extract field</b> action to extract all the form field data and selected text, and store the form data to variables.</p> <p><i>Using the Extract field action</i></p>
<p><b>Connect automatically to SQL server for Windows authentication</b> (Service Cloud case ID: 00691554)</p> <p>When you upgrade the Bot agent, you no longer have to add <code>d11</code> files manually to connect to the Microsoft SQL Server using Windows authentication.</p> <p>Previously, users had to manually add <code>d11</code> files to configure devices and use the Connect action from the Database package to connect to the Microsoft SQL Server with Windows NT authentication.</p>
<p><b>Enhancement to Active Directory mapping</b></p> <p>You can now create AD groups using commas in the naming on the AD server side and the Control Room side. Previously, this caused an error.</p>
<p><b>Enhancement to the Split action of String package</b></p> <p>Migrated bots now run successfully when the <b>Split</b> action is used to split a string available in an input variable and that variable is empty.</p>

The following table lists the fixes and the builds in which they were fixed. Build 9637 is the latest build for Cloud and includes fixes from the previous builds. On-Premises is on Build 9642.

Fixes		
Build	Service Cloud case ID	Description
9642		Control Room instances configured with Active Directory for authentication with the retrieval of credentials from an external key vault were unsuccessful due to incorrectly prepending domain names in object names (CyberArk) and secret names (AWS) and caused authentication to fail. This issue is now fixed and object names (CyberArk) and secret names (AWS) are now properly formatted.
9637	00784333, 00784890, 00784382, 00784338	Bot deployments are no longer stuck in a queue after Automation 360 Cloud is updated from the previous release to this release.

Fixes		
Build	Service Cloud case ID	Description
9637	00780756	You can now check in bots that have a shared dependency with other bots successfully. Previously, check-in failed because of an issue with the cloned bots losing the dependency during check-in, irrespective of their existing parent bots.
9595	00733638, 00756399	Bots that use a variable to specify the child bot to run no longer encounter an error because the variablized path contains a backslash.
9595	00711390	The retry mechanism now enables you to migrate large .atmx files. Previously, when a large .atmx file was migrated, the connection with the Control Room became stale or unauthenticated, resulting in a <code>NoHttpResponseException</code> error. With the retry mechanism, the Migration utility attempts to build a connection with the Control Room 5 times until the connection is successfully rebuilt.
9595	00730369, 00747866	Recorder actions now work properly, which enable you to run the migrated bot without any delay. Previously, it took a longer time to run the bot due to a long delay.
9595	00733383, 00754559	The Loop counter variable now works properly for migrated bots. The variable is now migrated as part of the <b>XML</b> and the <b>Data Table</b> commands.

Fixes		
Build	Service Cloud case ID	Description
9595	--	When updating the SQL queries on a migrated bot using the <b>Read from</b> and the <b>Insert/Update/Delete</b> actions of the Database package, the existing format of the query is no longer automatically modified. Previously, when editing the SQL queries on a migrated bot, the characters were being misplaced.
9595	00721238	You can now use the <b>Browser</b> action to access a URL with parameters using the Microsoft Edge browser. Previously, when a URL with parameters through the <b>Browser</b> action was accessed using Microsoft Edge, the URL parameters were truncated from the & (ampersand) character after the bot was run.
9595	00721488	11.x bots that use the <b>Get multiple nodes</b> command no longer provide a different output after migration. Previously, the migrated bot returned output per the structure of the XML file, while the 11.x bot provided output in a single line.
9595	--	You no longer encounter an issue when you run bots migrated from 11.x that use identical names for variables differentiated by a hyphen or an underscore (for example, L-Lower and L_Lower). The variable name that contains a hyphen is now appended with some keywords (for example, variable Arr-val is updated to Arr-val-MIG-SPL-25). Previously, bots failed to execute after migration.
9595	00729931	After migration, when the bot file is generated, the correct DOMXPath is now migrated. Previously, an incorrect DOMXPath was migrated.

Fixes		
Build	Service Cloud case ID	Description
9595	00738643	The If and Loop conditions when used in a combination of multiple <b>AND</b> or <b>OR</b> conditions now works properly. Previously, using the If and the Loop conditions with multiple conditions resulted in a bot logic error.
9595	00743808, 00754554	Migrated bots that use the If command with a variable in the HH:MM format now work properly and no longer encounter any issue.
9595	00678059	You can now download exported packages if the bot name contains Japanese characters and an underscore (_). Previously, if the name contained such characters, an unexpected error occurred that restricted the user from downloading the package.
9595	--	When you run a migrated bot that contains the <b>Excel Advanced &gt; Find</b> action, the found cell is now active and subsequent actions can perform operations on that active cell.
9595	00731512	You can no longer edit a bot and change the bot repository file path from the public to private folder by updating the Control Room URL and repository path in the browser.
9595	00734059	INFO type messages are no longer duplicated in the Control Room <code>WebCR.log</code> file.
9595	--	When you install a Bot agent at the user level, the user device is now registered as admin.
9595	00744663, 00747831, 00737488, 00752613	You can now successfully export a bot that contains the Recorder package.

Fixes		
Build	Service Cloud case ID	Description
9595	00726433	Fixed an issue with Microsoft Graph APIs that caused errors when a bot downloaded files from OneDrive. Bots can now successfully run the <b>Office 365 OneDrive &gt; Download file</b> action.
9595	00703553	When a new user is created, the Audit API now returns the correct values for the <b>eventDescription</b> and <b>userName</b> parameters.
9595	00729563	The <code>atmx</code> file extension is no longer case-sensitive. You can now migrate tasks that include uppercase or lowercase letters in their file extensions. Previously, tasks with uppercase letters in their file extensions were not migrated by the Bot Migration Wizard.
9595	00740548	Bot status is now correctly displayed after a process is executed. Previously, scheduled bots were occasionally mislabeled as <code>In progress activity</code> even though the bot had completed the process.
9595	00731508	You can now enter Nordic characters in the credential attribute and credential variable values.
9595	00695176, 00692676	Newly copied bots containing an event trigger now run when the triggering event occurs.
9595	00759742	When you insert a variable in a text string, the variable is now inserted at the cursor position. Previously, the variable was inserted at the end of the string and not at the cursor position.

Fixes		
Build	Service Cloud case ID	Description
9595	--	You can now successfully deploy bots from the Bot editor. Previously, when the Bot Creator or Bot Runner (attended or unattended) user logged in to the Control Room and if the package download option was enabled, the package download took priority and bot deployment had to wait until the package download was completed.
9595	00730211	When you use the Recorder package > <b>Get property</b> action to extract the path property of the object, the recorder now retrieves the value of the height and path attributes of the captured object. Previously, the height and path attributes of the recorded object were not retrieved by the bot.
9595	00716793	An issue is no longer encountered when you execute a bot using the SOAP Web Service package with unformatted input parameters. Previously, bot execution failed with an error because the unformatted input parameters were not formatted in XML format by the bot.
9595	00706709	In the Email package, when you use the Outlook connection to retrieve emails with the date filter, all emails are now retrieved correctly. Previously, all the emails were not retrieved from the application when the date filter was applied.

Fixes		
Build	Service Cloud case ID	Description
9595	00714292	To support double backslashes (\\) in the file location for actions that use file input, you must now set the <b>Bot compatibility version</b> as 2 in the <b>Advanced settings</b> page of the Bot editor. Previously, the bot execution failed because the double backslash (\\) in the file location was replaced with a forward slash when you select a network path using <b>Browse</b> option.
9595	00697460	When you select the recorder in the If condition, the recorder now locates the object in the Oracle EBS application and captures the correct object properties without any error. Previously, the recorder failed to find the object when captured in the If condition.
9595	--	In Microsoft Edge or Firefox, when a bot opens a website inside a loop, the Recorder <b>Capture</b> action now works properly after the launch website operation is executed. Previously, the action failed after launch website was executed.
9595	00710257	In the Recorder package, the <b>Capture</b> action now works without encountering any issues. Previously, the Recorder failed with a timeout error because the network proxy details were not retrieved.
9595	00735480	A TaskBot now performs better when you use the <b>Loop</b> action to execute a bot. Previously, the TaskBot took a long time to complete execution.

Fixes		
Build	Service Cloud case ID	Description
9595	00559868	When you use Datetime package > <b>Assign</b> action to convert a DateTime variable using the custom format dd- <b>MMM</b> -yyyy, the bot now executes without any errors. Previously, the bot execution failed due to case-sensitive characters in the DateTime format.
9595	--	Migration of PaaS database (Azure SQL) connection strings by using an ODBC driver is now supported.
9595	00733651	You can now view the average time spent to create a TaskBot metric in the Control Room on different pages when you click a page number.
9595	00742305	When you turn off one node on a three-node cluster and log in to the Control Room, the following error is no longer displayed: <code>Cluster group is empty.</code>
9595	00712190, 00698197, 00700574	When you deploy a bot with string values that exceed the allowed limit of 2 - 4 MB, the Control Room recognizes it as an exception and now shows the following error message: <code>400 Bad Request.</code>
9595	00754585, 00755448	When you run a bot, dependencies including the child bots are now downloaded. The bot no longer shows an unknown status and session as expired.
9595	--	When you now migrate the Database command, no additional configuration is required.
9595	00745046	You can now check in your bots without encountering any issues. Previously, bot check-in failed because the Git repository was corrupted intermittently.

Fixes		
Build	Service Cloud case ID	Description
9595	00677638	When you add a user device as the default device in the Control Room, the <b>Devices</b> page now automatically displays it as the default device. You no longer have to re-log in to the Control Room or refresh the Control Room page.
9595	00733370	Users signed in to temporary (non-persistent) shared devices can now sign in to the Control Room after a previous session on the temporary device is deleted by the Control Room administrator.
9595	00736950	MetaBots using Japanese characters (double-byte string) as the output variable can now be successfully saved and executed after the MetaBots are migrated to On-Premises using the migration wizard.
9595	00723924	The Terminal Emulator type ANSI now accepts a password that contains braces or {}. Previously, when braces were used in the password, an invalid username and password error message was shown in the terminal screen.

Limitations
<p><b>Known behavior for configured ports on multiple instances</b></p> <p>When you install the Control Room and configure the database, the corresponding configured ports for multiple instances should match. For example, for first instance the configured port is 1434 and for second instance the configured port is 1435, ensure you add 1434 as port for first instance and 1435 as port for second instance.</p>

Limitations
<p>The Universal Recorder has the following limitations when capturing objects in Electron apps:</p> <ul style="list-style-type: none"> <li>The <b>Check</b> action in a check box is not currently supported. <b>Workaround:</b> Use <b>Toggle</b>, <b>Click</b>, or <b>Left click</b> instead.</li> <li>The Universal Recorder cannot capture tabular data. <b>Workaround:</b> When the Universal Recorder captures an object control of <code>Client</code>, select the <b>GetAllChildrenNames</b> action and store the data to a list variable.</li> <li>The Universal Recorder might capture the window containing Microsoft Teams as a Client technology, instead of the intended object. <b>Workaround:</b> Close and reopen Microsoft Teams.</li> <li>The Universal Recorder only supports object capture from Electron apps in a computer that has the display scale configured to 100% or has a DPI awareness setting.</li> </ul>
<p>If the maximum number of allowed activeMQ connections is exceeded, an AMQ failure can occur when running a RunTask automation that is looped 5 times, with each loop running 20+ bots after the fourth loop.</p>
<p><b>External key vault</b></p> <p>The Create/Edit User configure options still include the field permitting the administrator to enter the device credentials for the user. When auto-login is configured for the external key vault, these fields are still viewable and appear editable; however, the credentials added have no effect on the auto-login credential retrieval from the external vault.</p>

## Automation Anywhere Robotic Interface (AARI)

What's new
<p><b>AARI Assistant for attended Bot Runners</b></p> <p>The AARI Assistant application enables users with the attended Bot Runner license to access their bots without logging in to the Control Room. AARI web users can use the AARI Assistant when the attended Bot Runner license is enabled along with their AARI User license without impacting their existing functionality.</p> <p><a href="#">About AARI Assistant</a></p>
<p><b>Download, delete, or view files in browser in initial forms or tasks</b></p> <p>Users can now use the <b>Select File</b> element to download files that are uploaded to the initial forms or tasks, and they can also delete files or access the hyperlink file to view the file in within the browser. The uploaded file can be accessed as a hyperlink, and new icons are available for download and delete.</p>

What's new
<p><b>Enhancement to team roles</b></p> <p>The AARI team consists of three roles:</p> <ul style="list-style-type: none"> <li>• Member: Can create, view, and delete their own requests. All the tasks are automatically assigned to the member when they create the request in a private team. In a shared team, the member can assign tasks to other members.</li> <li>• Owner: Can create, view, delete, and assign all the requests from the members in the team.</li> <li>• Admin: Can create, view delete, and assign all the requests from the members in the team. The admin can also modify the team.</li> </ul> <p>An AARI admin or manager can edit their teams and update their team members' roles. They also have the option to add or remove team members. The AARI manager is the team admin by default when they create a team.</p>
<p><b>Enhancement to creating requests</b></p> <p>A request can now be created either by a user or by a bot in the <b>Edit Process</b> page.</p> <ul style="list-style-type: none"> <li>• Choose the <b>by user</b> option to view the process in the <b>Processes</b> page.</li> <li>• Choose the <b>by bot</b> option so that the request is created either by a bot or by another process using the <b>Process Task</b>.</li> </ul> <p>You cannot view the process or create a request with this option. Because the request is created from within a team, specify the default team in the <b>Default team to take the bot created request</b> field in the <b>Edit Process</b> page.</p> <p><i><a href="#">Assign an AARI team to a process</a></i></p>
<p><b>Assign to me feature in tasks</b></p> <p>When a task is unassigned and users access the tasks, use the <b>Assign to me</b> option to allow the tasks to be assigned to the current user so that they can immediately access the form.</p> <p><i><a href="#">Assign or unassign a task</a></i></p>
<p><b>New Bot page</b></p> <p>When AARI team members with attended Bot Runner licenses access the web interface, they are automatically redirected to AARI Assistant. Users can view all the bots created by them on this page. They can also pin, search, and sort their assigned bots.</p>
<p><b>New team reference in Request and Process pages</b></p> <p>The user can now reference the team from which a request is created by referring to the new <b>Team</b> column in the <b>Request</b> page or the team name added in the process tile in the <b>Process</b> page, to help guide their team assignment.</p>
<p><b>New Request Visibility field</b> (Service Cloud case ID: 00718119)</p> <p>Request visibility enables users to allow or restrict access to a request they created to other team members. When the <b>Request Visibility</b> field is set to <b>Shared</b>, all the requests are accessible by all members, owners, and team admins. If the field is set to <b>Private</b>, the requests are available only to the user who has created the request, owner, and the team admin.</p>

**What's new****Enhancement to the Processes page**

The following enhancements are available on the **Processes** page:

- Sort the processes by name, in ascending or descending order.
- Toggle the pinning of a process.
- Use the responsive view to adjust the display to the screen size.

**Cloud storage usage**

Based on the maximum file and storage sizes, users who upload files can use cloud storage. The quota for storage is as follows:

- The size of the file uploaded using the **Select File** element cannot exceed 25 MB.
- By default, the storage can store a maximum of 100 MB of data.
- It is extended to an additional 1 GB for every AARI user license allocated.

**Copy process to URI feature**

The AARI admin can use the new **Copy process to uri to clipboard** feature in the **Process setup** page to obtain the URI data and share with team members as reference when they enter the URI data to the **Create a Request** action.

[AARI web package](#)

**Add rows from header row context menu**

Only the header row is displayed when a form that has a table is launched during bot runtime. Use one of the following methods to add new rows to the table:

- Header row context menu of the table

[Using the Table element](#)

- The **Set** action in a bot

[Using Set action](#)

**Support for interface triggers on Google Chrome**

Interface triggers are now supported on the Google Chrome browser for the following actions during bot runtime:

- When you click a button element in a form
- For **Got focus** and **Lost focus** actions in a text box
- When a preconfigured hot key is used with the **Got focus** action in a text box

[Add an interface trigger](#)

What's changed
<p><b>Upgrade changes to teams and processes</b></p> <p>For users who had access to processes, when they upgrade to the latest Automation 360 version, their existing teams remain the same but is now set to a <b>shared</b> team type, regardless of their existing team assignment. AARI users and managers, are now converted to <b>member</b> and <b>admin</b> team roles, respectively. While any existing processes assigned to your team are shown as <b>Team Migrated for Process</b> after the upgrade.</p> <p>For AARI managers (process manager) who could create requests without assigning process to teams. After the upgrade, the AARI managers must create teams, ask the AARI admin to assign teams to a process in order to create new requests.</p> <p>Processes have the <b>by user</b> option set by default for teams to view a process. You must choose the <b>by bot</b> option to have request be created by bots or another process.</p> <p><a href="#">Using AARI on the web interface</a>   <a href="#">Assign an AARI team to a process</a></p>
<p><b>Update to Auto Assign feature</b></p> <ul style="list-style-type: none"> <li>In the <b>Human Task</b>, you can no longer use the auto-assign feature to assign the task automatically to the manager. You can auto-assign the task to the user who created the request.</li> <li>The option to assign the target task to the manager is now removed from the <b>Go to</b> element.</li> </ul> <p>You can now override the previous auto-assign setting by selecting the <b>Override task assignment setting</b> option in the <b>Go to</b> panel by either unassigning the task or assigning the task to the user who created the request.</p>

The following table lists the fixes and the builds in which they were fixed. Build 9637 is the latest build for Cloud and includes fixes from the previous builds (including Build 9604). On-Premises is on Build 9642.

Fixes		
Build	Service Cloud case ID	Description
9604	00765406	When you enter more than four number values with a comma in a <b>Number</b> element field in the initial forms or tasks, the field can now accept the large number value without issues.
9595	00719862	In the <b>Team Setup</b> page, you can now view the members of your team and check if the member count is consistent with the number of team members.
9595	00738934	Users can now view, upload, download, or delete their files when they add the <b>Select File</b> element to forms to complete tasks in the web interface.
9595	00767008	When you upload a file with the <b>Select File</b> element in your tasks, the bot now downloads your file through the <b>Get Storage file</b> action without issues.

Fixes		
Build	Service Cloud case ID	Description
9595	--	Long text for the label name of <b>Radio button</b> and <b>Checkbox</b> elements in a form is now displayed completely.

Limitations
<p>When you log in to AARI Assistant application as a non-attended user, it shows an error as expected. However if you use that same credentials, or credentials from another non-attended user, and log in again to the application, it takes you to the web interface page.</p> <p><b>Workaround:</b></p> <ol style="list-style-type: none"> <li>1. Log in to the AARI Assistant application as an attended user.</li> <li>2. First, log in to the web interface (<code>aari/#/assistant</code> URL) then log out without changing anything in the browser. Second, navigate to the AARI Assistant application on your desktop and log in as an attended user.</li> </ol>
<p>The <b>Teams</b> column in the <b>Process setup</b> page is not automatically updated when the AARI admin adds or removes their team in a process.</p> <p><b>Workarounds:</b> Use the following options on the <b>Process setup</b> page:</p> <ul style="list-style-type: none"> <li>• Click the <b>Refresh the list</b> option.</li> <li>• Click the browser's refresh option to reload the page.</li> <li>• Navigate to another tab then return to this page.</li> </ul>
<p>When you use the <b>Process Task</b> in the process editor, you cannot use the <b>Public folder</b> option in the <b>Select process file</b> field because adding a public process as a dependency to the private process is not supported.</p>
<p>When users use the <b>Image</b> element to render images, the images does not render external images in the request view when users run their tasks.</p>

## Discovery Bot

What's new
<p><b>Sort for a process tile from the Processes page</b></p> <p>You can now use the sort field to help you locate a process tile quickly. From the <b>Processes</b> page, use the drop-down menu to sort on a process tile based on the process name in alphabetical order. Alternatively, you can sort in the order of the newest process created to the oldest process and vice versa.</p> <p><a href="#">Create a Discovery Bot process</a></p>

What's new
<p><b>Enhancements to opportunities</b></p> <p>You can now review and analyze automatically generated (or system-generated) opportunities immediately from the <b>Opportunities</b> page. Auto-generated opportunities are created when at least two recordings are approved by the user. You can create a custom opportunity from an auto-generated opportunity and apply the <b>Model</b> and <b>Filter</b> options to target a specific opportunity for automation.</p> <p>You can now prioritize opportunities based on a simple formula for all recordings in a process. From the Opportunities table, you can view the cost without automation and savings for an opportunity. The system automatically calculates the cost and potential savings for each opportunity generated. You can customize these metrics based on your organization's model for cost and savings.</p> <p><a href="#">Review opportunities and convert to bot</a></p>
<p><b>Generated PDD files are available on your local server</b></p> <p>The generated PDD file for an opportunity is now stored locally on your server for On-Premises deployments. The existing PDD files are automatically moved to the new location and are not deleted when a re-installation or upgrade is performed in the Control Room.</p> <p><a href="#">Prerequisites for Discovery Bot</a></p>

Fixes	
Service Cloud case ID	Description
--	Double-click, drag-drop, click and hold, and text select are now supported when you are recording a business process.

Limitations
<p>The Control Room installer for Red Hat Enterprise Linux (version 7.7 or 7.9) does not include the Discovery Bot package.</p> <p><b>Workaround:</b> Log in to the Control Room as an admin, select <b>Manage &gt; Package &gt; Upload</b> and upload the Discovery Bot package. The package is included in the list of default packages.</p>

## IQ Bot

What's new
<p><b>IQ Bot standard forms</b></p> <p>Create learning instances using the standard forms, which use an existing pretrained model and classification for extracting a large number of data fields from structured documents that typically have less or no variations in the layout.</p> <hr/> <p><b>Note:</b> Standard forms are currently available only as a beta feature.</p> <hr/> <p><a href="#">IQ Bot standard forms</a></p>

**What's new****Additional learning instances for IQ Bot Process documents action**

Use the new **Azure 3.2** and **japanese\_Tegaki** learning instances for the IQ Bot **Process documents** action in the IQ Bot Extraction package.

[Using IQ Bot Process documents action](#)

**What's changed****IQ Bot file paths**

File locations and folder names are updated to use the new product name. For example:

- The default installation path is changed from `C:\Program Files (x86)\Automation Anywhere IQ Bot A2019\` to `C:\Program Files (x86)\Automation 360 IQ Bot\`.
- The default log path is changed from `C:\Users\Public\Documents\Automation Anywhere IQ Bot A2019` to `C:\Users\Public\Documents\Automation 360 IQBot Platform`.

**Provider column on Learning Instances page updated**

The **Provider** column in the **Learning Instances > My learning instances** page is now updated to display a list of all available OCR engines associated with the corresponding learning instance.

**Enhancements to IQ Bot Extraction package**

IQ Bot Extraction package now supports the following OCR engines:

- Microsoft Azure Computer Vision OCR engine 3.2  
This significantly improves the OCR extraction from Chinese language documents.
- Tegaki API OCR engine

[IQ Bot Extraction package](#)

**Enhancement to IQ Bot security** (Service Cloud Case ID: 00677507)

You can now further improve security in IQ Bot by configuring RabbitMQ communication through a secure SSL/TLS channel. Set `secureRabbitMQCommunication = true` in the `system.properties` file and then restart all IQ Bot services, including RabbitMQ. By default, this flag is set to `false`.

This enhancement also fixes an issue that caused a RabbitMQ security vulnerability.

**Reuse the name of a deleted learning instance** | Automation 360 IQ Bot On-Premises

While creating or editing a new learning instance, you can now reuse the name of a learning instance that was deleted. Ensure you backup the documents in your **Output** folder before deleting a learning instance. You can then clear the documents of the **Output** folder before creating or editing a new learning instance with the same name.

If you have not cleared the documents from the **Output** folder for the deleted learning instance, you cannot download the contents. However, you can download only the documents processed by the new learning instance.

What's changed
<p><b>Support for Microsoft Azure SMB</b></p> <p>IQ Bot now supports Microsoft Azure files storage system using the SMB (Server Message Block) protocol. You can now also install IQ Bot using the shared folder configured with SMB and access the output files from the same directory.</p>
<p><b>Switch between databases without re-installing IQ Bot</b></p> <p>You can now switch between configured databases without re-installing IQ Bot using the <code>SwitchDBServer.bat</code> utility.</p> <p>To use this utility, perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Download and extract the <code>SwitchDBServer.bat</code> utility from the <code>&lt;IQBot installation Dir&gt;\Configurations</code> folder, and then open the command prompt in this directory.</li> <li>2. Run the batch (.bat) file with an IP address or hostname of the destination DB server.</li> </ol> <p><b>Example:</b> <code>SwitchDBServer 171.xx.xx.11</code></p>
<p><b>IQ Bot Classifierpackage entitlement check</b></p> <p>When you update to this release from an earlier Automation 360 IQ Bot version, IQ Bot Classifierpackage now verifies the license.</p> <p><a href="#">IQ Bot Classifier package</a></p>

The following table lists the fixes and the builds in which they were fixed. Build 9596 is the latest build for On-Premises and includes fixes from the previous build.

Fixes		
Build	Service Cloud case ID	Description
9596	00777932, 00766332	While you update to this IQ Bot release, the output path from the previous version is now retained during installation.
9595	00686444	When exporting learning instances from one environment to another, IQ Bot now updates the <code>visionBotId</code> in the exported data. So you can now edit bots in the destination environment without any errors.
9595	--	Duplicate table row entries in the Validator are now significantly reduced due to the improved table extraction logic.
9595	00651057	IQ Bot can now connect to Control Room Ignite cache without any errors. This fixes an issue where all learning instances were not displayed.

Fixes		
Build	Service Cloud case ID	Description
9595	00616038	When you update or restart Control Room, error messages are no longer displayed when you use the link or click <b>Explore IQ Bot</b> to open IQ Bot.
9595	00668412, 00644948, 00717414	When you now upload a document in production, deadlocks no longer occur in the system and documents are correctly sent to the Validator.
9595	00651572, 00650959	If no files are available in the <code>Output\Successful</code> folder and you click the <b>Download all documents</b> action, IQ Bot now displays the correct error message.
9595	--	Documents in Chinese (Simplified) language are now processed successfully without any issues.
9595	--	If you add a blocked library to a custom Python logic and click <b>Test Run</b> for any field, an error message is no longer displayed on the Designer page.
9595	--	The 11.x IQ Bot command can now be migrated to the <b>Upload Documents</b> action in Automation 360 IQ Bot. Therefore, you no longer have to manually create bots when you migrate the learning instances.

Limitations
<p>After you update to this release, some of the PDF documents that were classified in the earlier IQ Bot release might become unclassified.</p> <p><b>Workaround:</b> Convert the unclassified PDF document to an image file and upload it.</p>
<p>IQ Bot Cloud: If you do not access IQ Bot within the configured <b>Ideal time out</b> value set on the IQ Bot server:</p> <ul style="list-style-type: none"> <li>• A message to restart IQ Bot is displayed.</li> <li>• Bots using IQ Bot APIs fail when the server is restarted.</li> </ul> <p>Refresh the IQ Bot web page after some time (more than 5 minutes) to log in to IQ Bot.</p>

Limitations
<p>When you create a learning instance, if the PDF that you upload contains small fonts, the document is classified as an image. If you use the PDFBox OCR to create a learning instance for a multipage document, the segments are not displayed.</p> <p><b>Workaround:</b> Turn off the PDFBox OCR.</p>
<p>If an incorrect configuration is used to create the <code>providerVersion</code> file of a standard forms learning instance, an error message is displayed when you move this learning instance to production.</p> <p><b>Note:</b> Ensure you use valid configurations.</p>
<p>If you use a bot associated with a standard forms learning instance to upload a large number of documents, some of the documents are not processed.</p> <p><b>Workaround:</b> Because this issue might be caused due to a timeout, try to upload the documents after some time.</p>
<p>If you have used an earlier version of IQ Bot (11.x) to move documents to the <b>Validator</b>, you cannot download these documents when you migrate to this Automation 360 IQ Bot version.</p> <p><b>Workaround:</b> If you are migrate to this version, ensure you clear all the documents in Validator.</p>
<p>When you use the <b>Download all documents</b> or <b>Upload Document</b> actions from the IQ Bot package, the upload and download can fail as the proxy settings specified in the Control Room are not used.</p>
<p>If you manually delete any <code>.csv</code> file from the <code>Success</code> folder, other files in the folder might not be downloaded when you use the <b>Download</b> option.</p> <p>Ensure you do not manually delete any files from the <code>Success</code> folder.</p>
<p>Only SQL authentication is supported when you use the Migration Assistant tool to migrate from IQ Bot 11.x to Automation 360 IQ Bot.</p>
<p>If you have a document with a large number of pages (&gt;100), an error message is displayed intermittently when you click <b>See extraction results</b> for an existing learning instance.</p>

---

**Important:** For information about the packages supported with this release, see [Viewing package versions available in the Control Room](#).

---

## Enterprise A2019.20 Release Notes

*Release date: 20 April 2021*

Review what's new and changed, and the fixes and limitations in the Enterprise A2019.20 release. Build 8846 is for Cloud and Build 8815 is for On-Premises. IQ Bot A2019 is on Build 8815.

---

**Important:** We have updated the Cloud build to include the following fixes:

- Migrated bots failing to execute due to preprocessing error (Service Cloud case ID 00760877, 00761211)

- Unable to deploy bots because the resource path exceeds the maximum length supported by Microsoft (Service Cloud case ID 00764731, 00763373, 00765172, 763334)

---

- **Migration**

[11.x and 10.x](#) | [11.x only](#)

- **Enterprise A2019**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

- **AARI**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

- **Discovery Bot**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

- **IQ Bot**

[What's new](#) | [What's changed](#) | [Fixes](#) | [Limitations](#)

- **Bot Insight**

[What's new](#)

## Updating to this release

You can update to this release from the previous three releases (that is, from  $n-3$  releases, where  $n$  refers to the latest release). The following builds are certified for update to this release:

- Build 8147 (v.19)
- Build 7560 (v.18)
- Build 7103 (v.17)

---

**Recommendation:** If you are not on an  $n-3$  release, update to one of the three certified releases before updating to this release.

See [Update to latest Automation 360 version](#).

---

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

---

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

## Migration features

### 11.x and 10.x features

#### Select folders for migration (Service Cloud case ID: 00689307)

In the Bot Migration Wizard, you can now select folders that contain bots (TaskBots and MetaBots) that you want to migrate to Enterprise A2019. As a result, you no longer have to migrate individual bots from that folder.

**11.x and 10.x features****Migrate MetaBots with screens**

Migrate MetaBots that contain screens as assets. You can migrate screens based on HTML, MSAA, Java, .Net technologies and use credential variables.

**Migrate bots with the following attributes**

- Bots that contain the **IF > Logic successful** or **IF > Logic unsuccessful** command and these commands return a variable as output
- Bots that contain the Run Task command with the **Repeat until I stop it** option to the **Run** action in the TaskBot package
- Bots that use the \$Clipboard\$ system variable as input and output variables to pass the value to the MetaBot logic

**11.x only features****Migrate bots that use SAP BAPI to automate SAP-related tasks**

Migrate bots that use SAP BAPI to automate the SAP-related tasks. The SAP commands are migrated to equivalent actions of the SAP BAPI package, and the username, password, and hostname attributes used to connect to the SAP server in the 11.x bots are migrated as credential variables in Enterprise A2019.

**Retain legacy behavior of \$Excel Cell Row\$ system variable**

Use the **Use "Excel Cell Row" legacy behavior** option in the Bot Migration Wizard to retain the legacy behavior of the \$Excel Cell Row\$ system variable used in bots created in versions earlier than Version 11.3.1 after they are migrated to Enterprise A2019.

**Migrate bots with the following attributes:**

- Bots that use the **Delete** or **Get All Messages** command to delete or download attachment from all emails that use Exchange Web Services (EWS) using OAuth authentication.
- Bots that contain objects captured using the Object Cloning command that are based on Firefox and Silverlight technologies
- Bots that use the **Modify user** command with the **Update Account Options** and the **Change Password** option in the Active Directory command
- Bots that use the **Create user** option in the Active Directory command
- Bots that use the Variable Operation command and the **Decimal configuration** option is selected
- Bots that use the \$AATaskExecutor\$ system variable
- Bots from Version 11.3.5 or later that use the **Get Single Cell** command with the **Specific cell** and **Get Cell Value** options selected to retrieve value from a cell in a Microsoft Excel file.

## Enterprise A2019

What's new
<p><b>Support for IPv6 addresses</b></p> <p>You can install Enterprise A2019 in distributed load balancer cluster mode in an IPv6 network to comply with your organization's infrastructure and information security requirements.</p> <p>The following are not supported:</p> <ul style="list-style-type: none"> <li>• Geo location is not available for IPv6 addresses.</li> <li>• Link-local addresses for IPv6 addresses are removed from the Enterprise A2019 installer's IPv6 list.</li> </ul> <p><a href="#">Configure IP cluster</a></p>
<p><b>Switch device registration between Control Room instances</b></p> <p>You can now switch your device registration between multiple instances of the Control Room without reinstalling the Bot agent. This setting is applicable to single user devices installed at the system or user level.</p> <p><a href="#">Switch device registration between Control Room instances</a>   <a href="#">Switch Bot agent to a different Control Room</a></p>
<p><b>New permission to attest device user name</b> (Service Cloud case ID: 00576058)</p> <p>Use the new permission to assign a default device to a user name to bypass credential validation when you deploy a bot on unattended Bot Runners. The permission is applicable to default device users with an unlocked and active user session.</p> <p><a href="#">Feature permissions for a role</a></p>
<p><b>Resource threshold settings to optimize bot deployments</b></p> <p>Configure resource threshold settings in the Control Room so that the system deploys the next bot only when the system resources on the device are within the specified thresholds. Specify the settings at the Control Room level for all devices, and customize these settings at each device level.</p> <p><a href="#">Customize device settings</a></p>
<p><b>Reduce bot startup time</b></p> <p>You can now reduce the bot startup time using settings in the Control Room to preload the most frequently used packages in the automation on all user devices when they connect to the Control Room.</p> <p><a href="#">Configure package settings</a></p>
<p><b>Express queue in workload automation</b></p> <p>You can now quickly create workload automation queues with default parameters in the Control Room by using the <b>Create express queue</b> option in the <b>Queues</b> page.</p> <p><a href="#">Create express queues</a></p>
<p><b>Group filters for Active Directory users</b></p> <p>You can provide additional filters for the <code>Users</code> directory as part of the <code>um.properties</code> file. As a result, you can filter the security groups that are in the <code>Users</code> directory for role mapping in the Control Room.</p> <p><a href="#">Manage Active Directory role mapping</a></p>

What's new
<p><b>Automate SAP-related tasks using SAP BAPI</b></p> <p>Use the actions available in the SAP BAPI package to automate SAP-related tasks using SAP BAPI.</p> <p><a href="#">SAP BAPI package</a></p>
<p><b>Default names for output variables</b></p> <p>When you configure an output variable for the following packages, the Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</p> <ul style="list-style-type: none"> <li>• Browser</li> <li>• CSV/TXT</li> <li>• Email</li> <li>• Excel advanced</li> <li>• JavaScript</li> <li>• Loop</li> <li>• Recorder</li> <li>• VBScript</li> <li>• Window</li> </ul>
<p><b>PDF split with blank pages supports scanned image documents</b> (Service Cloud case ID: 00683923)</p> <p>Use the PDF <b>Split</b> action to separate a blank page from pages with scanned images. With pixel-based split, you can now use <b>Split document</b> to split a PDF with blank page separators for scanned (image-based) documents.</p>
<p><b>SMTP port range expanded to include ports 1 through 65535</b></p> <p>The Email package now supports ports in the range of 1 through 65535 for the SMTP server. You can use the <b>Send</b> email action by configuring the SMTP port in this range.</p>
<p><b>New actions in the Active Directory package</b></p> <ul style="list-style-type: none"> <li>• <b>Update account options:</b> Sets account attributes for the user.</li> <li>• <b>Change user password:</b> Use this option to change a user's password.</li> </ul> <p><a href="#">User account operations</a></p>
<p><b>Enhancement to Create user action in Active Directory package</b></p> <p>You can now use the <b>Create user</b> action to create an Active Directory user with password.</p> <p><a href="#">Using the Create user action</a></p>
<p><b>Universal Recorder expanded support and new features</b></p> <p>Use the Universal Recorder to perform the following:</p> <ul style="list-style-type: none"> <li>• Automate clicks and data retrieval in drop-down lists and combo boxes in Oracle EBS applications such as Compass.</li> <li>• Link an object that the bot cannot reliably identify to a nearby object (such as a link or button) that is easier for the bot to find. Use this feature in MSAA, UI Automation, or Java applications.</li> </ul>

What's new
<p><b>Support for new languages in variable names</b></p> <p>You can now use Czech, Danish, Dutch, Finnish, French, German, Hungarian, Italian, Norwegian, Polish, Portuguese, Romanian, Spanish, and Swedish characters in variable names.</p> <p><a href="#">Unicode range supported in variables</a></p>
<p><b>Search and add child bot in the parent bot</b></p> <p>Search for a child bot in the public and private workspaces so that you can add it in the parent bot. You can search for the child bot from the Bot editor and the <b>Run</b> action of the Task Bot package.</p> <p><a href="#">Using the Run action</a>   <a href="#">Bot editor for creating bots</a></p>
<p><b>Obtain information about user that deployed the bot</b></p> <p>Use the <code>AATaskInvoker</code> system variable to return the username, first name, last name, and email of the user that ran or scheduled the bot. If the bot is deployed to an attended Bot Runner, this variable returns information about the logged-in user. If the bot is deployed by a trigger, this variable returns information about the user who set the trigger.</p> <p><a href="#">System settings and parameters</a></p>
<p><b>Git restoration enhancements</b></p> <ul style="list-style-type: none"> <li>• If your database is deleted or corrupted, as an administrator you can now restore files from the Git repository to a repository that is not fully empty.</li> <li>• You can also overwrite or skip the files if you have duplicate files in the Git repository.</li> <li>• If you are restoring files in an empty repository, you can choose to use either your existing credentials (configured with Control Room) or the credentials of any other repository.</li> </ul> <p><a href="#">Restore bots from Git repository</a></p>
<p><b>View version history of TaskBots</b></p> <p>You can now view the version history of your TaskBots to identify relevant changes performed by other users to your TaskBots during a specific date and time along with the check-in messages.</p> <p><a href="#">View TaskBot version history</a></p>
<p><b>External key vault support</b></p> <p>Use external key vaults to securely store and retrieve credentials using a third-party key manager such as CyberArk and AWS Secrets Manager.</p>
<p><b>New condition in If package</b> (Service Cloud case ID: 00536088, 00690073,00717514, 00737243, 00702383)</p> <p>Use the new <b>Window with same title does not exist</b> or <b>Window with same title exist</b> condition available in the If package to verify whether a window with the same title exists or whether the window title has changed.</p> <p><a href="#">If package</a></p>

**What's new****Google packages are now generally available**

Google Calendar, Google Drive, and Google Sheets packages are now generally available in Enterprise A2019, with a major change to the authentication method:

- Each Google package contains a **Connect** action to authenticate your account before adding other actions from that package to your automation. This action replaces the deprecated **OAuth** action from the G-Apps package.
- Each Google package contains a **Disconnect** action to terminate the connection.

*[Using the Connect action for Google packages](#)*

**What's changed****Bots wait for Internet Explorer to fully render in Mouse package**

Bots (including bots migrated from 11.x) that use the Mouse package now wait for the Internet Explorer to finish loading the page before executing the **Click** action. This prevents the bots from failing while the page is loading.

**Interface change in the Edit variable window**

When editing a variable, if you deselect the **Use as input**, **Use as output**, or **Constant (read-only)** check box, a message now informs you of the impact of this change and requests you to confirm this update.

**Enhancement to audit log entries** (Service Cloud case ID: 00656155)

The audit log entries are now enhanced to display the **Item Name** and **Event Type** for import, export, check-in, and check-out requests.

**The .atmx file not downloaded during migration**

The migration process does not download the `.atmx` file if the associated bot is used as a child bot in the parent bot. The **Download CR file** action from the File package is no longer added in the migrated bot to download the depended bot (`.atmx`) file during migration.

**Option to either upgrade Recorder package version or downgrade to older Google Chrome extension**

Bots that use the Recorder package version 2.0.5 or older to automate in the Google Chrome browser, now need to be updated to use a Recorder package version that is newer than 2.0.5. This is only necessary for Bot Runner devices that have the new Google Chrome extension (ID:kammdlphdfejllopponbapgbgkimo km) installed, and have not previously run bots that use the Recorder package version 2.0.5 or older.

If you do not want to upgrade the Recorder package, you can manually install the old Google Chrome extension. See *[Google Chrome extension troubleshooting](#)*.

The following table lists the fixes and the builds in which they were fixed. Build 8846 is the latest build for Cloud and includes fixes from the previous builds. On-Premises is on Build 8815.

Fixes		
Build	Service Cloud case ID	Description
8846	00764731, 00763373, 00765172, 763334	You can now deploy bots and dependent files stored in a repository with a file path that exceeds the maximum supported character length (256 characters) for your Windows operating system.
8846	00714248	Only those Bot Runners and Bot Creators expressly configured as credential vault consumers for a given bot can use that bot.
8846	00751728	When you migrate 11.x bots that use the String Operation command with the space character as a delimiter, the extracted value now retains the space and works properly. Previously, after migration, the space from the String Operation command was removed.
8846	00760877, 00761211	Bots that are migrated, modified, and scheduled now successfully deploy without a preprocessing error. Previously, migrated bots failed to execute due to the following preprocessing error: Attribute type ANY is not supported.
8840	00747869, 00750571, 0744918	When you create a bot using a loop with the Recorder Capture action to perform operations on the Chrome browser, the bot now executes without any disruption. Previously, the bot failed to run and displayed an error.
8840	00733635, 00743082, 00750865	When you run a bot that contains the Excel Advanced > Find action, the found cell is now active and subsequent actions can perform operations on that active cell.
8840	00723075, 00717920	When a bot encounters a workbook that contains links to cells in other workbooks, the system suppresses the Excel pop-up message so that the bot can run without interruption.
8840	00746651, 00757879	After migrating bots, you can successfully run the bots without any preprocessing error. Previously, using variables inside brackets failed to process the task.
8840	00742159, 00743092	The Excel Advanced Set cell and Delete cell actions now select the correct cells when the cell address column name contains more than one letter.
8840	00743636	The Excel Advanced Set cell, Delete cell, and Go to cell actions now support all ranges. Previously, the actions encountered errors with ranges greater than AB1:AB100.
8815	00750668	A workload bot is no longer stuck in a queue, and the device does not display a Pick up at run time status.
8815	00733227	Control Room database tables are now created when you use the restored 11.x database while installing Enterprise A2019.
8815	00733720	Bot Migration Wizard no longer encounters an error when processing a large bot for migration. Previously, this issue was encountered when a large bot was downloaded to the Bot Runner device for migration from the Control Room and the connection between the Bot Runner device and Control Room was reset.

Fixes		
Build	Service Cloud case ID	Description
8815	--	Bot Scanner is now updated to include scenarios that were previously failing after migration. As a result, some bots might be moved from the list of bots that <b>can be migrated</b> to the list of bots that <b>cannot be migrated</b> in the output report. This can decrease the number of bots that can be migrated to Enterprise A2019.
8815	00703679, 00711398, 00729399	11.x or 10.x bots that use the string variable or an object captured from Internet Explorer whose property is null or empty no longer encounters an error after these bots are migrated.
8815	00667326	Bot Scanner no longer becomes unresponsive when scanning bots for any of the following reasons: <ul style="list-style-type: none"> <li>• Scanning a corrupted <code>.atmx</code> file of a bot</li> <li>• Bots that contains the If, IF/ELSE, or Loop command and that command is commented out</li> <li>• Bot that contains an object that is captured using the Object Cloning command using the <b>Coordinate</b> play mode and the <b>Click</b> action is performed on that object</li> </ul>
8815	00731068, 00737025	An error is no longer encountered when you run a bot that contains multiple variables that return a number value in the same command after that bot is migrated.
8815	00720261	An error is no longer encountered when you run a migrated bot that contains a special character.
8815	00713303	In a migrated bot that uses the Run Task command, when you run a subtask within the main task and the subtask name contains Unicode characters, the bot now executes successfully without any error. Previously, the bot failed and displayed an error message.
8815	00691133	You can now successfully delete migrated bots in your private workspace without encountering any issue. Previously, an error message was displayed when a migrated bot was deleted in the private workspace.
8815	00736166	Previously, when the migration process was initiated, the process sometimes remained in the <code>In progress</code> status in the Bot Migration Wizard. Now the process starts running.
8815	00730131	Bots that use the Run Script command with the <code>\$Clipboard</code> system variable as an input or output variable no longer encounter errors when you run these bots after they are migrated to Enterprise A2019.
8815	00726833	11.x Work Items and queues that are associated with bots that use the Variable Operation command no longer encounter an error after the first item in the queue is processed successfully after migration to Enterprise A2019.

Fixes		
Build	Service Cloud case ID	Description
8815	--	Bot Scanner no longer encounters an error when scanning MetaBots that contain the Object Cloning command that is commented out and the MetaBot is trying to find the play mode from those commented out commands.
8815	00716557	An error is no longer encountered when you run a MetaBot in Enterprise A2019 that was created in 10.x, migrated to 11.x, and then migrated to Enterprise A2019.
8815	00710569	When you migrate a MetaBot that contains screens as assets from 11.x to Enterprise A2019, Japanese characters in the object properties are now displayed correctly in the migrated bots. Previously, the Japanese characters in the object properties were garbled in the migrated bots.
8815	00702262	The <b>Historical activity</b> page now shows a detailed error message that specifies the cause of the error and the line where the error is encountered for bots that are migrated from 11.x and use the Error Handling command.
8815	00703513, 00708988	Parent bots that use the <b>Run</b> action of the Task Bot package with the <b>Upon error, start next repetition</b> option selected no longer encounter an error if their child bots encounter an error at runtime and do not return the output variable to the parent bot. Previously, parent bots encountered an error if the child bots did not return the output variable to the parent bots because the child bots encountered an error during runtime.
8815	00702601	A bot that uses an array variable that contains a system variable and which returns an integer no longer encounters an error after that bot is migrated.
8815	00707801	You can now migrate a 11.x bot that contains Mouse <b>Click</b> to capture the coordinates of a maximized window. Previously, the bot with a Mouse <b>Click</b> encountered an issue during migration because the window left and top parameters were set to negative values for maximized windows.
8815	00710315, 00728228, 00729082, 00744242	Migrated bots that use the Object Cloning command with legacy technology to capture objects with multiple lines of text now work properly, without any issues.
8815	00716650	When you migrate a 11.x bot that contains an Excel command with two Excel sessions in it, the <b>Get column name</b> or <b>Get row number</b> actions now displays the correct values in the output. Previously, the actions set the wrong session values in the migrated bot if it contained two Excel sessions.
8815	00711148	Enterprise A2019 installation no longer fails if there is a space in the data and log path (for example, D:\Automation Anywhere\ProgramData). And, the following error message is no longer displayed: Control Room database tables fail to create.

Fixes		
Build	Service Cloud case ID	Description
8815	00708902	You can now use the Google Drive package to upload files in the Google Shared Drive. Use only the <b>Folder ID</b> option to upload files to a shared folder in the drive and enter the ID of the shared folder. Previously, an error occurred when a user tried to upload a file in the shared folder in the Google Drive.
8815	00735479	When you create a bot that has a dependency with a long repository path that exceeds the maximum limit of 256 characters and when you run the bot on the Bot Runner machine, the bot now displays a message, prompting you to reduce the length of the file path. Previously, the bot execution failed without any message providing the reason for the failure.
8815	00727406	You can now successfully send an email in HTML format with an HTML attachment using the <b>Email server</b> . Previously, when an email was sent in HTML format along with an attached HTML file, the email body content and the content of the attached file were merged. As a result, only the attachment was seen in the mail without the body content.
8815	00707734	In the App Integration package, when you use the <b>Capture text of window</b> action in a Japanese browser, the window title now displays properly for Japanese language. Previously, the output was not displayed correctly in the Japanese text format.
8815	00699149,00707670	You can now use the <b>Unzip</b> action of the Folder package and execute your bots on a Windows 10 server. Now, if two Windows users with different device credentials try to deploy a bot on the same machine, the deployment does not fail. Previously, if a user deployed the bot on the same machine with a different user profile, the bot failed to execute.
8815	00695224, 00730472, 00739431	When you use the <b>Find Image in a Window</b> action in the Image Recognition package, image files are now deleted from the Temp location and storage space is freed after bot execution. Previously, the image files were not deleted from the Temp location and as a result disk storage ran out of space.
8815	00709162	The CSV/TXT <b>Open</b> action now works without encountering any issue even if there are blank values in the last row of the .txt file. Previously, if there were blank values in the last row of the file, the bot encountered an issue.
8815	00711124	In the Email package, when you use the <b>Connect</b> action, add a loop, and select <b>For each in mail box to read emails</b> as the <b>Iterator</b> option, a new line is no longer deleted and correctly displays the email content. Previously, the new lines were deleted when the mail was sent and received in plain text format.
8815	00673049	In the SAP package, if an error is encountered when the <b>Connect</b> action is used to connect with a SAP system, the error is now captured in the <b>Try</b> and <b>Catch</b> blocks. Previously, the connection issue was not captured in the <b>Try</b> and <b>Catch</b> blocks in the action.

Fixes		
Build	Service Cloud case ID	Description
8815	00697215	A bot now executes successfully when you use the <b>Throw</b> action with an expression. Previously, when an expression such as <code>\$number.ToString\$</code> was used in the <b>Exception message</b> field of the <b>Throw</b> action, the bot encountered a preprocessing error.
8815	00714260	Runtime errors are no longer displayed when you use the following: <ul style="list-style-type: none"> <li>• A MetaBot with run DLL migration function that takes more than one parameter type as Array or any type other than String</li> <li>• A TaskBot with run logic calling a child bot that takes more than one input parameter of type Array, which is mapped to a List variable in the parent bot run logic migration function</li> </ul>
8815	00704547	The <b>Pause</b> action of the TaskBot package now works properly when you use it as the last task in the bot. Previously, the bot did not wait for the task to complete if the <b>Pause</b> action was used as last task in the bot.
8815	00675344	A TaskBot now performs better when you use the Terminal Emulator <b>Send text</b> and <b>Send key</b> actions to execute a bot. Previously, the TaskBot took a long time to complete the execution.
8815	00699650,00716648	When you use Image Recognition actions to execute a bot and if the bot fails during execution, the captured source and target images are stored in <code>C:\ProgramData\AutomationAnywhere\BotRunner\Logs\IR</code> with a maximum of 10 source and target image pairs. Now, when the maximum limit is reached, the oldest image pairs are overwritten with new images. Previously, the image logs were not overwritten.
8815	00716817	A bot now executes successfully when you use the PDF <b>Extract text</b> action to extract structured text from PDF files. Previously, bot execution failed to extract structured text if it contained Thai characters.
8815	00717204	You can now use a credential from the Credential Vault in the <b>URI</b> field of the REST Web Service actions.
8815	00682726, 00678580, 00695359, 00684985	You can now use the Universal Recorder to automate in Oracle Fusion Middleware applications. Previously, an issue with the Java API caused the Recorder to select the entire window instead of the specific object.
8815	00693770	Fixed an issue where numbers extracted from an SQL database to a data table variable were automatically converted to scientific notation.
8815	00669959	You can now select the same start date and end date when you schedule bots with the <b>Run repeatedly</b> option ( <b>Activity &gt; Scheduled &gt; Schedule bot</b> ) in the Control Room.

Fixes		
Build	Service Cloud case ID	Description
8815	00702841, 00700915	Disconnected devices are now displayed in the Control Room ( <b>Devices &gt; My Devices</b> ) when you filter the devices list by <b>Status</b> as <b>Disconnected</b> .
8815	00707318, 00711529	Work items in an active queue are now processed and you no longer have to delete the active queue and create another queue after you upgrade from a previous release to this release.
8815	00705046	Bots that include embedded dependent files instead of a zipped folder are no longer queued intermittently for deployment on Bot Runner devices.
8815	--	Disabled tenant IDs or removed tenants that are later reused on the same deployment with a different tenant might produce a licensing error. This conflict is now removed and deboarded tenants in later reuse no longer generate the error.
8815	00685926	When you import an exported bot into the private workspace and check in the imported bot, the bot is now checked in successfully without any issues. Previously, the check-in failed due to a metadata validation error.
8815	00682025	When a bot or a file is modified in the public workspace, the cloned dependent file in the private workspace now reflects the changes and the bot executes successfully. Previously, the cloned dependent file did not reflect the changes and the bot execution failed.
8815	00726018	The Google Drive <b>Upload file</b> action now uploads files to subfolders.
8815	00715080, 00731152	You can now perform concurrent unattended bot deployment on a multi-user device with multiple user sessions running simultaneously.
8815	--	A non-admin Bot agent user now remains connected to the Control Room and is not disconnected frequently.
8815	00709737	Actions in the Google Sheets package now support worksheets that contain empty cells.
8815	00710354	A hibernate exception error is no longer displayed when you log in to the Control Room as an admin user.
8815	00732178	You can now check out bots from folders with similar names but in different letter cases and edit the bots in your private workspace in the Control Room.  For example, if there is a folder named <code>Automation1</code> in the public workspace and a folder named <code>automation1</code> folder in the private workspace, you can now check out bots from the <code>Automation1</code> folder in the public workspace.

Fixes		
Build	Service Cloud case ID	Description
8815	--	Bots are now deployed on a multi-user device in a non-admin user session when another admin user session is also active on the device if auto-login setting in the Control Room is set to lock the session after the bot finishes executing from an existing unlocked session.
8815	00719407	During a cluster installation of Enterprise A2019 on Red Hat Enterprise Linux, the installer now uses the same user ID across all cluster nodes.
8815	00703325	The log file permission for an Control Room installed on Linux now maps to the crkernel user. Previously, it was mapped to the root user.
8815	--	When you access the Control Room with the <b>Login with Windows</b> option selected, you must now enter the FQDN to log in successfully.
8815	00732141, 00722919, 00743006	When you preload a package, after the download is complete, the completion status updates in the <b>Activity &gt; Historical activity</b> page and the pending record is no longer displayed in the <b>Activity &gt; In progress</b> page.
8815	00731376	When you migrate MetaBot logic, if there is case mismatch in the variable name and the mapping variable, variables are no longer created twice. As a result, a preprocessing error does not appear when you execute the task.
8815		Now, the migration of run logic with CV variables is supported.
8815		Now, when using the <b>Date</b> system variable in the <b>File</b> folders command, a migrated bot is no longer failing.
8815		When migrating bots (v11.x to A2019) with OC properties more than 64KB, such properties will be truncated and the bot will be migrated.

Limitations
<p>When you create a bot with <b>Open</b> and <b>Close</b> browser actions in a loop and select the <b>Window</b> option to close the selected tab, an error might occur when you execute the bot.</p> <p><b>Workaround:</b> Use the <b>Close</b> action of the Window package instead of the <b>Close</b> action in the Browser package to close the window.</p>
<p>If you deploy bots using event triggers, and you install the Bot agent on a device as a non-admin user for self or a local admin user, the Bot agent will not be updated automatically. The device is will be shown as disconnected in the Control Room.</p> <p><b>Workaround:</b></p> <ol style="list-style-type: none"> <li>1. End the trigger listener Java process (javaw.exe) from the Task Manager.</li> <li>2. Re-install the Bot agent to reconnect the user device in the Control Room.</li> </ol>

Limitations
Configuring multiple IP addresses for Control Room nodes in a cluster is not supported during installation in On-Premises deployments. You must manually configure the primary IP address in the <code>cluster.properties</code> file. <a href="#">Add primary IP address for cluster</a>   <a href="#">Configure additional IP address for a new cluster node</a>
Bot deployment on multi-user sessions is not supported for workload automation.
Using an Enterprise A2019.20 SDS On-Premises Control Room with an Enterprise A2019.19 SDS Cloud Control Room is not supported.
When you run a bot containing a <b>Capture</b> action that uses the anchor object feature, your device DPI settings must match the settings at which you configured the anchor object.
The Control Room does not allow hyphens and underscores to be used interchangeably when creating and calling global value names.
When you migrate a 11.x bot that uses Object Cloning command with Silverlight technology and execute that bot in Enterprise A2019, the bot might fail with an error due to a play reliability issue. The same play reliability is also seen in 11.x when you use Object Cloning command with Silverlight plugins.
For actions that use file input, when you select a network path using <b>Browse</b> , bot execution fails because the double backslash (\\) in the file location is replaced with a forward slash. <b>Workaround:</b> Do not use the <b>Browse</b> option to select the file location. Instead, manually enter the complete file path.
When a Bot Creator, attended Bot Runner or unattended Bot Runner user logs in to the Control Room from their Bot agent machine and if the package download option is enabled, the package download takes priority, and bot deployment waits until the package download is complete. This occurs only when the package is downloaded for the first time.
When a bot runs an automation in the Microsoft Internet Explorer browser, the Microsoft API responsible for the browser delay might encounter an exception, causing the bot to fail and a Chrome-related error message to appear in the Control Room.
(Service Cloud case ID: 00712808) Automation Anywhere related files are sometimes generated in <code>C:\Windows\Temp</code> . These files can be safely deleted.
For 11.x bots that contain an object that is captured using the Object Cloning command using the <b>Image</b> or the <b>Coordinate</b> play mode, the <b>Set Text</b> is performed on that object and the credential variable is used to set text for the object. The credential variable for these bots is not migrated when the bots are migrated to Enterprise A2019.

## Automation Anywhere Robotic Interface (AARI)

What's new
<p><b>Get Storage file action</b></p> <p>The new <b>Get Storage file</b> action in the <b>AARI Web</b> package enables you to download storage files to a bot device.</p> <p><a href="#">AARI web package</a></p>

What's new
<p><b>Upload files in initial forms or tasks</b></p> <p>Add the <b>Select File</b> element to forms to enable users to select and upload files in the initial forms or tasks in the web interface. Users can browse to upload a new file or replace an existing file. The uploaded file is shown as a hyperlink and redirects users to a new tab when opened.</p> <p><a href="#">Configure processes</a></p>
<p><b>Hyperlinks support for initial forms or tasks</b></p> <p>Use the new <b>Hyperlink</b> element to add links to forms and access them in initial forms and tasks.</p> <p><a href="#">Configure processes</a></p>
<p><b>Configure a scheduler user for each process</b> (Service Cloud case ID: 00713786)</p> <p>As an AARI administrator, you can now configure a scheduler user for each process to allocate the Control Room resources (devices and unattended Bot Runners) on the web interface. By default, the <b>Global scheduler</b> user is selected if a scheduler user is not configured for individual processes.</p> <p><a href="#">Configure scheduler user for AARI on the web</a></p>
<p><b>Update to properties panel for human task</b> (Service Cloud case ID: 00718109)</p> <p>As a Bot Creator, you can choose to not configure any actions in the human task by selecting the <b>Make the form read-only</b> check box in the <b>Properties</b> panel. The human task does not require any input and it is executed automatically to the next task.</p>
<p><b>Bookmark any page as landing page for AARI on the web</b></p> <p>The web interface is now enhanced to a new multiple page system so that you can directly bookmark any page (<b>Requests</b>, <b>Tasks</b>, or <b>Recycle Bin</b>) as your landing page. Also, the tabs in the web interface have been removed so that the requests are opened one at a time and not simultaneously. To perform multiple tasks, you can open the requests pages in different browser tabs.</p>
<p><b>Navigation enhancement in AARI on the web</b></p> <p>The web interface is now enhanced with a side navigation pane so that you can easily navigate to various pages (<b>Processes</b>, <b>Requests</b>, <b>Recycle Bin</b>, and <b>Tasks</b>).</p>
<p><b>New processes page</b> (Service Cloud case ID: 00694786)</p> <p>As an AARI user, navigate to your assigned processes and create new requests by using the new <b>Processes</b> page in the web interface. Use the navigation bar to quickly access the page.</p>
<p><b>Enhancements to the Button element</b></p> <ul style="list-style-type: none"> <li>• Use the <b>Disallow button click when this form is first loaded</b> option to disable the <b>Button</b> element in a form when it is displayed for the first time during bot runtime.</li> <li>• Use the <b>Subtle</b> option in the <b>Button type</b> drop-down menu if you want the button element to appear as a link during bot runtime.</li> </ul> <p><a href="#">Using the Button element</a></p>

What's new
<p><b>Enhancement to the form logo</b></p> <p>You can now use the <b>Logos in footer</b> field option to select up to two separate logos that are displayed in the footer of the form during bot runtime.</p> <p><a href="#">Create a form</a></p>

What's changed
<p><b>Enhancement to the delete process</b></p> <p>An AARI administrator or a user with the <b>Delete from Public</b> permission can now delete a process in the public workspace. When the process is deleted from the public workspace, it is removed from the process management page in the web interface. Additionally, if the process is already assigned to any AARI user or team, access is removed after the process is deleted.</p> <p><a href="#">Delete an AARI process</a></p>
<p><b>Variable selector window update</b></p> <p>The variable selector is now organized by <b>Variable Source</b>, <b>Variable Type</b>, and <b>Variable</b> sections. The variable source contains a request or task. The variable type is now an interface option for you to select an input, output, or meta types. The variable option specifies the variable names and type.</p>
<p><b>Request variable source</b></p> <p>The variable selector now enables users to select a <b>Request</b> variable source with an <b>Input</b> (previously <b>InitialData</b>) and <b>Meta</b> variable types.</p> <p><a href="#">Create an AARI process</a>   <a href="#">AARI variable types</a></p>
<p><b>Insert variables to existing text</b></p> <p>You can use the variable selector in the process editor to insert or add variables without replacing the existing texts.</p> <p><a href="#">Create an AARI process</a></p>
<p><b>Filter update</b></p> <p>In the web interface, when you filter or search for keywords, the filter user interface now updates and reflect the filter criteria accordingly. For example, if you search for the ending status of requests, the filter shows <code>Status: Pending</code>.</p>

Fixes	
Service Cloud case ID	Description
00702607	If you have a <b>Message box</b> action within a trigger loop, you can now use the <b>Run from here</b> option to run the bot without any error messages.
00725237	Error messages are no longer displayed when the <b>Dropdown</b> element in the form is populated with dynamic values during bot runtime.

Fixes	
Service Cloud case ID	Description
00733978	Forms with read-only elements can now be submitted successfully without any issues when the value of the form field exceeds 100.
-	If you select any of the <b>Advance behavior</b> options in the <b>Dropdown</b> element, error messages are no longer displayed during bot runtime.
--	A <b>Bot Task</b> can now pass data to the next task ( <b>Human Task</b> or <b>Bot Task</b> ) if it contains Japanese characters in its output variable name. Previously, English characters had to be used for the variable name in the <b>Bot Task</b> .
--	In a cloud environment, the AARI web interface now displays the correct screen for the selected locale. Previously, the screen was not displayed correctly for the selected locale.

Limitations
<p>In the process editor, the <b>If/Else</b> condition of string type does not allow the source and target values to be empty. As a result, you cannot validate if a string variable is empty.</p> <p><b>Workaround:</b> Create an empty string output variable for the bot. Use this variable as the target value to compare with a form or bot source variable so that the validation in the <b>If/Else</b> condition does not fail.</p>
<p>When you enter data in a form of your process that contains a hyperlink, the data is ignored when you try to submit the form. The hyperlink instead displays the following behaviors:</p> <ul style="list-style-type: none"> <li>• When the hyperlink URL is configured at a designed time (the process of designing the interface or setting properties), the URL remains unchanged by the process.</li> <li>• When the hyperlink URL is not configured at a designed time, then the URL is set to the Control Room domain.</li> </ul>

## Discovery Bot

What's new
<p><b>Search for a business process from the Processes page</b></p> <p>You can now use the search field to help you locate a specific process by name. The field is not case-sensitive. The search field is available from the <b>Processes</b> page.</p> <p><a href="#">Create a Discovery Bot process</a></p>

What's new
<p><b>View all captured images from the screenshot modal window</b></p> <p>You can now navigate across all captured screenshots when you click an image in full size from the modal window. Click the pagination located below the image to select a step number or use the right or left arrows to quickly display all captured images.</p> <p><a href="#">Record a Discovery Bot business process</a></p>
<p><b>Process Discovery package is included in default packages</b></p> <p>The Process Discovery package is now included in the default packages. You can preload the default package when you connect to your device. Preloading the package helps to speed the start time of the recorder the first time you begin recording a process</p> <p><a href="#">Prerequisites for Discovery Bot</a></p>
<p><b>Recorder enhancements</b></p> <p>You can now perform actions such as double-click, drag-drop, click and hold, and text select when recording a business process. Actions performed using keyboard strokes are displayed in the <b>Data</b> field. Double-click is captured by the recorder and displayed in the screenshot from the <b>Recordings</b> page.</p> <hr/> <p><b>Note:</b> The Discovery Bot recorder does not capture the drag-drop and click and hold actions from the <b>Recordings</b> page. To include these actions performed during the recording, you can document the individual steps in the <b>Step description</b> text field for the analyst.</p> <hr/> <p><a href="#">Record a Discovery Bot business process</a></p>
<p><b>Support for IPv6 addresses</b></p> <p>IPv6 addresses are now supported for Discovery Bot.</p>
<p><b>Linux support</b></p> <p>Discovery Bot is now supported on Red Hat Enterprise Linux and Linux CentOS platforms.</p> <p><a href="#">Installing Control Room on Linux</a></p>
<p><b>Support for high availability</b></p> <p>Discovery Bot now supports high availability deployment.</p> <p><a href="#">High availability deployment</a></p>
What's changed
<p><b>Changing default repository path for custom installation</b></p> <p>For custom installation, you can now change the default repository path location to a new location on your server after installation.</p> <p><a href="#">Prerequisites for Discovery Bot</a></p>

Fixes	
Service Cloud case ID	Description
--	You can now export a PDD for an opportunity with 2000 steps by using the <b>Download PDD</b> option from the <b>Opportunities</b> page.

Limitations
When <b>Tab</b> is used to move across fields to a password-type field, the entered data is displayed as clear text, for example, when you move from the <b>Username</b> to <b>Password</b> field. Review the text in the <b>Data</b> field for confidential information before you submit the process.
Some actions might not be supported during a recording session, for example, when you click through the Network tab in Inspect mode using Chrome. For such unsupported actions, pause the recorder, complete the action, and then resume the recording.
When you record a process with 1000+ steps, the <b>Recordings</b> page takes some time to load. <b>Workaround:</b> Depending on your environment, you can perform one of the following actions: <ul style="list-style-type: none"> <li>• Split the recording into multiple recording sessions. For example, you can divide 1000 steps into 10 separate recordings.</li> <li>• Wait for all the steps to load on the page before submitting the process for review.</li> </ul>

## IQ Bot

What's new
<p><b>Enhancement to the IQ Bot Classifier package</b></p> <p>The <b>Train Classifier</b> action now provides an option to retrain the documents using an existing model file.</p> <p><a href="#">Using Train Classifier action</a></p>

What's changed
<p><b>IQ Bot Pre-processor actions renamed</b></p> <p>The names of all the available actions in the IQ Bot Pre-processor package are now changed. For example, the <b>Get barcodes</b> action is now renamed as <b>GetBarCodes</b>.</p> <p><a href="#">IQ Bot Pre-processor package</a></p>
<p><b>Download all processed documents without any timeout</b> (Service Cloud case ID: 00587817)</p> <p>You can now download all your processed files from the Amazon S3 server to your local machine without causing any timeout, irrespective of the number of files. Even when you choose the <b>Delete files from the server after downloading</b> option and if your download fails, a compressed .zip file containing the failed documents is available for downloading again.</p> <p><a href="#">Download all documents action</a></p>

What's changed
<p><b>Enhancements to IQ Bot APIs</b> (Service Cloud case ID: 00688683, 00688678, 00688675)</p> <ul style="list-style-type: none"> <li>• File upload API now returns the file ID of the uploaded file.</li> <li>• File status API now accepts a file ID and returns its status as a status code.</li> <li>• File download API now returns the extracted data in JSON format for a successfully uploaded file.</li> </ul> <p><i><a href="#">Using APIs to upload files, check file status, and download CSV files (A-People login required)</a></i></p>
<p><b>IQ Bot license renamed</b></p> <p>The license required to run IQ Bot is now renamed to <b>IQBot Platform</b> from the previous <b>Cognitive Platform</b>.</p> <p><i><a href="#">Licenses overview</a></i></p>

Fixes	
Service Cloud case ID	Description
00708806	You can now save documents of up to 20 MB after validating, without any issues.
00662968	Fixed an issue that caused the gateway service to become unresponsive.
00644948	When you now upload a document in production, deadlocks no longer occur in the system and documents are correctly sent to the Validator.
00707965	When you now migrate from IQ Bot 11.x to A2019 using the Migration Assistant tool, all database tables are correctly migrated, without any errors.
00715124	IQ Bot now deletes temporary files downloaded from Amazon S3 server in the C:\windows\temp\ folder when they are no longer required. As a result, storage is no longer consumed by these temporary files.
--	Logs are now available for the IQ Bot node servers in the C:\Users\Public\Documents\Automation Anywhere IQBot Platform\Logs\ folder.
--	IQ Bot now displays the correct error message when you refresh the extraction results page for a learning instance when its associated bot is moved to production.

Fixes	
Service Cloud case ID	Description
--	<p>When creating a table on the Designer page, if you click <b>See Extraction results</b> without completing the table creation, the correct error message is now displayed.</p> <p>Previously, the following incorrect message was displayed: Preview will be opened in a new tab.</p>
--	<p>When a bot is deleted and you click the <b>Test bot</b> option on the Bots listing page, the following correct error message is now displayed: Bot not found.</p>
--	<p>Python logic is now correctly applied on all the tables. Previously, IQ Bot failed to execute Python logic for tables other than the default one.</p>
--	<p>You can view more granular logs for troubleshooting RabbitMQ issues. These logs are now stored in the <code>C:\Users\Public\Documents\Automation Anywhere IQBot Platform\Logs\RabbitMQ</code> folder, depending on the log level, log size, and the rotation limit.</p> <p>If any error occurs in the RabbitMQ connection, those crash logs are stored in <code>C:\Users\Public\Documents\Automation Anywhere IQBot Platform\Logs\RabbitMQ\log</code> folder.</p>
--	<p>When you now create a user role with 2-byte non-English characters, services no longer fail to execute.</p>
--	<p>If there is an existing database, IQ Bot installer now does not check for the <code>db_creator</code> role for that user.</p>
--	<p>A user with <code>AAE_IQ Bot Validator</code> role and <code>AAE_Basic</code> role can now successfully launch and validate documents in the IQ Bot Validator.</p>

Limitations
IPv6 addresses are not supported for IQ Bot, so ensure that you use IPv4 addresses only.
If you try to apply Python logic to a linked column between two tables, an error message is displayed for the linked column in the second table and the applied logic fails.
<p>If you add a blocked library to a custom Python logic and click <b>Test Run</b> for any field, an error message is displayed on the designer page.</p> <p><b>Workaround:</b> Remove the blocked library from the Python logic.</p>

Limitations
If you use the <b>Overwrite</b> option to import a learning instance, all the available bots and groups are imported.
When you use the <b>Process documents</b> action from the IQ Bot Extraction package to run a bot through WLM, the <b>Current Action</b> tab displays <code>Downloading additional resources</code> along with your command instead of <code>IQ Bot extraction</code> in the <b>In progress activity</b> page.
Average processing time increases when you use the IQ Bot Extraction package on a document with more than 30 pages.
Running existing bots that use the IQ Bot Pre-processor package might fail after you upgrade to this release. <b>Workaround:</b> Because the names of the available actions in the IQ Bot Pre-processor package have changed, delete the existing actions in the bots and update them with the new names before running the bot.
(Service Cloud case ID: 00601790) You cannot register IQ Bot when the Control Room is installed on a Linux machine.
If you use the <b>File Download API</b> option, the <code>json</code> response you receive does not have a valid format. <b>Workaround:</b> This issue occurs because the <code>:</code> (colon) is replaced by <code>=</code> (equal sign) in the <code>json</code> key value. After you receive the <code>json</code> response, use these options: <ul style="list-style-type: none"> <li>• Replace <code>=</code> with <code>:</code></li> <li>• Add <code>"</code> (double quotation marks) in each text</li> </ul>

## Bot Insight

What's new
<p><b>AAE_Admin role access to operations API from Power BI connector</b></p> <p>The Power BI connector now provides the <b>AAE_Admin</b> user role access to the <code>botrundata</code> operational API. With this role, you can connect to the <code>botrundata</code> API and extract operational metrics to be analyzed and visualized within Power BI.</p>
<p><b>Enhancements to the publish (production) dashboard</b></p> <p>Users with the <b>AAE_Bot Insight Admin</b> and <b>AAE_Bot Insight Expert</b> role can now edit the published dashboard. You can use the save as option to save the production dashboard as a custom production dashboard and add widgets to your custom dashboard. You can also delete a default production dashboard and a custom production dashboard.</p> <p><a href="#">Save a published dashboard</a>   <a href="#">Delete a published dashboard</a></p>

---

**Important:** The supported packages information is moved to this topic: [Viewing package versions available in the Control Room.](#)

---

# Enterprise A2019.19 Release Notes

*Release date: 11 February 2021*

Review the new features, changed features, fixed features, security fixes, deprecated features, and known limitations in the Enterprise A2019.19 release. Enterprise A2019.19 Build 8147 is available for On-Premises and Build 8145 is available for Cloud. IQ Bot is on Build 8098.

**Important:** We have updated the Enterprise A2019.19 builds to include fixes for the following issues:

- System variables that are displaying blank in the action field (Service Cloud case ID 00737695, 00737698)
- Editing the table size when creating a new table variable in On-Premises (Service Cloud case ID 00725978, 00727695, 00736105)
- Issues editing a bot in the Bot editor and opening the packages listing page that includes special characters (Service Cloud case ID 00733529, 00739634)
- Assigning a bot from the private workspace to a file variable (Service Cloud case ID 00727695)
- Actions in the Image Recognition package not allowing the use of files with .PNG extension and files with uppercase letters in the extension (Service Cloud case ID 00734972, 00734266)
- Variable names in uppercase changing to lowercase, hyphen changing to underscore, and variable not being displayed if it contained an uppercase character (Service Cloud case ID 00734784, 00734842, 00734999)
- Bots not getting deployed on a multi-user device when the user session is signed out and no active session existed (Service Cloud case ID 00727228, 00722888, 00732830, 00732835, 00733877, 00733362, 00726489, 00733070, 732959, 733160, 733269,733321, 733391, 733435, 733438, 733451, 733680, 733765, 733770, 733790, 733940, 00734067)
- Child bots encountering an error if they contained the **Find window in window** action of the Image Recognition package (Service Cloud case ID 00727031, 00730358, 00733607, 00733544, 0073464)
- Use of variables with camel case names in the Data Table, List, and Loop packages (Service Cloud case ID 00733263,00733459, 00733007, 00733988, 00734168, 00733141, 00733074, 00733087, 00733001,00734019)

For more information, see the *Fixed features* sections for Enterprise A2019 and AARI.

- [Migration features](#)
- [Enterprise A2019](#)
- [AARI](#)
- [Discovery Bot](#)
- [IQ Bot](#)
- [Bot Insight](#)

## Migration features

### 11.x and 10.x features

#### Review messages in Migration Assistant

The Migration Assistant displays review messages for migrated bots. Open the migration assistant for a bot to review messages for that bot.

[View changes to migrated bots using Migration Assistant](#)

11.x and 10.x features
<p><b>Migrate MetaBots with screens</b></p> <p>Migrate MetaBots that contain screens as assets. You can migrate screens based on UI Automation technology and captured using the <b>Object</b> play mode.</p> <p><i>How MetaBots are migrated</i></p>
<p><b>Review messages in Bot Scanner report</b></p> <p>The Bot Scanner report shows review messages about the behavior change in commands that are used in bots that can be migrated to Enterprise A2019.</p> <p><i>Analyze reports</i></p>
<p><b>Stop, or pause and resume migration</b></p> <p>You can stop, or pause and then resume the migration process from the bot launcher and the <b>Activity &gt; In progress</b> page.</p> <p><i>Stop bot migration   Pause and resume bot migration</i></p>
<p><b>Migrate bots that use capture scrollable text action in App Integration command</b></p> <p>11.x and 10.x App Integration commands that capture text from an application window with a vertical scroll bar are migrated to the <b>App integration &gt; Capture scrollable text</b> action in Enterprise A2019.</p> <p><i>Package mapping for migration</i></p>

11.x only features
<p><b>Map output of PDF integration command to multiple variables</b></p> <p>The output of a 11.x bot that uses the PDF integration command is mapped with multiple variables in the equivalent actions of the PDF package after the bot is migrated to Enterprise A2019.</p>
<p><b>Migrate bots that use the following attributes:</b></p> <ul style="list-style-type: none"> <li>• Bots that send Japanese text in the VT100 terminal using the <b>Send Text</b> command</li> <li>• Bots that use the <b>Get Single Node</b> or the <b>Get Multiple Nodes</b> command to extract nodes that contain namespaces from an XML file</li> <li>• Bots that contain the <b>Connect</b> command of the Terminal Emulator command and the value in the <b>Wait Time Out</b> field that is less than hundred milliseconds</li> </ul>
<p><b>Migrate bots that use the following options in the Active Directory command:</b></p> <ul style="list-style-type: none"> <li>• The <b>Modify Object</b> command with the Rename, Delete, Move, and Set Property actions for the <b>Computer</b> and <b>Organizational Unit</b> object type.</li> <li>• The <b>Modify Group</b> command with the <b>Add users to a group</b> and <b>Remove users from a group</b> actions.</li> </ul> <p><i>Package mapping for migration</i></p>

**10.x only features****Migrate latest version of 10.x bots enabled with version control**

You can now migrate the latest version of bots from your 10.x Control Room configured with SVN version control to Enterprise A2019. Use the **Copy 10.x data** option to copy the latest version of the 10.x bots to Enterprise A2019 and then use the Bot Migration Wizard to migrate the bots to Enterprise A2019.

[Copy 10.x data](#) | [How 10.x data is copied to Automation 360](#)

## Enterprise A2019

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

**New features****Auto-login settings**

Use the auto-login configuration in the Control Room to reduce bot startup time by reusing an existing user session. Configure auto-login in the **Administrator** settings for all devices or customize it from the **Devices** page for each device.

- Configure the auto-login settings for a user session to create a new session or reuse an existing session
- Keep user sessions unlocked
- Log off from a user session after the bot completes execution

[Configure auto-login settings](#) | [Devices](#)

**New CPU utilization and device memory settings**

Configure the CPU utilization and device memory threshold value in the Control Room settings to determine whether to deploy bots on devices or not.

[Configure threshold settings for user devices](#)

**Install Bot agent on devices without administrator privileges**

You can now choose to install the Bot agent on user devices with either local user privileges (without administrator privileges) at the local user level or administrator privileges at the system level.

[Install Bot agent and register device](#) | [Create device pools](#) | [User management](#)

When you install the Bot agent at the user level, the device will not be available as a default device for another user or for device pool selection during bot deployment. For more information, see [Bot agent known limitations](#).

<p><b>New features</b></p>
<p><b>New diagnostic utility for Bot agent</b></p> <p>Use the Bot agent diagnostic utility to perform diagnostic checks on Bot Runner devices and to resolve Bot agent connectivity issues.</p> <p><i>Perform Bot agent diagnostic checks</i></p>
<p><b>New features in Data Table package</b> (Service Cloud case ID: 00656843, 00707635)</p> <ul style="list-style-type: none"> <li>• Use the <b>Change column type</b> action in the Data Table package to perform operations on the column of a data table. Use this action to change the column data type to <b>Boolean</b>, <b>Datetime</b>, <b>Number</b>, or <b>String</b>.</li> <li>• Sort the data in the data table in <b>Number</b>, <b>Datetime</b>, <b>Boolean</b>, or <b>String</b> format.</li> </ul> <p><i>Data Table package</i></p>
<p><b>New action in App Integration package</b></p> <p>Use the <b>Capture scrollable text</b> action to extract text from the selected window or any control within the selected window and save it to a variable. If you click any control within the window, then text from that specific control is extracted. If you click outside the window, then all the text from that window is extracted.</p> <p><i>App Integration package</i></p>
<p><b>New encoding combo box option in Terminal Emulator for VT Series</b></p> <p>To send and receive Japanese text, you can now use the <b>Encoding</b> and <b>CodePage</b> combo boxes when you connect to the Terminal Emulator for the VT series terminal type.</p> <p><i>Using the Connect action</i></p>
<p><b>New actions in Active Directory package</b></p> <p>Use the following actions in the Active Directory to automate a task:</p> <ul style="list-style-type: none"> <li>• Move a computer <i>Using the Move computer action</i></li> <li>• Move an organizational unit <i>Using the Move organizational unit action</i></li> <li>• Add users to a group <i>Using the Add users to group action</i></li> <li>• Remove users from a group <i>Using the Remove users from group action</i></li> </ul>
<p><b>New system variable for new line character</b> (Service Cloud case ID: 00669232, 00672775, 00673578)</p> <p>Use the \$String:Newline\$ system variable to add a new line character. This variable adds a new line character in various applications regardless of the operating system of the device.</p>
<p><b>Zero-size form for Enterprise A2019</b> (Service Cloud case ID: 00677611)</p> <p>The <b>Run</b> action uses the zero-size form with name <code>AAZeroSizeForm</code> that can be used by DLLs to identify zero-size forms created by Enterprise A2019.</p>

New features
<p><b>Enhancement to define parent path in Active Directory</b></p> <p>When you establish a connection with an LDAP server, you can now select the LDAP path by connecting to the server.</p> <p><i><a href="#">Using the Connect action</a></i></p>
<p><b>Obtain information about Run-As user after bot deployment</b></p> <p>Use the <code>AATaskExecutor</code> system variable to return the username, first name, last name, and email of the user that ran the bot. If the bot is deployed on an attended Bot Runner, this variable returns information about the logged-in user. If the bot is deployed by a trigger, this variable returns information about the user associated with that Bot Runner license.</p> <p><i><a href="#">System settings and parameters</a></i></p>
<p><b>Enhancements to the Recorder</b></p> <ul style="list-style-type: none"> <li>• Universal Recorder now supports object capture in Mozilla Firefox. You must install the A2019 extension from Mozilla Firefox browser add-ons.</li> <li>• Capture table, grid view, and main window objects from SAP applications.</li> </ul> <p><i><a href="#">Universal Recorder supported applications and browsers</a>   <a href="#">Actions performed on objects captured with Universal Recorder</a></i></p>
<p><b>Multi-user device supported on Citrix Windows 10 Enterprise</b> (Service Cloud case ID: 00526001)</p> <p>Multi-user device sessions are now supported on Windows 10 Enterprise on Citrix, enabling multiple users to access the same device at the same time.</p>
<p><b>Event triggers on unattended Bot Runners</b> (Service Cloud case ID: 00681548)</p> <p>Ensure that you select the <b>Reuse an existing session</b> option for auto-login settings in the Control Room to use event triggers on unattended Bot Runners when a device is locked or is in a disconnected state (such as RDP).</p> <p><i><a href="#">Configure auto-login settings</a></i></p>
<p><b>Auto Login support on Citrix VDI</b> (Service Cloud case ID: 00680200)</p> <p>Auto Login is now supported on Citrix VDI, which enables bot deployment in unattended mode.</p> <p><i><a href="#">Configure auto-login settings.</a></i></p>
<p><b>Restore bots from Git repository</b></p> <p>If your database is deleted or corrupted, the admin user can restore all your bots and the associated dependent files from the Git repository to your new empty database.</p> <p><i><a href="#">Restore bots from Git repository</a></i></p>
<p><b>Bot Deploy API checks for available devices in the order of listed pool IDs</b></p> <p>If you enter multiple pool IDs in the request body, the API checks the pools for available devices in the order that you listed the pool IDs. If none of the devices are available at the time of deployment, the automation is queued.</p> <p><i><a href="#">Deploy bots API</a></i></p>

Changed features
<p><b>Enhanced security for multi-user Bot agent devices</b> (Service Cloud case ID: 00695858)</p> <p>The Bot agent configured on multi-user devices for RDP-based deployments now uses the updated version of <code>wfreerdp.exe</code> for enhanced security.</p>
<p><b>Deployment API enhancement</b> (Service Cloud case ID: 00655548)</p> <p>When you invoke a regular deployment API, if a RunAsUser is being used to deploy a bot, the deployment API will not deploy other bots until the RunAsUser is free to run the other bots.</p>
<p><b>Status change initiates workload automation deployment</b></p> <p>When you change the status of a Work Item from <b>Failed</b> to <b>New</b> in the Control Room (<b>Queues</b>), the deployment of a workload automation in queue is initiated.</p>
<p><b>Install Google Chrome Enterprise extension offline with Bot agent</b> (Service Cloud case ID: 00623511, 00689623, 00715413)</p> <p>You can now install the extension for Google Chrome Enterprise offline from the Bot agent setup and MSI files.</p>
<p><b>ANSI as default encoding in Data Table package</b></p> <p>For text write operations, Data Table package &gt; <b>Write to file</b> action supports ANSI as default encoding type.</p> <p>Bots created in the previous version of Enterprise A2019 with UTF-8 is not impacted by this change.</p>
<p><b>Enhancement to PDF package</b></p> <p>In the PDF package, when you enter an incorrect page range in the <b>Page range</b> field and execute the bot, an error message is now displayed, requesting you to provide the correct page range. The message is displayed for the following actions:</p> <ul style="list-style-type: none"> <li>• Merge document</li> <li>• Split document</li> <li>• Extract text</li> <li>• Extract image</li> </ul>
<p><b>Bots wait for Google Chrome web page to load</b></p> <p>When automating a task in the Google Chrome browser, bots now wait up to 30 seconds for the web page to load, and then run the subsequent <b>Recorder</b> &gt; <b>Capture</b> action. When the page loads, bots search for the object for the duration specified in the <b>Wait for control</b> field. Waiting for the web page to fully render increases the bot's ability to identify the target object in the web page.</p>
<p><b>Enhancement to desktop operations</b></p> <p>When you create a bot and select an option for desktop operations, the data selected from the drop-down list now persists even when you navigate to other fields.</p>
<p><b>Flow view updates in the Bot editor</b> (Service Cloud case ID: 00701626)</p> <ul style="list-style-type: none"> <li>• The <b>Flow</b> view is disabled when you create or edit a bot and the bot exceeds 500 lines of code. Use the <b>Show list view</b> option to navigate to the list view.</li> <li>• In the Bot editor <b>Flow</b> view, a warning message is displayed when the bot exceeds 400 lines of code or if the bot has more than 100 variables.</li> </ul>

The following table lists the fixed features and the builds in which they were fixed (Build 8147 is the latest build, and builds 8145, 8134, 8122, and 8098 are the previous builds). These fixes are cumulatively available in the latest build.

Fixed features		
Build number	Service Cloud case ID	Description
8147	00737695	When you insert a system variable into an action field, the variable now appears in that field.
8147	00725978, 00727695	When you create a table variable in On-Premises, the table expands to the full size of the window. Previously the table only showed three rows at a time.
8147	00733529,00739634	You no longer encounter any issues when you edit a bot in the Bot editor and open the packages listing page. Previously, if an installed package had an object name with a space ( ' ') character in it, the package listing page displayed an error.
8145	00727695	You can now assign a bot from your private workspace to a file variable.
8145	--	When you create a variable in an action, the variable automatically appears in the field for which you created the variable.
8145	--	You can now use .png files in actions in the Image Recognition package.
8145	00734972, 00734266	You can now select a Control Room file with uppercase letters in the file extension in the <b>Image Recognition &gt; Find image in window</b> action.
8145	00734784	Variables names are now displayed correctly in the Bot editor List view; uppercase letters in the variable name are no longer changed to lowercase letters and hyphens are not changed to underscores.
8145	00734842, 00734999	Actions now display Boolean, date time, or list type variables if the variable name contains uppercase letters.
8145	00727228, 00722888, 00732830, 00732835, 00733877, 00733362, 00726489, 00733070, 732959, 733160, 733269, 733321, 733391, 733435, 733438, 733451, 733680, 733765, 733770, 733790, 733940, 734067	You can now deploy bots on a multi-user device when the user session is signed out and no active session (signed in, locked, or disconnected) exists either for that user or any other user. The following error message is no longer displayed on the <b>View historical activity (Activity &gt; Historical)</b> page: Unable to perform auto-login for user <username>.

Fixed features		
Build number	Service Cloud case ID	Description
8145	--	The Cloud migration utility no longer keeps running in the background if you close the utility when the 11.x data is being uploaded.
8134	00727031, 00730358, 00733607, 00733544, 00734642	You can now successfully execute bots when you use Image Recognition with the <b>Find window in window</b> action in a child bot. Previously, bot execution failed when you used Image Recognition with this action in the subtask.
8134	00733263,00733459, 00733007, 00733988, 00734168, 00733141, 00733074, 00733087, 00733001,00734019	The Data Table, List, and Loop packages now support variables with camel case names.
8122	00713867	Variables are now listed in alphabetical order in the Variables palette and in the <b>Insert a value</b> window that appears when you press the F2 key.
8122	--	The Control Room now does not take time to launch, and the following error message is no longer displayed: <code>An Unexpected Problem Occurred.</code>
8098	00689022, 00697417, 00697420, 00697079	A Bot agent device no longer disconnects from the Control Room that is configured on Microsoft Azure. The following error message is no longer displayed: <code>disconnecting due to outstanding pong.</code>
8122	00719167, 00721731	Tasks such as scheduling bots and connecting to user devices are not delayed in an Control Room hosted on Cloud.
8098	00626595, 00680433	The actions in the Image Recognition package no longer return an incorrect error message about the target image data type.
8098	00698201	Fixed an issue where bots were stuck in the preprocessing mode when the bot was used as a child bot in several running bots or was deployed back to back using the Deploy API. Now bots are deployed from the cache and fewer calls are made to the database, thus avoiding a database deadlock.
8098	--	The Bot Scanner now displays the correct message for the MetaBot logic that contains credential variables that cannot be migrated to Enterprise A2019.

Fixed features		
Build number	Service Cloud case ID	Description
8098	00687223	A 11.x bot that passes a blank value as an input to the string, list, one-dimensional array, and two-dimensional array of string type variable used in a DLL no longer encounters an error when you run that bot after migrating to Enterprise A2019.
8098	00677231	A bot is no longer unresponsive if it contains an action to close the Google Chrome browser followed by an action to open the Google Chrome browser.
8098	00687207	When a 11.x bot contains objects captured using the Object Cloning command and that object has a property that contains an expression within the \$ character, the 11.x bot no longer encounters an error after migration.
8098	00689286	The Bot Scanner no longer encounters an error when you scan a 11.x bot that contains the If command with the <b>Windows control</b> condition selected and is automating a task on a Microsoft Excel file.
8098	00706438	An error is no longer encountered when you are installing Enterprise A2019 and: <ul style="list-style-type: none"> <li>You are migrating from 11.x to Enterprise A2019</li> <li>Active Directory is configured on the 11.x Control Room</li> <li>The restored 11.x database contains the <b>AAE_Meta Bot Designer</b> role</li> </ul>
8098	00708522	An error is no longer encountered when you clone a dependent file of a 11.x bot after it is migrated to Enterprise A2019. The error is encountered only when the migrated bot contains a null description.
8098	00626664	You can now migrate bots that automate tasks in BMC applications. The migrated bots use the <b>Legacy automation &gt; Manage web controls</b> action to automate interactions with objects.
8098	--	You can now select the regular expression <b>Case insensitive</b> option in actions that contain a window title field and successfully perform a recapture in the application window.

Fixed features		
Build number	Service Cloud case ID	Description
8098	00688134	In the Database package, Korean characters are now displayed properly when you use the <b>Insert/Update/Delete</b> action in an Excel file. Previously, the Korean characters were not displayed properly when the action was used.
8098	00675749	In the Email package, you can now forward an email using groupId or Alias. Previously, the mails were not sent by the SMTP server if the email address contained groupId or Alias in the <b>To address</b> field.
8098	--	You can now use a double backslash (\\) in the <b>Send text</b> action of the Terminal Emulator and execute bots. Previously, when a double backslash (\\) was used in this action and the bot was executed, the terminal displayed a single slash (\).
8098	00688692	When you connect to the EWS server to read mails using Loop, the retrieved email now displays the content correctly per the selected mode (HTML or plain text formats). Previously, when connecting to the EWS server to read an email in HTML format, the email body displayed a blank output.
8098	00659456	In the Loop package, when you select <b>For each file in folder</b> as the <b>Iterator</b> option, the <b>Note</b> below the <b>Assign file name and extension to this variable</b> field now displays the key name in English. Previously, the key name in the <b>Note</b> was translated to the languages you selected.
8098	--	A bot no longer runs intermittently when the focus changes from one window to another window and does not display the Type_015 Google Chrome plug-in error.
8098	00683528	In the Database package, single entries are now inserted in the database when you execute a store procedure to add rows in the table and the option <b>Export data to CSV</b> is selected. Previously, duplicate entries were added in the database.
8098	00693664	Fixed an issue where Japanese characters did not display correctly when input into a field that contained a variable.

Fixed features		
Build number	Service Cloud case ID	Description
8098	00677167	The locker <b>Participants</b> tab now shows only the assigned participants for that specific locker. Previously, the tab displayed the participants of the previously viewed locker, requiring the user to refresh the browser to see the correct participants.
8098	--	The Control Room services can now be run using the non-administrator service account users. The <code>Bad Gateway</code> error message is no longer displayed.
8098	00691232	Fixed an issue that did not allow users to update the value of a file type input variable after saving the bot.
8098	--	The <b>Save</b> option is now correctly enabled when users make any changes to the metadata, unique entity, or SAML assertion mode.
8098	--	The username is no longer saved in the login window after the user logs out unless the user has selected the <b>Remember my username</b> option.
8098	00682021	When you check in a bot that has cloned bots as dependencies, the dependent files are no longer lost from the private workspace. Also, after the check-in, if you create a new bot using the same dependencies as in the earlier bot, the new bot executes successfully.
8098	--	Work Items are now processed for workload automation after you add more Work Items to an existing queue.
8098	--	Work Items are now reprocessed for workload automation after you change the status from failed to new.
8098	00711410	You can now migrate workload automations in an Control Room configured to use a manual mode for Credential Vault.
8098	00667047, 00673289	Auto-login for a user session no longer fails for bots deployed on virtual machines when the VDI session is disconnected or is in a locked state, and the following token error message is no longer displayed: <code>An attempt was made to reference a token that does not exist.</code>
8098	00560593, 00585092	Universal Recorder is now aligned with the Bot agent, so the recorder can capture objects on devices with any proxy server configuration.

Fixed features		
Build number	Service Cloud case ID	Description
8098	00675695	When you use the Excel advanced package, the bot now opens an Excel file without any issues. Previously, the bots failed to open an Excel file in some scenarios due to internal hardware components.
8098	00678567	CSV formulaic entries are no longer permitted in data fields of web applications, such as device names. These fields are limited to accept alphabetic characters, numbers, hyphen, and underscore entries only.
8098	00691551	Turkish characters are now supported in user names.

Known limitations
<p>When you update the Bot agent from user level to system level, the user is unable to capture objects using recorder actions or from a window list in a Google Chrome browser.</p> <p><b>Workaround:</b> Remove the registry entry for the user. Ensure the registry entry is in HKLM: <code>Computer\HKEY_CURRENT_USER\SOFTWARE\Google\Chrome\NativeMessagingHost\Automation*</code>.</p>
<p>When you uninstall the Bot agent, the Bot agent service and registry entry are not removed. Therefore, subsequent Bot agent installations fail.</p> <p><b>Workaround:</b></p> <ol style="list-style-type: none"> <li>1. Stop the Bot agent service from the Task Manager.</li> <li>2. Delete the Bot agent registry key from <code>Computer\HKEY_LOCAL_MACHINE\SYSTEM\ControlSet001\Services\Automation Anywhere Bot Agent</code>.</li> <li>3. Reinstall the Bot agent.</li> </ol>
<p>When you install a Bot agent at the user level, the user device is not registered as admin.</p> <p><b>Workaround:</b> Before installing the Bot agent, ensure that the user has write permission to the user profile folders (for example, <code>C:\Program Files</code>).</p>
<p>When you deploy a bot using a custom package and if the package has an object name with a semicolon (;) or percentage (%) character in it, the bot execution fails.</p> <p><b>Workaround:</b> Do not use special characters such as a semicolon (;) or percentage (%) in the custom package name.</p>
<p><b>Limitation for multi-user deployments with auto-login</b></p> <p>If the auto-login setting in the Control Room is set to lock the session when the bot finishes executing from an existing unlocked session, deployments will fail when you deploy a bot on a multi-user device with non-admin user session and another admin user session is also active on the device.</p> <p><b>Workaround:</b> Restart the Bot agent service from the Windows Task Manager and log off from the admin user session.</p>

Known limitations
<p><b>Bot agent installation</b></p> <p>Starting from this release, when you install the Bot agent at the local user level, keep the following in mind:</p> <ul style="list-style-type: none"> <li>• You cannot install the Bot agent at the user level if you log in to the device as the root administrator.</li> <li>• Auto-login is not supported for local users and unattended Bot Runners.</li> <li>• The auto-update feature for the Bot agent will be applicable from the subsequent release because the option to install the Bot agent at the local user level is introduced in this release.</li> <li>• You cannot configure multi-user devices.</li> <li>• Enterprise A2019 recorders for third-party applications: <ul style="list-style-type: none"> <li>• No separate setup is required for JRE 6 and 7.</li> <li>• Citrix XenApp is not supported because administrator privileges are required to set up Citrix.</li> <li>• You must upgrade to the Enterprise A2019.19 Recorder package to use Discovery Bot.</li> <li>• You must have write permission to AISense Recorder logs.</li> </ul> </li> </ul>
<p>Bots encounter a Java heap space error when they use the Excel basic package to open an Excel file that is 20 MB or larger.</p> <p><b>Workaround:</b> Increase the Java virtual machine heap space to 8 GB:</p> <ol style="list-style-type: none"> <li>1. Navigate to <code>C:\Program Files\Automation Anywhere\Bot Agent\config</code>.</li> <li>2. If it does not already exist, create a new text file named <code>nodemanager.properties</code>.</li> <li>3. Open the file and copy the following text and paste it in the file: <code>bot.launcher.jvm.options=-Xmx8092m</code></li> <li>4. Open Windows Services and restart the Bot agent.</li> </ol>
<p>Bots wait a maximum of 30 seconds for an object to appear in the Google Chrome browser, regardless of the value in the <b>Wait for control</b> field in the <b>Recorder</b> &gt; <b>Capture</b> action.</p>
<p><b>Limitations in Cloud migration</b></p> <ul style="list-style-type: none"> <li>• The backup of the 11.x data created by the Cloud migration utility is not deleted when you close the Cloud migration utility after the 11.x data is uploaded to Cloud.</li> <li>• 11.x bots that contain Japanese characters in their name encounter an error when you run these bots after they are migrated to Cloud.</li> <li>• The Cloud migration utility does not show a validation error when you run the utility and the Automation Anywhere Control Room Reverse Proxy service is running if you have reinstalled 11.x Control Room using the same database that you have used in the previous 11.x instance.</li> </ul>
<p>(Service Cloud case ID: 00737669) When you upgrade to this release, the Bot agent is also updated. As a result, all the event triggers associated with Bot Runner (attended or unattended) users are stopped.</p> <p><b>Workaround:</b> Bot Runner (attended and unattended) users must re-login to the Control Room to activate the associated event triggers.</p>

Known limitations
<p>11.x bots that use identical names for variables that are differentiated by a hyphen or an underscore (for example, L-Lower and L_Lower) encounter an error when you run them after migrating to Enterprise A2019.</p> <p><b>Workaround:</b> Update the name of one of the variables to a different name before migrating the bot.</p>
<p>String system variables do not function in Email action fields when the format is set to HTML.</p> <p><b>Workaround:</b> Use HTML tags that perform the same function as the string variables. For example, instead of <code>String:Enter\$</code> or <code>String:Newline\$</code>, you can use the HTML tag <code>&lt;br&gt;</code>. Similarly, for the string variable <code>String:Tab\$</code>, you can enter <code>&amp;nbsp;</code>.</p>
<p>When you insert a variable into an action field that contains other content, the variable appears at the end of the content, regardless of the cursor position.</p> <p><b>Workaround:</b> Highlight the variable name, and then cut and paste it to the correct position in the action field.</p>

## Automation Anywhere Robotic Interface (AARI)

New features
<p><b>New filter task in the process editor</b></p> <p>In the process editor, the <b>Filter Task</b> enables users to filter variables such as human or bot task output with a specific filter criterion.</p> <p><a href="#">Create an AARI process</a></p>
<p><b>New process task in the process editor</b></p> <p>Use the new <b>Process Task</b> option in the process editor to call a subprocess within the main process. This feature enables you to separate tasks into different processes instead of including all the tasks in a single process. Multiple teams can now work at the same time on different tasks within the main process and remain segregated, without any conflicts.</p> <p><a href="#">Create an AARI process</a></p>
<p><b>Hide a task or view a hidden task</b></p> <p>With a Bot Creator license, you can now perform the following:</p> <ul style="list-style-type: none"> <li>Hide the display of human and bot tasks by selecting the <b>Hide this task after completion</b> option in the process editor.</li> <li>View a hidden human or bot tasks by selecting the <b>View hidden tasks</b> option in the tasks view page.</li> </ul> <p><a href="#">Create an AARI process</a></p>
<p><b>Edit title in process editor</b></p> <p>Users can now edit the title in the process editor.</p>
<p><b>Rich-text editor updates (web interface)</b></p> <p>In the web interface, you can use rich-text editor features such as bold text, italics, underline, alignment, formatting, color, and size in tasks.</p>

New features
<p><b>Table element updates (web interface)</b></p> <p>In the web interface, the <b>Table</b> element now supports the use of date, number, drop-down, and text values in tasks.</p>
<p><b>Updates to elements in form builder</b></p> <p>The form builder now includes the following new elements:</p> <ul style="list-style-type: none"> <li>• <b>Select Folder</b> element: Add an upload folder option in the form. <i>Using the Select Folder element</i></li> <li>• <b>Hyperlink</b> element: Assign a URL in the form. <i>Using the Hyperlink element</i></li> </ul>
<p><b>Enhancement to the Checkbox action trigger</b></p> <p>If a form with a <b>Checkbox</b> element is used within a trigger loop package, you can now use the <b>Value selected</b> and <b>Value unselected</b> trigger actions. <i>Trigger loop package</i></p>

Changed features
<p><b>Create and view requests (AARI manager)</b></p> <p>An AARI manager can create and view requests from processes that are assigned to the team they belong to or own. They can also create and view requests from processes that are assigned to themselves but not to the team.</p>
<p><b>Same device cannot be assigned to Bot Creator and unattended Bot Runner for triggers</b></p> <p>After you update to this Enterprise A2019 version from an earlier version, a default device that is assigned to a Bot Creator or an attended Bot Runner cannot be assigned to an unattended Bot Runner for deploying triggers.</p> <p><b>Recommended action:</b> Use separate devices or device credentials (auto-login) for a Bot Creator and an attended Bot Runner as deployments can overlap or override across licenses.</p>
<p><b>Create a Request action URI</b></p> <p>The process selector in the <b>Create a Request</b> action is replaced with a public repository uniform resource identifier (URI). <i>AARI web package</i></p>

Fixed features		
Build number	Service Cloud case ID	Description
8134	--	The table element now renders properly even when the <b>Row before scrolling</b> parameter value does not match the number of rows. Previously, the table did not render properly and displayed empty cells.

Fixed features		
Build number	Service Cloud case ID	Description
8122	--	When you check out a process, and add, modify, or remove tasks in the process editor, the dependencies are now correctly updated when the process is checked in.
8098	00707684, 00707688, 00707192, 00706781, 00707900, 00709109	All event triggers are now retained when you update to this version from an earlier version.
8098	--	In the process editor, undo and redo functions are now available for both canvas and properties panel interactions by default. Previously, the undo and redo functions were only available for canvas interactions.
8098	--	Previously during bot runtime, if you deleted all the existing rows from a table before adding a new row, the columns and rows of the table were misaligned. You can now drag and resize any column to reset the table alignment.
8098	--	All the trigger events within a form are now retained and no longer fail when the form is closed and reopened during bot runtime.
8098	--	In the process editor, if you replace the <b>Go to</b> option with an <b>End process</b> , the <b>End process</b> icon now displays the correct status (Completed, Failed, Canceled). Previously, the status was not displayed correctly and had to be changed manually by using the <b>End process</b> option.
8098	--	When you delete a request from the <b>Request</b> tab and it is sent to the recycle bin, the related task from the <b>Task</b> tab is now removed.
8098	--	When you filter your tasks in the <b>Task</b> tab, the results shown in the tab now retain the information when you navigate between different tabs.

Deprecated features
<p><b>Support removed for device pool configuration</b></p> <p>An AARI administrator can no longer use the device pool configuration to deploy bots in a process. After upgrading to Enterprise A2019.19 from an earlier version, verify that the scheduler user configuration is set up in order to successfully execute your bots in the process.</p> <p><a href="#">Configure scheduler user for AARI on the web</a></p>

Known limitations
<p>When you create a request from a process (public or private) and enter all the required information in the initial form, the initial form cannot be submitted because the <b>Submit</b> option does not work. This issue occurs for all initial forms with at least one mandatory field.</p> <p><b>Workaround:</b> Make all fields optional.</p>
<p>When you submit an initial form or task in a request view that contains a check box with at least two options and at least one option is selected, the check box value is not changed and defaults to a false Boolean value.</p>
<p>If the <b>Set</b> action is used immediately after a <b>Get</b> action, the value assigned to a variable using the <b>Get</b> action is not retrieved in the specified form element of the <b>Set</b> action during bot runtime.</p>
<p>An AARI manager can create a request from a process that is assigned to them but not to their team. They can create and complete the request if the process contains only bot tasks. If the process contains a human task, the manager cannot assign the human task to themselves.</p> <p><b>Workaround:</b> Assign the process to both the manager and their team.</p>
<p>In the process editor, the <b>Go To</b> option shows only the <b>Human Task</b> and <b>Bot Task</b>, it does not show the <b>Filter Task</b> or the <b>Process Task</b>.</p>

## Discovery Bot

New features
<p><b>View the duration of each recorded step</b></p> <p>A recorded step is now displayed in minutes and seconds for the business user and analyst. Use this information to understand which steps are a bottleneck in the current process and will provide most benefit from automation. The step duration is displayed from the <b>Recordings</b> page (below the screenshot image), and from the <b>View process</b> and <b>View opportunities</b> page from the Preview pane window.</p> <p><i><a href="#">Record a Discovery Bot business process</a></i></p>

Changed features
<p><b>Enhancement to the screenshot</b></p> <p>The screenshot image of the recorded step is now increased to full size for a more clear, detailed view of the recorded step.</p>

Fixed features	
Service Cloud case ID	Description
--	You can now click the <b>Screen</b> icon to display an image that you have hidden and saved. Previously, you had to click <b>Screen</b> and then click <b>Save</b> to display the image again.

Fixed features	
Service Cloud case ID	Description
--	When an opportunity is created for a system-generated view with filters applied, the filter now persists across the view displayed in the <b>Aggregated</b> tab from the <b>Opportunities</b> page. The filter is not reapplied on the view from the <b>Opportunities</b> page and the <code>No recording data</code> message is no longer displayed.
--	When you now cancel a recording, the recording is not displayed on the process tile in <b>Process Cycle</b> .
--	You can now approve a recording with 2000 steps. The Recording status is displayed as approved.

Known limitations
Actions such as double-click, drag-drop, click and hold, and text select are not supported when you are recording a business process.

## IQ Bot

New features
<p><b>Support for variables in IQ Bot actions</b> (Service Cloud case ID: 00511178)</p> <p>IQ Bot On-Premises and Cloud</p> <p>You can now use variables in the <b>Download all documents</b> and <b>Upload Document</b> actions in the IQ Bot package.</p> <p><a href="#">Create a variable</a>   <a href="#">IQ Bot package</a></p>

Changed features
<p><b>Rename a learning instance</b> (Service Cloud case ID: 00675803)</p> <p>You can now rename a learning instance in staging in IQ Bot.</p>
<p><b>Sequential document processing</b> (Service Cloud case ID: 00662968, 00665331)</p> <p>When you click <b>See Extraction Results</b>, IQ Bot now opens that request in a new browser tab where its number in the queue is displayed. This number keeps decreasing as the previous requests in queue are processed.</p>
<p><b>Dutch language support</b></p> <p>IQ Bot now supports the Dutch language with ABBYY FineReader Engine.</p>

Changed features
<p><b>Configure OCR settings using REST APIs</b></p> <p>A user with AA IQ Bot Administrator role can now use the <code>appConfigurations</code> API to read and update the OCR settings.</p> <p><i>Select an OCR engine</i></p>

Fixed features	
Service Cloud case ID	Description
00639117	Numeric format in the Polish language is now accepted in the IQ Bot Validator.
--	When you upload a document immediately after deleting a bot it was associated with, extraction results are now displayed irrespective of when the bot was deleted. Previously, an interval of 3 minutes was required to view the extraction results of the deleted bot.
00636899, 00683451	When you create a learning instance using the custom domain, the field names now appear correctly, irrespective of the custom domain language.
00459301, 00677204, 00532325, 00658245	Custom Python logic now displays extraction results in the Designer without any errors.
00657928, 00679540	Exported IQ Bot archive (.iqba) files no longer contain any unclassified records in the .csv files.
00704365	If documents uploaded during production have fewer pages than the staging documents that the bot was trained with, these production documents are now processed without any errors.
00703560, 0062442	When you migrate learning instances using the append option, all records are now correctly migrated, irrespective of the number of records in the IQBA file.
00715124	IQ Bot now deletes temporary files downloaded from Amazon S3 server in the <code>C:\windows\temp\</code> folder when they are no longer required. As a result, storage is no longer consumed by these temporary files.
00686297	IQ Bot machine learning services are now correctly installed when you install IQ Bot.

Known limitations
<p>IQ Bot On-Premises and Cloud</p> <p>If you click <b>See Extraction results</b> multiple times, the <b>Learning instances listing</b> page is opened instead of the extraction results.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>When creating a table on the <b>Designer</b> page, if you click <b>See Extraction results</b> without completing the table creation, extraction results are not displayed.</p> <p><b>Workaround:</b> Create the table first and then click <b>See Extraction results</b>.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>An error message is displayed when you refresh the extraction results page for a learning instance when the associated bot is moved to production.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>When a bot is deleted, an incorrect error message is displayed when you click the <b>Test bot</b> option on the <b>Bots listing</b> page.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>If you rename a learning instance in production and download the files, all the files associated with the original learning instance are also downloaded. For example, if you rename a learning instance from Sales1 to Sales2, all the files associated with Sales1 are also downloaded when you download Sales2.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>If you have multiple learning instances and you click <b>See Extraction results</b> for all of them, the extraction results are not processed in the order of their request.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>When you create a learning instance with check box fields and run a Python script associated with the check box, an error message is displayed on the <b>Designer</b> page.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>When you upload staging or production documents to a learning instance, temporary files are created in the C:\Windows\Temp folder, and the folder size might increase over a period of time. Therefore, manually delete the files from this folder because it can cause IQ Bot to stop responding.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>If you select the <b>Only for me</b> option when installing the Bot agent, the <b>IQ Bot Extraction</b> action has the following issues:</p> <ul style="list-style-type: none"> <li>• Takes a very long time to process a document.</li> <li>• Some of the documents might not be processed successfully.</li> </ul> <p><b>Workaround:</b> During Bot agent installation, choose the <b>Anyone who uses this computer (all users)</b> option.</p>

Known limitations
<p>IQ Bot On-Premises</p> <p>(Service Cloud case: 00762174) Using the Database Migration Assistant to migrate from IQ Bot 11.x (five databases) to A2019 (unified database) in Microsoft Azure Database is not supported.</p>

Deprecated features
<p>IQ Bot On-Premises is no longer supported on Windows Server 2012.</p>

## Bot Insight

Fixed features	
Service Cloud case ID	Description
00669196	When you apply date filters on a dashboard and then apply an attribute filter in the widget, the system now filters by a specific date. Previously, the date filter applied at the dashboard level was ignored when the attribute filter was selected at the widget level. As a result, historical data was also displayed.

---

**Important:** The supported packages information is moved to this topic: [Viewing package versions available in the Control Room](#).

---

## Enterprise A2019.18 Release Notes

*Release date: 11 January 2021*

Review the new features, changed features, fixed features, known limitations, and supported packages in the Enterprise A2019.18 (Build 7560) release. For IQ Bot, Build 7553 is available for Cloud customers and Build 7554 is available for On-Premises customers. There are no security fixes in this release.

---

**Important:** We have updated Enterprise A2019.18 to Build 7560 to include fixes for issues with WLM (Service Cloud case IDs 00696614 and 00703339) and SSO authentication on Automation Anywhere Cloud (Service Cloud case IDs 00706042, 00706074, 00706201, 00706195, 00706134, 00706022, and 00707033). See the [Fixed features](#) section for more information.

---

- [Migration features](#)
- [Enterprise A2019](#)
- [AARI](#)
- [Discovery Bot](#)
- [IQ Bot](#)
- [Bot Insight](#)
- [Supported packages](#)

## Migration features

11.x and 10.x features
<p><b>Migrate MetaBots with screens</b></p> <p>Migrate MetaBots that contain screens as assets. You can migrate screens based on HTML, MSA, and .NET technologies and captured using the <b>Object</b>, <b>Image</b>, and <b>Coordinate</b> play modes.</p>
<p><b>Configure timeout in Bot Migration package</b></p> <p>When migrating bots, you can now set a timeout value in the range of 3 through 90 minutes (default value is 90 minutes). If the migration of any specific bot is not completed within the set time, a timeout message is displayed and the migration process moves to the next bot.</p>
<p><b>Use regular expressions in variables</b> (Service Cloud case ID: 00628227)</p> <p>Use regular expressions (regex) in value type variables to specify the entity on which you want to perform an operation. For example, actions in the File, Folder, String, and Window packages allow use of regular expression in variables.</p> <p>When 11.x or 10.x bots with commands that use regular expressions in variables are migrated, if their equivalent actions in Enterprise A2019 do not support regular expressions, the regular expression is converted to string in the migrated bots.</p>
<p><b>Migrate MetaBot that returns a list variable</b></p> <p>You can now migrate MetaBots that contain logic that return a list variable to the parent bot.</p>
<p><b>Migrate bots that use functional keys</b></p> <p>Migrate bots that use <b>functional keys</b> such as F1, F2, and F3 in the <b>Send Text</b> command.</p>
<p><b>Migrate bots that extract information from PDF</b></p> <p>Migrate bots that use the <b>Extract Form Fields</b> command to extract data from the fields in a PDF file.</p>

11.x only features
<p><b>Migrate bots to Enterprise A2019 Cloud</b></p> <p>You can now migrate to Enterprise A2019 Cloud by using the Cloud Migration Utility. Use the utility to upload your 11.x data to Automation Anywhere Cloud.</p> <p><a href="#">Migrate from 11.x to Cloud</a></p>
<p><b>Migrate to Enterprise A2019 on Linux CentOS</b> (Service Cloud case ID: 00654757)</p> <p>You can now migrate from 11.x to Enterprise A2019 installed on Linux CentOS.</p> <p><a href="#">Migrate to Linux CentOS</a></p>
<p><b>Migrate imported 11.x bots to Enterprise A2019</b></p> <p>You can now migrate 11.x bots that you imported using the BLM feature or the Import API to Enterprise A2019 by using the migration wizard.</p>

**11.x only features****Migrate bots that use the following attributes:**

- Bots that use **regular expression (regex)** to search for the string and title of an application window on which you want to perform an operation
- (Service Cloud case ID: 00616115) Bots for which **custom format** is configured for system dates  
The system uses the **AADefaultDateFormat** global value to store the format of the date.
- Bots that use the **Search Field** command to search a field index or field name by using text in the Terminal Emulator

## Enterprise A2019

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

**New features****Create a Citizen Developer user**

Administrators can now use the Citizen Developer license to create Citizen Developer roles and users in the Control Room. Users with this license can create and run bots (including bots with triggers) on their devices.

[Automation 360 licenses](#) | [Create a Citizen Developer role](#) | [Create a Citizen Developer user](#)

**Recorder enhancements**

- Use the AISense Recorder **Define** option to record an interaction, such as click active text, with an object that is only visible when you hover the mouse over the object.
- If you record a click and keystrokes in a text box with a **Control Type** of `PASSWORD_TEXT`, the **Recorder** does not capture the keystrokes entered into the field. Instead, the action selects the **Set text** option and offers users the option to select a credential from the Credential Vault, enter a credential variable, or enter an insecure string.

**Export and import Bot Insight dashboards using BLM**

The Bot Lifecycle Management (BLM) feature now enables you to export and import Bot Insight dashboards (default, custom, and published) associated with analytics bots from one Control Room instance to another. You can also export and import Bot Insight dashboards using the BLM export and import APIs.

[Export bots](#) | [Import bots](#)

New features
<p><b>Support for non-persistent VDI</b></p> <p>Non-persistent virtual desktop infrastructure (VDI) is now supported for temporary devices so that you can configure settings for temporary devices in the Control Room or during Bot agent installation.</p> <p>The feature includes the following capabilities:</p> <ul style="list-style-type: none"> <li>• Automatically register a device.</li> <li>• Automatically mark a device as default for the logged-in user.</li> <li>• Automatically add a device to an existing pool.</li> <li>• Delete offline devices from a list of devices.</li> <li>• Add parameters for temporary devices in the Bot agent MSI file.</li> </ul> <p><a href="#">Configure default device settings</a>   <a href="#">Configure auto-delete temporary device settings</a>   <a href="#">Perform silent installation of Bot agent on temporary devices</a></p>
<p><b>Efficiently map input and output variables between parent and child bots</b> (Service Cloud case ID: 00537090, 00698697)</p> <p>For input variables, use the <b>Quick map</b> option to select the variables and set the values for the parent bot to pass. For output variables, use the <b>Multiple variables</b> tab to associate each dictionary key with a variable. This feature eliminates the need to use actions to extract the output dictionary values.</p> <p><a href="#">Task Bot package</a>   <a href="#">Using the Run action</a></p>
<p><b>Support for PowerBuilder application in App Integration package</b> (Service Cloud case ID: 00680703)</p> <p>The App Integration package now supports PowerBuilder to capture and extract text from a window application. The <b>Capture text of window</b> action enables you to open a PowerBuilder screen to capture all the data and verify the captured text.</p>
<p><b>Enhancements to check-out option in the private workspace</b></p> <ul style="list-style-type: none"> <li>• The <b>My bots</b> page in the private workspace displays a new status <b>Checked out edited</b> for bots that are checked out and edited.</li> <li>• Use the <b>Revert edits</b> option to cancel any changes you made to the checked-out bot in the private workspace.</li> </ul>
<p><b>Programmatically delete bots, files, and folders</b></p> <p>Use the <code>Delete files/folders</code> API to delete objects from the private or public workspace.</p> <p><a href="#">Delete file/folder API</a></p>
<p><b>Manage scheduled bots using APIs</b></p> <p>Use the <code>Bot Scheduler</code> APIs to create, update, and view details, and delete bot schedules. Bots can be scheduled to run at a specific date and time on an unattended Bot Runner, or on a recurring basis.</p> <p><a href="#">Bot Scheduler APIs</a></p>

New features
<p><b>New action in Terminal Emulator package</b></p> <p>Use the <b>Search Field</b> action in the Terminal Emulator package to search for a field based on the text it contains. This action returns the name or index of the field based on the option selected.</p> <p><i>Terminal Emulator package</i></p>
<p><b>New action in PDF package</b></p> <p>Use the <b>Get Property</b> action in the PDF package to retrieve the properties of a PDF file and assigns the properties to a dictionary variable.</p> <p><i>Using the Get property action</i></p>
<p><b>New actions in Browser package</b></p> <p>Use the following actions in the Browser package:</p> <ul style="list-style-type: none"> <li>• <b>Close:</b> Closes a Google Chrome browser window or tab.</li> <li>• <b>Get source code:</b> Retrieves the source code of a web page and saves it to a string variable.</li> <li>• <b>Go back:</b> Returns to a web page that you previously visited in the current tab.</li> <li>• <b>Open:</b> Opens the browser to a specific web page in an existing tab, new tab, or window.</li> <li>• <b>Run JavaScript:</b> Executes JavaScript in a web page.</li> </ul> <p><i>Browser package</i></p>
<p><b>Specify application window dimensions</b></p> <p>Use the <b>Resize windows</b> option to set the window height and width to specific dimensions or to the dimensions at which it was captured. This feature enhances the bot's ability to identify the target object.</p> <p>The following packages support this feature:</p> <ul style="list-style-type: none"> <li>• App Integration</li> <li>• If <b>Image recognition</b> condition</li> <li>• If <b>Legacy Automation &gt; Window Control</b> condition</li> <li>• Image Recognition</li> <li>• Simulate keystrokes</li> <li>• Legacy Automation <b>Desktop &gt; Manage windows controls</b> action</li> <li>• Loop <b>While &gt; Image recognition</b> condition</li> <li>• Loop <b>While &gt; Legacy Automation &gt; Window Control</b> condition</li> <li>• Mouse</li> <li>• OCR</li> <li>• Screen</li> </ul>
<p><b>Support for function keys in Terminal Emulator package</b></p> <p>Function keys (F1 through F24) are now supported to automate processes using ANSI and VT100 terminals in the Terminal Emulator package.</p>

New features
<p><b>Use regex case insensitive flag for Window title</b></p> <p>Enable the regex <b>Case insensitive</b> flag to identify a <b>Window title</b> field as not case-sensitive. This feature enables you to successfully run the bots even if the letter case does not match the captured window title.</p> <p>The following packages and actions support this feature:</p> <ul style="list-style-type: none"> <li>• Wait</li> <li>• Image Recognition</li> <li>• Simulate keystrokes</li> <li>• Mouse &gt; <b>Click</b> action</li> <li>• Legacy Automation <b>Desktop &gt; Manage windows controls</b></li> <li>• OCR &gt; <b>Capture window, Capture area</b></li> <li>• Screen &gt; <b>Capture window, Capture area</b></li> <li>• Recorder &gt; <b>Capture</b></li> <li>• Window: <b>Activate, Close, Maximize, Minimize, Resize</b></li> </ul>
<p><b>Unattended Bot Runner supported on Citrix devices</b></p> <p>You can now deploy bots on unattended Bot Runners on virtual machines on Citrix XenDesktop and Citrix VDI Windows 2016.</p>

Changed features
<p><b>Only Bot Scanner related files and folders are deleted</b></p> <p>The Bot Scanner now deletes only Bot Scanner related files and folders from the destination folder.</p> <p><i><a href="#">Scan bots using Bot Scanner</a></i></p>
<p><b>Enhanced transport layer security</b> (Service Cloud case ID: 00677546, 00681830)</p> <p>The default Elasticsearch ports (47599, 47600) now use the more secure TLS version 1.2 and later as the communication channel between the Control Room and Elasticsearch server.</p>
<p><b>Enhanced Update node action in XML package</b> (Service Cloud case ID: 00663089)</p> <p>When you edit and save an XML node, the bot updates the required attributes and their values in an alphabetical order, without removing any existing attributes of the node.</p> <p>For example, consider two existing attributes in an XML node such as <code>Name=Peter</code> and <code>Phone=9829xxxxxxx</code>. If you change the value of the phone attribute as <code>9887xxxxxxx</code> and add a new attribute <code>Gender</code> with value as <code>Male</code>, the bot updates the phone value and adds the gender as a new attribute, without removing the existing name attribute.</p>
<p><b>Interface change in Excel basic and Excel advanced packages</b></p> <p>The <b>session name</b> field is now the last field in actions in the Excel basic and Excel advanced packages.</p>
<p><b>Access at subfolder level in Control Room repository</b> (Service Cloud case ID: 00634847, 00681221, 00685654)</p> <p>An administrator can now allow access at the subfolder level in the Control Room by assigning the <b>Run, Check-in</b> and <b>Check-out</b> permissions to the subfolder. You can only access the contents of the subfolder and not the other bots or files in the parent folder.</p>

Changed features
<p><b>Increased working area in the Bot editor</b></p> <p>More horizontal and vertical screen area is available in the Bot editor for developing bots. You can hide or display the <b>Actions</b> and <b>Details</b> panels to maximize the working area in the Bot editor.</p>

The following table lists the fixed features and the builds in which they were fixed (Build 7560 is the latest build, and Build 7554 is the previous build). The fixes are cumulatively available in the latest build.

Fixed features		
Build number	Service Cloud case ID	Description
7560	00696614	Bot deployment is no longer delayed after you insert Work Items if idle devices are available for the deployment in queues.
7560	00703339	The post Work Item insertion flow is now improved so that bot deployments are not delayed.
7560	00706042, 00706074, 00706201, 00706195, 00706134, 00706022, 00707033	An issue with Control Room login page not supporting SAML for SSO and reporting an errant IPD response has been addressed. The SSO function of the Control Room login works as expected.
7554	00659336	11.x bots that use the Image Recognition command or <b>Image Recognition</b> condition of the If command now run successfully after migration.
7554	00647634	The Bot Scanner no longer becomes unresponsive when scanning a large repository.
7554	00678614	An error is no longer encountered when you migrate a bot with a credential name that contains a space character or a special character.
7554	00669247	An error is no longer encountered when you download a file from a URL that contains a Unicode character using the <b>Download files</b> action of the Browser package.
7554	00685916	If you have used the <b>Date</b> system variable as an input variable in a MetaBot, the <b>Date</b> system variable is now available after migration.
7554	00674594	The Bot Scanner no longer encounters an error when scanning a bot that uses the <b>Excel Column</b> system variable after the Loop command and the column name specified in that variable contains a space character.
7554	00691905	An error is no longer encountered when you edit a user after migrating to Enterprise A2019 from Version 11.3.3.

Fixed features		
Build number	Service Cloud case ID	Description
7554	00691072	An error is no longer encountered because of the bypass configuration of proxy settings when you use the Bot Migration Wizard.
7554	00689910	You can now import more than 2100 bot files without any SQL exception error.
7554	00669927	When you execute the Bot Insight <b>Business Data</b> and <b>Operations Data</b> APIs, only information limited to the logged-in tenant is now retrieved in the API response.
7554	00639779	After you log in to the Control Room and connect manually to a VPN, the Bot agent now reconnects automatically. You do not have to restart the Bot agent service to reconnect.
7554	00622075	When you run a bot on a user device that has an extended display, the runtime window is now completely visible on the main display. Previously, the window was partially visible between the main and extended display.
7554	00678454	In Excel advanced, you can now use the <b>Set cell</b> action to write more than 4100 characters in the excel file. Previously, the bot execution failed when the cell value had more than 4100 characters.
7554	00675333	In the Number package, the field in the <b>Assign</b> action is now corrected as <b>Select the source number variable/ value</b> . Previously, the <b>Select the source string variable/ value</b> field was incorrect.
7554	00674315, 00677925, 00684201	When you create a TaskBot using the <b>If</b> and <b>Else if</b> actions and change the placement of the <b>Else if</b> block action, there is improved visibility in the <b>Flow</b> view. Previously, the TaskBot was not displayed properly on a low contrast display when the <b>Else if</b> block placement was changed.
7554	00662072, 00674336	In the Terminal Emulator package, you can now correctly page up using the KEY_PGUP function key and page down using KEY_PGDOWN for the <b>TN5250</b> terminal type.
7554	00658261	The PDF <b>Extract image</b> action now supports CMYK (cyan, magenta, yellow, black) images format when you extract and save a CMYK image to an RGB (red, green, and blue) image. Previously, if PDF files contained CMYK images, the bot could not extract them and displayed an error.

Fixed features		
Build number	Service Cloud case ID	Description
7554	00675749	When you receive emails using the EWS server option, the <code>emailCc</code> and <code>emailTo</code> variables now return the proper value. Previously, these variables returned blank values.
7554	00663610	In the Ftp/Sftp package, you can now connect to <code>ftp.box.com</code> and use the <b>Get folder</b> action. Previously, the <b>Get folder</b> action downloaded files in the folder, causing the bot to run in an infinite loop.
7554	00675710	In the Data Table package, the <b>Remove duplicate rows</b> action now removes all duplicate rows rather than a single duplicate row.
7554	00539762	In the <b>For value</b> action of the Prompt package, characters are no longer visible during keystrokes of masked values.
7554	00679370, 00673085, 00674546, 00676912, 00678852, 00678796, 00692420, 00695390	An unknown error is no longer encountered when you run the <b>Open</b> Excel file action from a network drive.
7554	00672719, 00673048	Audit log entries in the Control Room are now retained even if the Elasticsearch data is configured to a file path other than <code>C:\</code> (C drive) during installation.
7554	--	You can now insert Work Items from one queue to another queue for workload automation.
7554	--	You no longer have to pause and resume queues because Work Items are now processed and not randomly skipped when you use the priority queuing or round-robin method for workload automation.
7554	--	The Recorder package no longer takes time to upload to a remote application repository path of an On-Premises Control Room deployed on Microsoft Azure.
7554	00683744	You can now capture objects from the Google Chrome browser using the Recorder capture action. The plug-in not installed or disabled error is no longer displayed.
7554	00672446, 00671782, 00671065, 00683870	When you upgrade to this release from an earlier release (for example, Enterprise A2019.16), the Elasticsearch OpenDistro error message is no longer displayed. Also, the previous <code>application_log</code> indices from Elasticsearch are deleted to free up disk space for the upgrade.

Fixed features		
Build number	Service Cloud case ID	Description
7554	00690003	You can now use the Terminal Emulator package without any change in the screen resolution for the mainframe terminal type TN3270. Previously, the screen resolution was not supported for terminal type TN3270.
7554	00679244	In Dictionary and List packages, you can now use the <b>Datetime</b> data type in the source dictionary variable field of the <b>Assign</b> action. Previously, an error was encountered during bot execution if you used <b>Datetime</b> data type in the source dictionary variable field.
7554	00673591	Fixed an issue in the Task Bot package where the system selected all the input variable options when the user clicked away from and returned to the action.
7554	00684905, 00703481	A TaskBot now runs as scheduled and no longer shows the device status as <b>Picked at runtime</b> on the <b>View task in progress</b> (Activity) page when the TaskBot is running.
7554	00573081	The audit log page in the Control Room now records all entries related to bot deployment. Also, when a parent task with many child bots is deployed, the audit log now shows correct entries. Previously, some audit log entries were missing for bot deployment and if a parent task with many child bots was deployed, the entries displayed were incorrect.

Known limitations
Enterprise A2019 does not yet support the counter behavior of the \$Excel Cell Row\$ system variable in 11.x when the variable is used in the Loop command and the <b>Each row in Excel Dataset</b> option is selected. This behavior is available in 11.3.0 and earlier versions by default, and in the Version 11.3.1.2 and later versions when the <code>retainexcelcellrowlegacybehavior</code> tag in the <code>AASettings.xml</code> file is set to true.
A bot fails when it runs an action that reloads the web page, such as the <b>Recorder &gt; Capture</b> action when it is used to click a link or the <b>Browser &gt; Open</b> action, followed by a <b>Browser &gt; Run JavaScript</b> or <b>Browser &gt; Extract source</b> action. You must add a delay of at least 5 seconds to give the browser time to load.
A bot fails when it runs the <b>Browser &gt; Close</b> action to close the last Google Chrome window and the window contains only one tab. Use the <b>Tab</b> or <b>All browsers</b> options instead.
A bot can return only a maximum of 3 MB to an output variable. <b>Workaround:</b> Store the bot output on the device, such as in a .txt file. If the output must be shared across multiple Bot Runners, store the output in a shared drive.

<b>Known limitations</b>
<p>The AISense Recorder fails if you manually upgrade the Recorder package version, such as by importing a bot that contains a Recorder package version from a more recent build than the destination Control Room. Always upgrade the Recorder package through the Control Room.</p>
<p>If you install the Google Chrome extension in the Microsoft Edge browser, it causes recording and runtime errors in bots that interact with the Google Chrome browser. Even if you did not manually install the Google Chrome extension, the auto-sync settings in the Microsoft Edge browser might have automatically installed the extension.</p> <p>If the Google Chrome extension is installed in the Microsoft Edge browser, you must remove the Google Chrome extension from the <code>edge://extensions</code> page.</p>
<p>When the regex <b>Case insensitive</b> flag is enabled for actions that include the window title, a recapture of the application window fails.</p>
<p>The input parameters for DLLs are not automatically passed from the parent bot to the child bot in Enterprise A2019 for migrated MetaBots.</p>
<p><b>Workload automation limitation for manual Credential Vault mode</b> (Service Cloud case ID: 00711410)</p> <p>You might face issues when migrating your workload automation if the Control Room is configured to use a manual mode for Credential Vault.</p> <p><b>Workaround:</b> As the Control Room administrator, perform the following steps:</p> <ol style="list-style-type: none"> <li>1. Change the Credential Vault mode to express from manual in the Control Room database configuration table.</li> <li>2. Add the credential vault key to the <code>CredentialVault.dat</code> file in the Control Room server repository.</li> <li>3. Restart the Automation Anywhere Control Room Service.</li> <li>4. Re-register the Bot agent or restart the Bot agent service.</li> </ol>
<p><b>Cloud migration limitations</b></p> <ul style="list-style-type: none"> <li>• The Cloud migration utility keeps running in background if you close the utility when the 11.x data is being uploaded.</li> <li>• If you have configured 11.x Control Room in cluster mode, you must stop the Automation Anywhere Control Room Service on all the nodes available in the cluster.</li> <li>• If the Cloud migration utility is installed on a different device than the device on which the 11.x Control Room you want to migrate is installed, an Elasticsearch unavailable error occurs.</li> <li>• If you have SSO configured on the 11.x Control Room, an error is encountered after migration to Cloud if you change the authentication from database to SSO.</li> <li>• If you provide the validation code within double quotation marks, the utility successfully validates the code but fails when uploading the 11.x data.</li> </ul>
<p>If you open a table variable for editing and then open another table variable and click <b>Cancel</b> in the <b>Edit table</b> window, the schema of that table reverts to the same schema of the first table. This occurs only in the interface; it does not impact the bot.</p> <p><b>Workaround:</b> Refresh the window containing the Control Room.</p>

## Automation Anywhere Robotic Interface (AARI)

<p><b>New features</b></p>
<p><b>New AARI web package</b></p> <p>Use the AARI web package to perform actions such as assign, query, and cancel tasks; create and query requests; and retrieve a list of team members.</p> <p><a href="#">AARI web package</a></p>
<p><b>Filter by time</b></p> <p>You can now filter your requests and tasks by time:</p> <ul style="list-style-type: none"> <li>• <b>Requests</b> tab: Use the <b>Created</b> and <b>Updated</b> options in the <b>Filter</b> window to select any dates.</li> <li>• <b>Tasks</b> tab: Use the <b>Task created</b> and <b>Task updated</b> options in the <b>Filter</b> window to select any dates.</li> </ul> <p><a href="#">Filter and search for a request</a>   <a href="#">Filter and search for a task</a></p>
<p><b>View updated dates</b></p> <ul style="list-style-type: none"> <li>• Use the new <b>Updated</b> column in the <b>Requests</b> tab to view the dates and time of a request that was last updated.</li> <li>• Use the new <b>Task Updated</b> column in the <b>Tasks</b> tab to view the date and time of a task that was last updated.</li> </ul>
<p><b>Variable options</b></p> <p>In the <b>Insert a variable</b> window, the <b>Variable</b> field now shows child elements of available references, which include <b>Dictionary</b>, <b>List</b>, <b>Record</b>, and <b>Table</b> variable types.</p>
<p><b>Delete a request</b></p> <p>AARI administrators, managers, and users can now delete requests created by the AARI process. The AARI administrator can delete any requests. AARI managers can delete requests of the team for which they are the owner. AARI users can delete only the requests they have created.</p> <p><a href="#">Delete a request</a></p>
<p><b>Automatically assign managers and users</b></p> <p>Users can now select the <b>Auto assign this task</b> option in the <b>Human Task</b> to assign managers or users to the task. Users can also select the <b>Auto assign the target task to</b> option in the <b>Go to</b> element to assign managers to the task.</p> <p><a href="#">Create an AARI process</a></p>

## New features

### Enhancements to elements in the form builder

- **Time** element: Includes the time element in a form.  
*Using the Time element*
- **Date** element: Set the date format of the user machine as the default format for the date element in the form.  
*Using the Date element*
- **Select file** element: Drag the selected file into the form during bot runtime.  
*Using the Select File element*
- **Password** element: View the password you enter in this field during bot runtime.  
*Using the Password element*

### Updates to interactive forms

- Use the **Change Form Title** to edit or change the title of the selected form during bot runtime.
- Use the **Validate form** option now for the **Table** element.

*Interactive forms package*

## Changed features

### Process package renamed to AARI web package

The **Process** package is now renamed to the AARI web package, which includes the **Create a Request** action and additional new actions.

*AARI web package*

### Enhancement to process management page

In the process management page, the AARI admin can now edit the **Process Title** and **Process Description** metadata. You can now add a title and provide a short description for the process.

### Enhancement to the activity page

All the Bot Runner (attended or unattended) trigger deployments in queue are now displayed in the **Activity > In progress** page.

*Activity*

### Edit check box, radio button, and drop-down form elements in process editor

In the process editor, you can now edit and update the **List of options** and **Default value** fields for the following form elements: **Checkbox**, **Radio button**, and **Dropdown**.

Fixed features	
Service Cloud case ID	Description
00678572	You can now view the <b>strict-transport-security</b> header when using the AARI web interface. This attribute informs the web browser to automatically convert websites requesting HTTP to load HTTPS instead in order to comply with the HTTP Strict-Transport-Security (HSTS) policy.
--	The <b>Display message</b> field in the <b>If/Else</b> pair action now displays the status message in request view. Previously, the status message was not displayed in the request view.
--	When you access AARI through the web interface, the <b>Request ID</b> and <b>Task ID</b> now correctly identify the data as numeric data type and sort it accordingly. Previously, the data was considered as string type and the sorting was not appropriate.
00646148	A bot is no longer deployed multiple times when the files and folders triggers are used.

Known limitations
When a user with a Citizen Developer license deletes an event trigger, this activity is not captured in the <b>Audit log</b> tab.
When you delete a request from the <b>Request</b> tab, the tasks associated with the request are not deleted and they are displayed in the <b>Tasks</b> tab.
If you click the refresh option in the <b>Tasks</b> tab and navigate away and back to the tab, the task filter applied does not remain the same. The filter always switches to <b>Pending</b> status.

## Discovery Bot

New features
<p><b>Use Model option for system-generated views</b></p> <p>You can now use the <b>Model</b> option to compare and find the best aggregated view for your recordings. Use this option to save as many views with different combinations as required.</p> <p>You can also save the view as a manual view to further customize your view and compare side-by-side. Select either an <b>Easy</b> or <b>Strict</b> model so that you can view recordings where the steps are the same versus recordings with different results with more branches in the process path.</p> <p><a href="#">Create a process view with branches and opportunities</a></p>

New features
<p><b>Use Filter option for system-generated views</b></p> <p>You can now use the <b>Filter</b> option to use a set of values to compare different sections of a process across various recordings by selecting a specific path and step filter. Used along with the <b>Model</b> option, the path and step filter options for a system-generated or manual view can help you to determine and decide on a good candidate for automation.</p> <p><i>Create a process view with branches and opportunities</i></p>
<p><b>Use toggle frequency counter option for system-generated views</b></p> <p>You can now use the toggle frequency counter to display the number of recordings that a particular path takes in the flow in a system-generated view. Use this option to help you understand the frequency of the path compared to other recordings or views.</p> <p><i>Create a process view with branches and opportunities</i></p>
<p><b>Remove recording screenshot for data privacy</b></p> <p>Use the <b>Screen</b> option (icon) to display or hide the recording screenshot before submitting the recording for the analyst to review. Use this option when you do not want to share personal image details with the analyst.</p> <p><i>Record a Discovery Bot business process</i></p>
<p><b>Download PDD from the Opportunities table</b></p> <p>You can now download a process definition document (PDD) for an opportunity directly from the Opportunities table listed on the <b>Opportunities</b> page. The PDD is automatically generated when the opportunity is created. After the PDD is generated, the field changes from generating PDD to <b>Download PDD</b>. You can then download and save the document.</p> <p><i>Review opportunities and convert to bot</i></p>

Changed features
<p><b>Screenshot image is increased</b></p> <p>The screenshot image is now increased to allow for better readability of captured steps. You can now use the scroll wheel to get a zoomed-in view of the step.</p>
<p>The <b>Export to Word</b> option now supports 2000 steps.</p>
<p>The <b>Convert to Bot</b> option now supports 2000 steps.</p>

Fixed features	
Service Cloud case ID	Description
--	The <b>Delete</b> icon is now properly visible in the edit recordings screen in Internet Explorer.
--	You can now change the zoom level in any canvas using the two-finger swipe on the trackpad of the <b>Aggregated</b> and <b>Comparison</b> tabs.

Fixed features	
Service Cloud case ID	Description
--	The red highlight is now visible on the captured screenshots from the <b>Recordings</b> page and from the preview pane from the <b>Aggregated</b> and <b>Opportunity</b> tabs for analyst review.

Known limitations	
When upgrading to this release, you must regenerate all PDDs created in Enterprise A2019.17. Click <b>Retry PDD Generation</b> to regenerate the PDDs.	
If you want to display an image that you have hidden and saved, you must first click the <b>Screen</b> icon and then click <b>Save</b> to display the image again.	
In the <b>Opportunities</b> table, the search field and filter drop-down option are not available for the <b>Process</b> and <b>Owner</b> columns.	
When an opportunity is created for a system-generated view with filters applied, the filter is reapplied on the view displayed within the <b>Aggregated</b> tab from the Opportunities page. The filter incorrectly displays <i>No recording data</i> . The <b>Convert to Bot</b> and the <b>Download PDD</b> options are not affected.	
When a recording is canceled, the recording is incorrectly incremented and displayed on the process tile in <b>Process Cycle</b> .	
You cannot approve a recording with more than 500 steps.	

## IQ Bot

New features	
<b>New IQ Bot Extraction package</b> On-Premises and Cloud IQ Bot now includes the IQ Bot Extraction package for processing invoices. The package uses Bot Runners on your local device instead of an IQ Bot server for processing. <a href="#">IQ Bot Extraction package</a>	

Changed features	
<b>Enhancement to Migration Utility</b> When you now export an IQ Bot archive (.iqba) file, only a single document associated with every available bot (group) training is exported.	
<b>Enhancement to IQ Bot Classifier package</b> The IQ Bot Classifier package now supports all languages supported by ABBYY FineReader Engine. Previously, only English language was supported. <a href="#">ABBYY FineReader Engine OCR supported languages</a>	

Fixed features	
Service Cloud case ID	Description
00668625	When you upload documents containing digital signatures to learning instances, the Designer now displays the correct success or error message.
00619139, 00695157	When you now run a bot and try to edit it while it is still running, the following correct message is displayed: Staging Documents for this Vision bot is in progress. Please try after some time. Previously, the following incorrect message was displayed: Learning instance not found.
00408482	You can now successfully export a custom domain created using Korean or other Asian languages.
00669197, 00681599	Node.js is now upgraded to version v10.22.1 to fix a security vulnerability.
--	Fixed an issue that caused the following error: failed to upgrade DB -1. You can now install IQ Bot in express mode without any errors.
00633197	During validation, if there is an error in the validation pattern, the validation process now fails, the correct message is displayed, and error logs are generated.
00689326	You can now view the extraction results correctly even when the bot is trained with check box fields.
00666456	IQ Bot machine learning services are now correctly installed when you install IQ Bot.

Known limitations
<p>IQ Bot On-Premises and Cloud</p> <p>The following limitations apply to the IQ Bot Extractionpackage:</p> <ul style="list-style-type: none"> <li>• If you process documents that do not belong to any created groups, they are not displayed in the <b>Details</b> page of the learning instance.</li> <li>• The <b>Checkbox</b> extraction option is not supported.</li> <li>• Some of the input invoices are not processed when you set up WLM with shared input and output folders.</li> </ul>
<p>IQ Bot On-Premises and Cloud</p> <p>When creating learning instances, IQ Bot sometimes does not restrict users from creating duplicate fields.</p>

Known limitations
<p>IQ Bot On-Premises and Cloud</p> <p>Occasionally IQ Bot fails to execute Python logic for tables other than the default one.</p> <p><b>Workaround:</b> Retry after you perform one of the following actions:</p> <ul style="list-style-type: none"> <li>• Click <b>Save and close</b>.</li> <li>• Click <b>See Extraction results</b>.</li> </ul>
<p>IQ Bot On-Premises and Cloud</p> <p>In PDF documents containing multiple pages, at times the segments do not display correctly on all pages.</p> <p><b>Workaround:</b> Use PDFBox OCR to process the documents.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>For the <b>Get page content</b> action of the IQ Bot Pre-processor package, if you select the <b>Create variable</b> option from the <b>List of strings extracted from page</b> menu, you can only use <b>Any</b> from the <b>Subtype</b> drop-down menu.</p>
<p>IQ Bot Community Edition, On-Premises and Cloud</p> <p>If you use Internet Explorer version 11.0.973.17763 to log in to IQ Bot and open <b>See extraction results</b> for a learning instance, you cannot open or download the <code>Preview.csv</code> file.</p>
<p>IQ Bot On-Premises</p> <p>You must be a service account user to install IQ Bot on a fresh machine.</p>

## Bot Insight

New features
<p><b>Access Bot Insight data from Tableau</b></p> <p>Use the Tableau connector in Bot Insight to access business and operational information. The Tableau connector connects to the Bot Insight APIs to create various business and operational metrics that you can analyze and visualize within Tableau.</p> <p><a href="#">Configure Tableau web data connector in Bot Insight</a></p>
<p><b>Assign Bot Insight license</b> (Service Cloud case ID: 00651973)</p> <p>Assign the Bot Insight license to users to enable them to view and perform tasks on the <b>Business</b> dashboard. You can now assign the license on a per-user basis, irrespective of the assigned roles.</p> <p><a href="#">Automation 360 licenses</a></p>

Fixed features	
Service Cloud case ID	Description
00689802	You no longer encounter an issue when you create and view default dashboards in a development (dev) environment. Previously, an error was displayed when you open the bot and clicked <b>Analyze</b> to create the default dashboard.

## Supported packages

Package	Version
Application	2.1.0-20201112-22332
App Integration	2.3.0-20201210-171315
Active Directory	2.1.0-20201112-223323
Boolean	2.1.0-20201126-165109
Browser	2.3.0-20201211-222811
Clipboard	2.1.0-20201126-165124
Comment	2.3.0-20201126-165125
CSV/TXT	2.3.0-20201126-165126
Database	2.2.0-20201112-223343
Data Table	2.5.0-20201201-130615
Datetime	2.2.0-20201126-165136
Delay	2.2.0-20201126-165137
Dictionary	3.2.0-20201126-165138
Run DLL	3.3.0-20201126-165850
Email	3.2.0-20201120-062604
Error handler	2.3.0-20201126-165148
Excel basic	2.4.0-20201126-165604
Excel advanced	5.3.0-20201208-090251
File	3.2.0-20201126-165151
Folder	3.1.0-20201126-165154
FTP / SFTP	2.2.0-20201115-072759
Image Recognition	2.2.0-20201117-081754
JavaScript	2.4.0-20201126-165412
Simulate keystrokes	2.5.0-20201112-223902
Legacy Automation	3.2.0-20201124-064544 1.5.0-20201125-004358

Package	Version
List	2.2.0-20201126-165427
Log To File	2.2.0-20201126-165428
Loop	2.1.0-20201126-165429
Message Box	2.1.0-20201126-165430
Mouse	2.2.0-20201112-223917
Number	2.1.0-20201126-165444
OCR	2.3.0-20201126-081210
Office 365 Excel	2.2.0-20201104-062559
Office 365 Calendar	2.1.0-20201111-162101
Office 365 OneDrive	2.2.0-20201126-165550
PDF	2.6.0-20201126-165555
PGP	2.2.0-20201126-165557
Ping	2.1.0-20201126-165559
Play Sound	2.1.0-20201127-115706
Prompt	2.2.0-20201109-192507
Python Script	2.4.0-20201208-064944
Recorder	2.10-20201215-211402
REST Web Service	3.2.0-20201112-224735
SAP	2.2.0-20201126-165852
Screen	2.2.0-20201126-165855
SNMP	2.1.0-20201126-165859
SOAP Web Service	3.2.0-20201123-093411
String	3.1.0-20201126-165909
System	3.0.0-20200921-090225
Terminal Emulator	3.6.0-20201213-084139
VBScript	2.4.0-20201208-065526
Wait	3.1.0-20201126-165922
Window	2.3.0-20201123-093430
Workload	2.1.0-20200825-071644
XML	2.1.0-20201126-165927

**Related reference**

[Community Edition A2019.18 Release Notes](#)

# Enterprise A2019.17 Release Notes

*Release date: 2 December 2020*

Review the new features, changed features, fixed features, security fixes, known limitations, and supported packages in the Enterprise A2019.17 (Build 7103) release. IQ Bot is on Build 7082.

- [Enterprise A2019](#)
- [AARI](#)
- [Discovery Bot](#)
- [IQ Bot](#)
- [Bot Insight](#)
- [Supported packages](#)

## Migration features

---

### **Important: Migration to Enterprise A2019 (currently available only to customers in the Migration Early Adopter Program)**

Migration to Enterprise A2019 is currently only available to select customers through our Migration Early Adopter Program. If you are interested in learning more about this program or a timeline for when migration will be available to all customers, contact your Automation Anywhere representative.

---

The following features apply to both **11.x** and **10.x**:

#### **Obtain information about upcoming support for commands and variables**

Bot Scanner provides information about the upcoming Enterprise A2019 release in which a specific command or variable will be supported or available.

#### **Migrate MetaBots with screens**

Migrate MetaBots that contain screens as assets. You can migrate screens based on the Java technology and captured using the **Object**, **Image**, and **Coordinate** play modes.

*[How MetaBots are migrated](#)*

#### **View progress of bot migration**

A progress bar is displayed in the migration results tab when the system starts migrating the bots.

#### **Migrate bots that use SAP command**

You can migrate 11.x bots that use the **GUI Automation** command to capture various objects from an SAP application.

*[Package mapping for migration](#)*

#### **Migrate bots that use the following attributes:**

- Regular expression to search for files on which you want to perform an operation.
- Variable to specify the child bot you want to run.
- System variables to retrieve information about a device's settings and its performance.
- The **Save header To** option and containing array and dictionary variables in the REST Web Service command to store the response header.

- Bots that contain failure responses from the REST Web Service command by using the **Capture failure response** option in Enterprise A2019. For 11.x bots, this option is enabled by default.

*[REST Web Service package](#)*

- Variables with names containing Arabic or Russian characters, or Japanese double-byte numbers.

*[Unicode range supported in variables](#)*

The following features apply to **11.x** only:

#### **Increment loop counter value by 1**

The `$Counter$` variable used in loop in 11.x bots is replaced with the `$Condition-Counter$` variable in the migrated bots and value for the variable set to 1.

Service Cloud case ID: 00659314

#### **View audit log migration reports**

View the status of audit log migration and other related information in the **All migrations** page. View additional information by using the **View migration** option for each audit migration instance.

*[Migrate 11.x audit logs](#) | [View migration reports](#)*

#### **Migrate 11.x Bot Insight data and dashboards**

- Migrate 11.x Bot Insight data and published dashboards of bots enabled for analytics by using the Bot Insight pre-migration utility and Bot Migration Wizard.

*[Export 11.x Bot Insight dashboards for migration](#) | [Migrate Enterprise bots](#)*

- View Bot Insight migration reports from the new **Bot Insight results** tab on the **Administration > Migration > View migration** page.

*[View migration reports](#)*

#### **Migrate bots that use the following attributes:**

- MetaBots with DLLs that use credential variables of string, character, or byte data type.
- The **Launch website** action of the Browser package to open a website in the Microsoft Edge browser.
- Shared session to establish a connection with a terminal server or open a Microsoft Excel spreadsheet and close the shared session from the child bot.
- IBM 5555 B01 and C01 models for TN5250 terminal types and the **Default** terminal for the VT100 terminal type.

## Enterprise A2019

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Connect to EWS server with OAuth authentication</b></p> <p>A new authentication is available for the Exchange Web Services (EWS) protocol with OAuth. You can use the OAuth authentication and enable your EWS-managed API applications to access Exchange online in Office 365.</p> <p><a href="#">Using the Connect action</a></p>
<p><b>Google Cloud Platform supported for On-Premises deployment</b></p> <p>You can now host the Control Room, and create and deploy automation on devices configured to use the Google Cloud Platform environment.</p> <p><a href="#">Operating system, environment, and platform supported for Control Room</a></p>
<p><b>LDAP channel binding for enhanced network security in On-Premises deployment</b></p> <p>Control Room supports LDAP channel binding in order to comply with a security release from Microsoft. LDAP channel binding provides enhanced security for network communications between an Active Directory and its clients. It provides a more secure LDAP authentication over SSL and TLS.</p> <p><a href="#">Configure LDAP channel binding</a></p>
<p><b>Use Bot agent with AWS WorkSpaces</b> (Service Cloud case ID: 00652474, 00676112)</p> <p>You can now deploy bots on Bot agent devices that are configured on AWS WorkSpaces.</p> <p><a href="#">Bot agent compatibility</a></p>
<p><b>VT220 terminal type supported in Terminal Emulator</b></p> <p>To establish a connection and communicate with another machine, you can now use the VT220 terminal for sending and receiving text.</p> <p><a href="#">Using the Connect action</a></p>
<p><b>Permission to cancel checkout in Control Room</b></p> <p>Use the <b>Cancel checkout</b> permission to cancel checked-out TaskBots or files from the public or private workspace.</p> <ul style="list-style-type: none"> <li>In the public workspace, the status of the bot changes to public.</li> <li>In the private workspace, the status of the bot changes to new if any changes were made to the bot. If there are no changes, the bot is replaced with a clone.</li> </ul> <p><a href="#">Check out a bot</a></p>

New features
<p><b>Enhancements to the Recorder</b></p> <ul style="list-style-type: none"> <li>Record a task using the Universal Recorder or AISense Recorder from a single point of entry. Both recorders are now managed through a single package, which enables faster and more efficient updates.</li> <li>You can now record tasks in a Microsoft Edge browser that runs on Chromium (versions 79 and later).</li> <li>Use the AISense Recorder <b>Define</b> option to capture an object that is only visible when you hover the mouse over the object.</li> <li>Use the <b>Resize window</b> option in the <b>Recorder &gt; Capture</b> action to set the window width and height.</li> </ul> <p>This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, thus increasing the likelihood that the bot identifies the target object.</p> <p><a href="#">Get started with recorders</a>   <a href="#">Universal Recorder supported applications and browsers</a>   <a href="#">Using the Capture action</a></p>
<p><b>Use shared session in Terminal Emulator</b></p> <p>Use the new <b>Shared session</b> option to pass the exact state of an application to a concurrently occurring TaskBot or MetaBot logic. For example, instead of connecting to the same application multiple times for different tasks, you can use the option to connect to the application using a single task, thus optimizing your automation logic in the long run.</p> <p><a href="#">Share session between TaskBot logic</a></p>
<p><b>Share an Excel session between bots</b></p> <p>Use the <b>Set session</b> action from the Excel basic or Excel advanced package to assign an Excel session to a variable, and then pass that variable from a parent to a child bot. This enables the child bot to access the worksheet opened in the parent bot.</p> <p><a href="#">Excel basic package</a>   <a href="#">Excel advanced workbook operations</a>   <a href="#">Example of sharing an Excel session between bots</a></p>
<p><b>New option for Run Task</b></p> <p>In the Task Bot package, you can now use the <b>Run</b> action with an option to repeat the selected task until you choose to stop it.</p>
<p><b>New search for roles in User Management API</b></p> <p>Use the new <code>Search for roles</code> API in the User Management APIs in Swagger to obtain a list of all the roles or details for a specific role.</p> <p><a href="#">Search for roles API</a></p>
<p><b>Capture response status of REST API</b></p> <p>In the REST Web Service package, you can capture the response status of the REST API in the dictionary variable. The dictionary variable now shows the response key with its value.</p>
<p><b>New option for REST Web Service</b> (Service Cloud case ID: 00489741, 00646436)</p> <p>Use the <b>Capture failure response</b> action in the REST Web Service package to capture response details in the response body.</p>

**New features****Use regular expressions in packages**

You can use regular expressions (regex) in certain actions to support pattern-based search in a file, folder, or Windows title. Regular expressions are supported in the actions of the File and File and Folder packages such as **Copy, Delete, Rename, Print Multiple files,** and **Zip**.

You can also use regular expressions in some packages that support the wildcard character in their window titles.

The following packages and actions support regular expressions:

- Wait
- Image Recognition
- Simulate keystrokes
- Mouse > **Click** action
- Legacy Automation > **Manage windows control**
- OCR
- Screen
- Recorder > **Capture**
- Run DLL > **Run function (Legacy), Run function**
- Window: **Activate, Close, Maximize, Minimize, Resize**

[Using Copy action for file](#) | [Using the Capture action](#)

**Support for overloaded functions in DLL package**

The **DLL > Run function** action can now handle `.dll` files that contain multiple functions of the same name. The action calls the function based on the number of parameters passed.

[Using the Run function action](#)

**New actions for SAP captured objects**

Use new actions that are available for **Tree, Tab,** and **Label** controls to perform operations for the various objects captured from an SAP application.

[Actions supported in various SAP versions](#)

## New features

### Enhancements to elements in the form builder

- **Image** element: Upload image files to the form using this element.

*Using the Image element*

- **Button** element: Validate all the fields in a form using the **Validate all form fields when this button is clicked** option.

*Using the Button element*

- **Password** element: Use one of the following formatting options:

- **Standard**: set the character limit and choose additional security options.
- **Custom**: add a custom password on the **Regular expression** page.

*Using the Password element*

- **Rich Text Editor** element: Use this element in the **Set** action when creating a bot in order to add or overwrite the value of a variable.

- **Table** element: Includes the following updates:

- New data types for **Column settings**:

- Date
- Number
- Dropdown

- The following actions, which you can use during bot runtime:

- **Set** action to add rows to the table.
- Trigger events to add rows and delete rows.
- Sort table columns.

- **Text Box** element: Choose one of the following formatting options:

- **Standard**: set the character limit for this field.
- **Custom**: add a custom password on the **Regular expression** page.

*Using the Text Box element*

- **Select file** or **Snapshot** element: When you click **Preview** during bot runtime, the system default application is used to display the selected file.

*Using the Select File element | Using the Snapshot element*

### Enhancement to List view of bots

In the **List** view of the Bot editor, you now drag a selected action to the task logic.

## New features

### Import 11.x bots to Enterprise A2019 (Service Cloud case ID: 00512847)

- **BLM Import feature:** The Bot Lifecycle Management (BLM) import feature enables you to import 11.x bots from multiple 11.x Control Room instances to a single Enterprise A2019 instance by using the `aapkg` file.

[Bot Lifecycle Management](#) | [Import bots](#)

- **BLM Import API:** You can also use this API to import 11.x bots to the Enterprise A2019 instance by uploading the `aapkg` file. However, you can import a password-protected `aapkg` package only by using the Import API.

[Bot Lifecycle Management API](#) | [Import files using API](#)

### New endpoint in License API

Use the **List details of Control Room licenses** endpoint to retrieve metadata including the license type, number of available licenses, number of licenses used in a specific Control Room instance, and number of licenses used in all Control Room instances.

[License API](#) | [List details of the Control Room licenses](#)

### Programmatically manage device login credentials

Use the **Login setting** endpoint of the Credential Vault API to set or update the device login credentials to allow bots to run on the device.

[Set device login credentials API](#)

### Store multiple lines of text in a string variable

You can use a string variable containing multiple lines of text in the following actions:

- **String > Assign**
- **String > Extract text**
- **String > Compare**
- **String > Lowercase**
- **String > Replace**
- **String > Reverse**
- **Log to file**
- **Message box**
- The string condition in the **If**, **Wait**, and **While** actions

### Arabic, Japanese, and Russian characters supported in variable names

You can now create variables with names containing Arabic or Russian characters, or Japanese double-byte numbers.

[Unicode range supported in variables](#)

Changed features
<p><b>Configure granular security for Bot agent</b> (Service Cloud case ID: 00653807)</p> <p>Starting from this release, only registered Bot agent device IP addresses that are added in the <b>Allowed IP addresses</b> list of the <b>Network Settings</b> can connect to the Control Room. In previous releases, devices from all subnets and IP addresses within the corporate network were allowed to connect to the Control Room URL.</p> <p><a href="#">Network access</a></p>
<p><b>Update to Excel advanced package</b></p> <p>The <b>Open</b> action in the Excel advanced package now opens a Microsoft Excel spreadsheet even when a file extension is not provided.</p>
<p><b>Disable clone and view content permissions for check-in</b> (Service Cloud case ID: 00656157)</p> <p>When the <b>Check in</b> permission is selected, the <b>Clone</b> and <b>View content</b> permissions are also automatically selected. As a Control Room administrator, you can now disable the <b>Clone</b> and <b>View content</b> permissions when required.</p>
<p><b>Associate triggers with unattended Bot Runners</b></p> <p>Ensure that the default device is not in locked state if you are associating triggers with unattended Bot Runners.</p>
<p><b>Additional license support enhancements</b></p> <p>Control Room administrators are enabled to install a new GUID license before an existing license expires.</p>
<p><b>Change in edit device permission</b></p> <p>Starting from this release, the permission to edit devices is not available in the system-created <b>AAE_Basic</b> role by default in the Control Room. A user has to select the <b>Edit the device(s)</b> permission separately.</p> <p><a href="#">Devices</a></p>

The following table lists the fixed features and the builds in which they were fixed (Build 7103 is the latest build, and Build 7096 is the previous build). The fixes are cumulatively available in the latest build.

Fixed features		
Build number	Service Cloud case ID	Description
7103	00684905, 00703481	A TaskBot now runs as scheduled and no longer shows the device status as <b>Picked at runtime</b> on the <b>View task in progress</b> (Activity) page when the TaskBot is running.
7103	00676476	An error is no longer encountered when you run a child bot that contains a Japanese full-width space character in the name.

Fixed features		
Build number	Service Cloud case ID	Description
7103	00689935, 00689381, 00690368, 00690217, 0069053	License server syncing error generated when control room licenses and licenses stored on a server are updated on different schedules. This issue has been fixed. Should an error message appear, click "Sync licenses from Server" for any new licenses in production to manually sync the licenses.
7096	00667396, 00670001, 00653771, 00671553	Bot Scanner no longer encounters an error when scanning bots with non-ASCII characters in their name.
7096	00659334	The <b>Offset from match</b> option in the Image Recognition package now works correctly in migrated bots.
7096	00669166	You can now migrate large bots (for example, with 30+ dependencies and 500+ lines) using the Bot migration package. The system no longer encounters an error when migrating a bot that contains a large number of nested IF/ELSE commands.
7096	00659349	You can now migrate bots with special characters in their names.
7096	00670985, 00674145	The system no longer encounters an error due to Bot Store credentials when you migrate from Version 11.3.3 or a later version to Enterprise A2019.
7096	00679817	An <code>unknown</code> error is no longer displayed when you are migrating a bot that the Bot Scanner listed as ready for migration.
7096	00457898, 00488494	You can now register a device with a username that contains non-ASCII characters such as Korean language characters.  <b>Note:</b> Before upgrading the Bot agent to the current version, ensure that the registered device is configured to use non-ASCII characters.  <a href="#">Configuring post-installation settings</a>

Fixed features		
Build number	Service Cloud case ID	Description
7096	00611887	You can now download an exported bot package using the Internet Explorer browser by opening the download link received in the email. You can also do this from the <b>Activity &gt; Historical</b> page.
7096	00647932	When you create a bot using the <b>Get method</b> action in the REST Web Service package, the UTF-8 character set is now supported. Therefore, Korean characters are processed correctly in the REST API response. Previously, UTF-8 characters were not supported.
7096	00641126	You can now use the <b>Get single cell</b> action in the Excel basic package to extract the date correctly for the Japanese date format. Previously, the Japanese date was displayed in double quotation marks.
7096	00634102	You can now use the Simulate keystrokes package with the Alt+F4 key and set a longer delay value between each keystroke. Previously, the bots displayed an error when a longer delay value was set with the Alt+F4 key.
7096	00655739	In REST Web Service, the Rest API Get call now works properly even when the encoded URL string has special characters such as double quotation marks. Previously, the Rest API Get call failed when the URL string had double quotation marks.
7096	00653944	The String package now shows the correct output when you use the loop action to read a file name that does not have an extension. Previously, when the file did not have any extension, the filename extracted using the loop displayed an incorrect output.
7096	00677941	When an optional field ( <b>Mark field required</b> is not selected) is now left blank, a form is validated without any error messages during bot runtime.

Fixed features		
Build number	Service Cloud case ID	Description
7096	00662011	When using the files and folders trigger, you can now use any available network drive to start a bot.
7096	00666441, 00673888	For a folder trigger, you can now select a folder name containing a space character and the bot runs successfully without encountering any issues.  For example, you can select a folder called 'Sales chart'.
7096	00622100	When <b>Simulate keystrokes</b> is enabled for a hot key trigger, you can now start a bot multiple times using the associated hot keys without encountering any issues.
7096	--	If an element is marked as <b>Read-only</b> on the form builder screen, a validation error is no longer displayed for that field during bot runtime.
7096	00570660	You can now use Windows forms with the <b>Run function</b> action of the DLL package.
7096	00624644	The system no longer encounters an error when you upgrade from an earlier version of Enterprise A2019 to a later version when the settings are preserved and the installation path is not the default location.
7096	00670008	You can now pause or resume a task from the <b>Activity &gt; In progress</b> page.
7096	00667210, 00672875	In the Excel advanced package, you can now use the <b>Go to cell</b> action even if the Excel sheet does not have any data or an active cell is out of the worksheet range. Previously, an issue was encountered when you used the <b>Go to cell</b> action and chose the cell option as <b>Active cell</b> with the <b>Beginning of the row, End of the row, Beginning of the column, or End of the column</b> option.

Fixed features		
Build number	Service Cloud case ID	Description
7096	00659098, 00669437	You can now edit the <b>Start date</b> of an existing schedule to today's date, provided the start time is set before the bot is scheduled to run.
7096	00671392	You can now stop a bot that is in progress using the <b>Stop</b> option from the <b>In progress (Activity)</b> page or the <b>Stop</b> option on the runtime window that appears when the bot is being executed.
7096	00647761	You can now define a list variable of subdata type Boolean or datetime within an action. Previously, the bot encountered an error in this scenario.
7096	00671478	Fixed an issue in the <b>Task Bot &gt; Run</b> action where the value of an input variable disappeared when the user clicked <b>Save</b> . This issue only occurred when the <b>Current Task Bot</b> option was selected.
7096	00663719, 00635437	Fixed an issue where the OCR package was missing from Control Room instances hosted on Microsoft Azure. The connection with the Microsoft Azure database timed out before the OCR package .jar file could complete the upload.
7096	00631133, 00636174	In the Wait package, the <b>Wait for condition</b> action in the recorder object no longer waits indefinitely during bot execution. If the required window or its control does not exist, the bot waits for the required window or its control for the time specified in the <b>Wait for control</b> field. If the required window or its control is not found within this specified time, the bot continues to perform the next set of actions.

Fixed features		
Build number	Service Cloud case ID	Description
7096	00628863	Bot files or dependencies are no longer lost when you check in or check out a bot from the private or public workspace when the Elasticsearch service is running and not in index read-only mode. Previously, an error occurred when a bot was either checked in or checked out, and the bot files or dependencies were lost and could not be recovered.
7096	00673520	When a bot is deployed through RDP with a predefined screen resolution, the RDP resolution settings are now applied correctly during bot execution. Previously, the bot was executed with an interchanged resolution (the height and width pixels were interchanged).
7096	00670346	After you edit a bot schedule, the input value of a variable in the bot no longer has to be reinitialized and the bot does not show the default output value for the variable when it is executed.
7096	00653056, 00651853, 00647949, 00657465,00670024	The <b>In progress</b> activity is now displayed correctly for bots deployed on Bot Runners by any user.
7096	--	<p>When developing custom packages, you can now set your name in the vendor column. To set the name, update the <code>author</code> property of the <code>build.gradle</code> file, as shown below:</p> <pre>packageJson{   artifactName =     project.name   group = "\$groupName"   author = "&lt;entername&gt;" }</pre> <p>Leaving the field empty shows the vendor name as unspecified.</p>
7096	--	Multiple users can now simultaneously run a bot associated with a form without encountering any issues on the same Bot Runner machine.

Fixed features		
Build number	Service Cloud case ID	Description
7096	--	You can now migrate 11.x bots that contain variables that are in a different letter case (uppercase or lowercase) than those in Enterprise A2019. Variables are case-sensitive in Enterprise A2019 but not in 11.x, which previously resulted in an error.
7096	00592758	You can now create a variable with a name that starts with a numerical character.
7096	00670994	You can now register with the Control Room from a multiple-user device configured for Active Directory users.
7096	00677479	The deployment time of a priority queue no longer takes a long time (for example, more than 1 hour) to process Work Items required for workload automation.
7096	00667110	You no longer have to restart the Automation Anywhere Bot agent service to resume queued Work Items that are stuck in in-progress state.
7096	00673043	When you specify a value in the numOfRunAsUsersToUse parameter of the Bot Deploy API, the weighted system algorithm now assigns tasks to the Bot Runners with the least number of tasks queued and currently running. Previously, the algorithm did not correctly calculate the weight of queued and running tasks, which resulted in an inefficient task allocation to the same one or two Bot Runners.

Known limitations
When a bot opens a website inside a loop, the Recorder <b>Capture</b> action fails after the execution of Launch Website. <b>Workaround:</b> Add a delay of a few seconds in the loop between the Launch Website and Recorder <b>Capture</b> action.
The Recorder <b>Capture</b> action does not support object recapture for the AISense technology type.
The system does not display a value for a session variable when the variable is selected as <b>Watched variables</b> in <b>Debug</b> mode.

Known limitations
The session variable returns a blank value when it is used as output in a bot and the bot is deployed using the Bot Deploy API.
After an upgrade to the latest version of Enterprise A2019, the bot might encounter an error if you are using the <b>Close</b> action of the <b>Window</b> package version 2.1.0-20200813-181240 or earlier. <b>Workaround:</b> Add a delay of 50 milliseconds after the <b>Close</b> action in the bot.
The Recorder package takes a long time (for example, approximately 6 hours) to upload to a remote application repository path of an On-Premises Control Room deployed on Microsoft Azure. <b>Workaround:</b> <ol style="list-style-type: none"> <li>1. Before you install or upgrade to this version, configure the repository path in a local directory of the Control Room node to upload the package.</li> <li>2. After installing or upgrading, verify that all packages are available in the <b>Packages</b> page of the Control Room.</li> <li>3. Change the repository path to a remote file share.</li> </ol>
The AISense Recorder fails if you manually upgrade the Recorder package version, such as by importing a bot that contains a Recorder package version from a more recent build than the destination Control Room. Always upgrade the Recorder package through the Control Room.

## Automation Anywhere Robotic Interface (AARI)

New features
<p><b>Run a process in private workspace</b></p> <p>You can now run a process in your private workspace by using the <b>Run</b> option in the process editor. The bots in the process are then executed on the default device of the Bot Creator.</p> <p><a href="#">Configure processes</a></p>
<p><b>Use the Data Privacy tag field</b></p> <p>The <b>Data Privacy tag</b> enables users to generate hidden custom output in their process tasks (<b>Start</b> panel, <b>Human Task</b>, and <b>Bot Task</b>). Users can enter the variables for this field during runtime with values. In the web portal, the AARI admin can use this tag to check for requests or tasks by using personal user data. The admin can also filter using this field.</p> <p><a href="#">Create an AARI process</a>   <a href="#">Filter and search for a request</a>   <a href="#">Filter and search for a task</a></p>
<p><b>Use variables types</b></p> <p>You can now use new variables in the process editor such as <b>createdOn</b> and <b>updatedOn</b> (DateTime), <b>id</b> (Number), and <b>title</b> (String). These variables are part of a data flow (workflow engine) that moves data between each step of a process and requires variable input for the process to run properly.</p> <p><a href="#">AARI variable types</a></p>

New features
<p><b>View previous selected tasks</b></p> <p>AARI users can now reference selected actions of their tasks. When they view a submitted task in request view, a check mark indicator is now displayed next to the buttons that are selected.</p>
Changed features
<p><b>Configure scheduler user to allocate device pool to AARI on the web interface</b></p> <p>In the <b>AARI Settings</b> page, the AARI administrator can now configure a scheduler user to allocate the Control Room resources (devices and unattended Bot Runners) to AARI on the web interface.</p> <p>The scheduler user must have <b>View my bots</b> and <b>Run my bots</b> permissions and have access to a device pool and Bot Runners. The AARI process can then use those resources for each bot deployment.</p> <p><a href="#">Configure scheduler user for AARI on the web</a></p>
<p><b>End point display</b></p> <p>In the <b>Completed</b> panel, the <b>End point</b> has a new display option <b>Update request title</b> that enables the user to update the request title. When the user updates the <b>Display message</b> field, the update is now reflected in request view.</p> <p><a href="#">Create an AARI process</a></p>
<p><b>Use F2 to insert variables</b></p> <p>You can now use the F2 keyboard shortcut to insert variables in the process editor.</p>

Fixed features	
Service Cloud case ID	Description
--	The <b>Task display name</b> option in the <b>Start</b> panel is now set to <b>Request Creation</b> by default. Any name changes by the user is now reflected in the request view.
--	The <b>Feed data into form</b> table in the process editor now works properly and users can now edit the field.
--	In a form that contains a <b>Number</b> field set to a 10-character limit, when you enter the maximum character limit (for example, 1234567890) in the number field in request view, the number values are now accepted.
--	When you create a process with a form that contains a <b>Date</b> element, the <b>Condition</b> option in the <b>If/Else pair</b> action now allows you to enter a variable. Previously, the option did not allow you to enter a variable.

Known limitations
<p>In the process editor, if a bot contains an incorrect input variable, the properties panel highlights the wrong element: <b>Browse</b> in the <b>Select Task Bot</b> field is highlighted instead of the incorrect variable.</p> <p><b>Workaround:</b> Hover your mouse over the red icon next to the <b>Bot Task</b> in the process editor to see the error.</p>
<p>In the process editor, if you replace the <b>Go to</b> option with an <b>End Process</b>, the <b>End Process</b> icon does not display the status (Completed, Failed, Canceled) correctly.</p> <p><b>Workaround:</b> Click the <b>End Process</b> icon and change the status.</p>
<p>A <b>Bot Task</b> cannot pass data to the next task (<b>Human Task</b> or <b>Bot Task</b>) if it contains Japanese characters in its output variable name.</p> <p><b>Workaround:</b> Use English characters for the variable name in the <b>Bot Task</b>.</p>
<p>If a scheduler user has multiple sets of configurations (device pools and Bot Runners), due to a mismatch in the selection of the device pool and the Bot Runners, the bot deployment fails.</p> <p><b>Workaround:</b> Set Bot Runners in the <b>Run As</b> section of the consumer role. Ensure the scheduler user has access to only one device pool and one consumer role that has run-as users.</p>
<p>When you access AARI through the web interface, the <b>Request ID</b> and <b>Task ID</b> consider the data as string type instead of numeric data type and sorts it accordingly.</p> <p>For example, if a <b>Request ID</b> or <b>Task ID</b> starts from 1 through 30, the IDs are sorted as string data type (1, 10, 11, 12, 13, ..., 2, 22, 23, ..., 30) instead of numeric data type (1, 2, 3, 4, ..., 30).</p>
<p>In some bot development failure scenarios, for example, files are not found or the scheduler user does not have access to the bot file, bot development fails by timing out after one hour instead of displaying an error.</p>
<p>If an AARI manager creates a team with the same name as a team created by any other manager, no error message is displayed and two teams are created with the same name.</p>
<p>When you access AARI through the web interface, the task and case list pages do not display the following words in the localized languages:</p> <ul style="list-style-type: none"> <li>• Search task</li> <li>• Results</li> <li>• Request title</li> </ul>
<p>In the process editor page, the following words are not displayed in the localized languages:</p> <ul style="list-style-type: none"> <li>• Process entry</li> <li>• Run</li> <li>• Undo</li> <li>• Redo</li> <li>• Data privacy tag</li> <li>• Auto assign this task to</li> <li>• InitialData</li> <li>• Update request title (optional)</li> <li>• Update task name (optional)</li> <li>• Boolean condition</li> </ul>

## Discovery Bot

New features
<p><b>Column headers updated in Recordings page</b></p> <p>The <b>Recordings</b> page now displays labeled column headers when you review captured steps for recordings. The following headers are displayed for the associated text field:</p> <ul style="list-style-type: none"> <li>• Screenshot</li> <li>• Application</li> <li>• Data</li> <li>• Step description</li> </ul> <p><i>Record a Discovery Bot business process</i></p>
<p><b>Highlight where you click or enter data when recording processes</b></p> <p>The system now displays the area, component, or control where you click or enter data with a red highlighted box at the time of recording.</p> <hr/> <p><b>Note:</b> The red highlight is only shown in the captured screenshot in the generated bot. The highlight is not shown on captured screenshots from the <b>Recordings</b> page for review and after submission to the analyst. The highlight is also not shown from the preview pane from the <b>Aggregated</b> and <b>Opportunity</b> tabs for the analyst review.</p> <hr/> <p><i>Supported applications and browsers for Discovery Bot</i></p>
<p><b>Condition and value displayed for each branch in Aggregated view</b></p> <p>For the <b>System generated</b> view, the condition and its value for each branch are automatically retrieved and displayed as part of the auto-generated Aggregated view.</p>
<p><b>System-generated aggregation</b></p> <p>You can now merge multiple recordings into a single aggregated view automatically by selecting the required set of recordings.</p> <p><i>Create a process view with branches and opportunities</i></p>
<p><b>Convert system-generated aggregated view to a manual view</b></p> <p>You can now convert a system-generated aggregated view to a manual view using the <b>Save as [manual]</b> option or the <b>Convert to Manual</b> option from the <b>Views</b> table. This option enables you to add more recordings or steps from other recordings to your process view.</p> <p><i>Create a process view with branches and opportunities</i></p>
<p><b>Create an opportunity, including all steps and branches</b></p> <p>You can now use the <b>Select all steps</b> option to create an opportunity that includes all steps, branches, and sub-branches.</p> <p><i>Create a process view with branches and opportunities</i></p>

New features
<p><b>Download a process definition document (PDD) (previously, Export to Word)</b></p> <p>The <b>Export to Word</b> option is now renamed as <b>Download Process Definition Document (PDD)</b>. When an opportunity is created, the PDD begins processing in the background automatically. When the PDD is ready for download from the Control Room, an email notification is sent to the email address on file to the opportunity owner.</p> <hr/> <p><b>Note:</b> You must be the owner of the opportunity to be able to download the PDD.</p> <hr/> <p><a href="#">Review opportunities and convert to bot</a></p>
<p><b>Receive email notification when your bot is converted successfully</b></p> <p>You can now receive an email notification when your bot is successfully converted. Click the hyperlink in the email to take you to your folder in which the bot was generated.</p> <hr/> <p><a href="#">Review opportunities and convert to bot</a></p>

Changed features
<p><b>Zoomed-in view of captured steps is increased</b></p> <p>The zoomed-in view in the <b>Screenshot</b> field is now increased from x4 to x8 for better readability of captured steps.</p>
<p><b>Permissions layout</b></p> <p>The layout of the permissions for Discovery Bot is now changed to separate the individual and "all" permissions to easily manage access control.</p>

Fixed features	
Service Cloud case ID	Description
--	When you create a branch in a view, typically a single step from the current branch is moved into the left branch while a new branch with an empty box is added to the right branch. You can add steps from a different recording only into the empty box in the right branch. Typically, only one step from the original branch is included in the left branch. If the branch is created following the last step in the flow, then no steps will be included in the left branch. You can now add new steps to the left branch in case it was the last step. You can also move the endpoint of the newly created branch lower or higher in the process to include additional steps in the left branch.

Known limitations
In the <b>Opportunities</b> tab, the process and owner column does not allow you to sort in ascending or descending order, or when you sort for both process and owner.

Known limitations
In the <b>Opportunities</b> tab, the search field and the filter drop-down option do not work when you search for the <b>Process</b> or <b>Owner</b> columns.
The <b>Download PDD</b> option is disabled if you are not the owner of the opportunity.
The <b>Delete</b> icon is not properly visible in the edit recordings screen in Internet Explorer. Two-finger swipe on the track pad does not change the zoom level in any canvas of the <b>Aggregated</b> and <b>Comparison</b> tabs.
Discovery Bot is currently not supported on Linux.
The red highlight is only shown in the captured screenshot in the generated bot. The red highlight is not shown on captured screenshots from the <b>Recordings</b> page for review and after submission to the analyst. The highlight is also not shown from the preview pane from the <b>Aggregated</b> and <b>Opportunity</b> tabs for analyst review.

## IQ Bot

New features
<p><b>Support for Arabic language</b></p> <p>When creating a learning instance, you can now choose the Arabic language from the <b>Primary language of documents</b> drop-down menu, with the following limitations:</p> <ul style="list-style-type: none"> <li>• Advance table extraction is not available.</li> <li>• Search field on the <i>Validator</i> is not supported.</li> <li>• Arabic numerals are not supported.</li> </ul> <p>For example, if the document has date or time in Arabic language, it is extracted as text and validations can fail.</p> <hr/> <p><b>Note:</b> You can still use string-based validation checks (such as regular expressions) for Arabic numerals.</p> <hr/> <ul style="list-style-type: none"> <li>• Arabic is only supported on ABBYY FineReader Engine 12.4.</li> </ul> <p><i>Creating a learning instance</i></p>
<p><b>Default validations for a group</b></p> <p>When editing a learning instance, you can now use the <b>Select the default validations group</b> drop-down menu to select an available group. This allows all the new group documents in production to be extracted based on the custom logic and validations defined in this selected group, before it goes to the Validator.</p> <p><i>Edit a learning instance</i></p>

Changed features
<p><b>Automatically detect check box</b></p> <p>IQ Bot can now automatically detect check boxes and radio buttons in a document. You can enable this feature when creating a learning instance.</p> <p><i>Creating a learning instance</i></p> <ul style="list-style-type: none"> <li>• With this feature enabled, during training, if you select <b>check box</b> from the <b>data type</b> drop-down list and then you select the <b>field value</b>, only the check box segments are displayed.</li> <li>• This feature does not work with the PDFBox option enabled.</li> </ul> <p><i>Disable PDFBox option</i></p>
<p><b>Tegaki API OCR improvements</b></p> <p>IQ Bot now uses enhanced Tegaki API OCR segmentation to improve accuracy in the following scenarios:</p> <ul style="list-style-type: none"> <li>• Multiple fields are merged into a single SIR</li> <li>• Segmentation on empty spaces</li> <li>• Overlapping SIRs</li> <li>• Incorrectly located SIRs</li> <li>• Partial or incorrectly captured values from SIRs</li> </ul> <p><i>IQ Bot Tegaki API OCR engine</i></p>
<p><b>Updated versions of RabbitMQ and Erlang/OTP</b></p> <p>The IQ Bot installation package now includes RabbitMQ version 3.8.8 and Erlang/OTP version 23.0.4.</p> <p><i>RabbitMQ and Erlang/OTP upgrade</i></p>
<p><b>PyArabic removed from Python installation</b></p> <p>PyArabic is one of the Python libraries that was used in content extraction for Arabic language (right to left). Because Arabic language is now supported by default with IQ Bot installation, PyArabic is removed from Python installation.</p> <p><i>List of Pandas Libraries which are supported and not supported on Automation 360 IQ Bot (A-People login required)</i></p> <hr/> <p><b>Note:</b> Ensure you update any bot that you have deployed using PyArabic.</p> <hr/>
<p><b>Performance improvement</b> (Service Cloud case ID: 00629302)</p> <p>IQ Bot now takes significantly less time to create a bot for groups containing only production documents.</p>

Fixed features	
Service Cloud case ID	Description
00500914	<p>The TesseractLog.log file is now available in the following directory: C:\Users\Public\Public Documents\Automation Anywhere IQBot Platform\Logs\Engine\.</p> <p>The log level is set to <code>error</code> by default. You can change this setting in the <code>CognitiveServiceConfiguration.json</code> file.</p>
00430923, 00618234, 00636422, 00478986, 00414921	All uploaded documents are now rendered correctly, irrespective of their content orientation while uploading, which enables you to train them without encountering any issues. Previously, when you created a learning instance, documents that did not have the correct content orientation (they were upside down or tilted) could not be trained.
00653929	IQ Bot On-Premises: With segmentation improvements, you can now train documents in the Korean language using the Tegaki API OCR engine without any system-identified region (SIR) errors.
--	The system no longer creates any unnecessary folders for successfully classified documents that are uploaded using the IQ Bot [Local Device] package.
--	You can now use the designer page when creating a learning instance to test all the documents, without any error messages.
00590165	For a learning instance, you can now use the <b>See extraction results</b> option to browse all the documents in the selected group.
00672470	After validating the fields of production documents, you can now use the <b>Save current document</b> option to save all the validated document, without any error messages.
--	Check box fields are now extracted with better accuracy. You can use the <b>Checkbox auto-detection</b> feature so that IQ Bot automatically detects the check box fields and radio buttons.
00652269, 00619139	When you now run a bot and try to edit it while it is still running, the following correct message is displayed: <pre>Staging Documents for this Vision bot is in progress. Please try after some time.</pre> Previously, the following incorrect message was displayed: <pre>Learning instance not found.</pre>
00601401	When creating a learning instance, you can now use the Thai language for form and field names without encountering any issues.
00624416	When you migrate a learning instance, group descriptions are now migrated without any errors.

Fixed features	
Service Cloud case ID	Description
--	If you select any field on the Validator screen, the focus from that field is no longer lost when you now click or draw to select SIR.
00662968	Sometimes, when you click <b>See Extraction Results</b> and the preview fails, IQ Bot now correctly displays the following error message after a timeout of 2 minutes: <code>Error occurred while extracting the document. Please re-check the training/document. Previously, when the preview failed, the page kept loading indefinitely.</code>
00674110	Production documents are now moved to the <i>Validator</i> without any errors, irrespective of how the bot was trained (number pages, number of segments in each page, or number of tables and fields extracted).

Known limitations	
IQ Bot On-Premises and Cloud	In the table area of the Validator, if you add a new row, enter a value, and then delete this row, the value of the next row is replaced by the content you entered in the deleted row.
IQ Bot On-Premises and Cloud	In the Validator, when you click any validated field and then click any other cell, the value in the validated field is deleted.
IQ Bot On-Premises and Cloud	When you upload a document to production immediately after deleting a bot it was associated with, extraction results are not displayed. <b>Workaround:</b> Use one of the following options: <ul style="list-style-type: none"> <li>• Select the <b>Disable cache</b> option in the <b>Network</b> tab.</li> <li>• Ensure you wait at least 3 minutes between deleting the bot and uploading the document.</li> <li>• Empty the cache and reload the page.</li> </ul>
IQ Bot On-Premises and Cloud	You cannot use <b>Express</b> mode to install IQ Bot.
IQ Bot On-Premises and Cloud	Numerals in the Polish language are not accepted or validated in the Validator.
IQ Bot On-Premises and Cloud	If you create a user role with 2-byte non-English characters, services fail with an <code>invalid characters</code> message.
IQ Bot On-Premises and Cloud	If the name of a learning instance has both English and Arabic characters, the time stamp of the backup file is appended in between the filename.

Known limitations	
IQ Bot On-Premises and Cloud	You cannot use the draw functionality to generate an SIR when you zoom in on a document in the Validator.
IQ Bot On-Premises	After installing IQ Bot, MLWeb services stops responding. <b>Workaround:</b> Manually stop and restart the MLWeb services.
IQ Bot On-Premises	If you add a new language after upgrading to IQ Bot A2019, the <b>Learning Instance</b> page is not displayed due to Language API cache issues. <b>Workaround:</b> Clear the cache and restart the IQ Bot service.
IQ Bot On-Premises and Cloud	If you try to process a PDF document with <b>pdfboxOCR</b> enabled, the SIRs are not placed correctly on the check boxes. <b>Workaround:</b> Disable the pdfbox OCR when you create a learning instance.
IQ Bot On-Premises and Cloud	If you create a learning instance with <b>Auto Checkbox Detection</b> enabled, check box SIRs cannot be selected. <b>Workaround:</b> Draw on top of the check box SIR instead of selecting the identified SIR field.
IQ Bot On-Premises and Cloud	Starting with IQ Bot A2019.17, the default OCR engine is changed to ABBYY FineReader Engine 12.4 from the previous 12.2 version. Therefore, if you have migrated learning instances from earlier versions, you might have to retrain your bots because there could be a change in segmentation.

## Bot Insight

New features	
<b>New AARI dashboard in Bot Insight</b>	
Use the AARI dashboard to view various widgets that provide information about requests created from published processes in AARI. The dashboard also provides statistics on the status of created requests. <a href="#">AARI dashboard</a>	

Security fixes	
Service Cloud case ID	Description
--	The <b>Allow Header HTTP</b> header is removed from Bot Insight.

## Supported packages

Package	Version
Application	2.1.0-20200921-085720
App Integration	1.1.0-20201014-042506
Analyze	2.2.4-20200903-113949
Active Directory	2.1.0-20200921-085716
Boolean	2.1.0-20201014-042509
Bot Migration	2.5.0-20200902-045043
Browser	2.1.0-20201002-123733
Clipboard	2.1.0-20201014-042520
Comment	2.2.0-20201014-042520
CSV/TXT	2.3.0-20201014-082525
Database	2.2.0-20201013-052941
Data Table	2.3.0-20201030-143334
Datetime	2.2.0-20201014-042531
Delay	2.2.0-20201014-042532
Dictionary	3.2.0-20201014-042532
Run DLL	3.2.0-20201105-205159
Email	3.1.0-20201104-062204
Error handler	2.2.0-20201014-042541
Excel basic	2.3.0-20201027-160012
Excel advanced	5.1.0-20201027-155758
File	3.1.0-20201016-065515
File & folders	1.1.0-20201023-202725
Folder	3.0.0-20201016-065517
FTP / SFTP	2.1.0-20200921-085757
IF/ELSE	2.1.0-20200921-085758
Image Recognition	2.1.0-20201014-042552
Interactive forms	2.17.3-20201102-103733
IQ Bot	2.1.0-20201013-095304
JavaScript	2.3.0-20201104-062431
Simulate keystrokes	2.4.0-20201021-163833
Legacy Automation	3.2.0-20201104-062439 1.3.0-20201105-151906

Package	Version
List	2.2.0-20201014-042806
Log To File	2.2.0-20201014-042806
Loop	2.1.0-20201014-042808
Message Box	2.1.0-20201014-042808
Migration	2.7.0-20201106-072418
Mouse	2.1.0-20201014-042814
Number	2.1.0-20201014-042823
OCR	2.2.0-20201104-062503
Office 365 Excel	2.2.0-20201104-062559
Office 365 Calendar	2.1.0-20200921-085726
Office 365 OneDrive	2.1.0-20201014-042924
PDF	2.5.0-20201014-042929
PGP	2.2.0-20201014-042931
Ping	2.1.0-20201014-042932
Printer	2.1.0-20200921-090131
Play Sound	2.1.0-20200921-090123
Prompt	2.1.0-20200918-081201
Python Script	2.3.0-20201105-204912
Recorder	2.0.9-20201105-164103
REST Web Service	3.1.0-20200928-231420
SAP	2.2.0-20200921-090209
Screen	2.1.0-20201014-043037
SNMP	2.1.0-20201014-043041
Service	3.0.0-20200921-090214
SOAP Web Service	3.1.0-20200921-090219
String	3.1.0-20201014-043052
System	3.0.0-20200921-090225
Task	2.0.1-20201023-202703
Terminal Emulator	3.4.0-20201028-021451
Trigger Email	1.1.0-20201105-152220
VBScript	2.3.0-20201105-205228
Wait	3.1.0-20201014-043117
Window	2.2.0-20201022-121649
Workload	2.3.0-20201105-205233

Package	Version
XML	2.1.0-20201014-043121

### Related reference

[Community Edition A2019.17 Release Notes](#)

## Enterprise A2019.16 Release Notes

*Release date: 28 September 2020*

Review the new features, supported packages, changed features, fixed features, security fixes, and known limitations in the Enterprise A2019.16 (Build 6463) release. IQ Bot is on Build 6443.

---

**Important:** We have updated Enterprise A2019.16 to Build 6463 to include fixes for issues with checking in and checking out bots (Service Cloud case ID 00666880, 00670899, 00672441, 00670455, 00672346), and Universal Recorder (Service Cloud case ID 00664020). See the [Fixed features](#) section for more information.

---

- [Enterprise A2019](#)
- [Discovery Bot](#)
- [IQ Bot](#)
- [Bot Insight](#)
- [Automation Anywhere Robotic Interface \(AARI\)](#)

## Enterprise A2019

---

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

---

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

## New features

### **Migration to Enterprise A2019 (currently available only to customers in the Migration Early Adopter Program)**

Enterprise A2019

Migration to Enterprise A2019 is currently only available to select customers through our Migration Early Adopter Program. If you are interested in learning more about this program or a timeline for when migration will be available to all customers, contact your Automation Anywhere representative.

- **11.x only**

- Migrate audit logs to Enterprise A2019.

*[Migrate 11.x audit logs](#)*

- Migrate bots that contain disabled commands that have validation errors.
- Migrate bots that contain **Delete**, **Delete All Messages**, and **Get All Messages** commands to automate an email-related task on Exchange Web Services (EWS).

- **10.x only**

Migrate user credentials to the Enterprise A2019 Credential Vault.

*[How 10.x data is copied to Automation 360](#)*

- **11.x and 10.x**

- Migrate bots that contain the **Variable Operation** command, which re-initializes the row and column index of an array variable using a variable.
- Migrate bots that run MetaBot Logic and return the values to a dictionary variable.
- Migrate MetaBots that contain DLLs that use lists, values, arrays, and two-dimensional arrays as input and output.

*[How MetaBots are migrated](#)*

- Migrate bots that contain **Send Email** with **Attach Variable** option from the Error Handling command to the Enterprise A2019 Error handler package.

*[Package mapping for migration](#)*

- Migrate bots that contain the **Image** and **Coordinates** play modes from the Object Cloning command to the Recorder package in Enterprise A2019.

*[Package mapping for migration](#)*

- Migrate bots that contain credential variables in select commands such as Active Directory, Excel, REST Web Service, and Terminal Emulator to Enterprise A2019.

For the complete list of commands, see *[Variable mapping for migration](#)*.

### **Support for using CSV and TXT files as databases**

Enterprise A2019 and Community Edition

Use the actions from the Database package to connect with and perform create, read, and update operations on the file.

*[Using Connect action for database](#) | [Database package](#)*

New features
<p><b>Universal Recorder support for standard Microsoft controls in Microsoft Silverlight</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Universal Recorder can now capture calendars, buttons, check boxes, combo boxes, date pickers, labels, links, list views, radio buttons, sliders, tabs, tables, text boxes, and trees from applications running Microsoft Silverlight version 5.</p>
<p><b>Use variable to specify a child bot to run</b></p> <p>Enterprise A2019</p> <p>Use the Control Room path in the <b>Run</b> action of the Task Bot package to use a string variable to specify the child bot you want to run.</p> <p><a href="#">Task Bot package</a></p>
<p><b>Install Bot agent in bulk using registration key</b> (Service Cloud case ID: 00616591)</p> <p>Enterprise A2019</p> <p>As an Control Room administrator, you can generate a registration key from the Control Room settings to install Bot agent in bulk on multiple devices. You can use the registration key in an installation script or as part of the Active Directory group policy for configuring the Control Room users.</p> <p><a href="#">Generate registration key to install Bot agent in bulk</a></p>
<p><b>Automatically detect proxy settings for Bot agent installation to support NTLM authentication</b> (Service Cloud case ID: 00446932, 00639773)</p> <p>Enterprise A2019 and Community Edition</p> <p>The proxy settings for a Bot agent are automatically detected if the <b>Automatically detect settings</b> option is selected in the LAN settings for a <b>System user</b> and <b>Current user</b> on the machine where the Bot agent is installed. This allows Control Room users to be authenticated using NTLM.</p>
<p><b>Restrict network access to Cloud Control Room URL</b></p> <p>Enterprise A2019</p> <p>System administrators can restrict access to the Cloud Control Room URL from only those IP addresses within the corporate network for more granular security. The Automation Anywhere Control Room provides the ability to specify a list of IP addresses or IP subnets that are allowed for Cloud Control Room URL and API access. Enterprise A2019 users with Control Room administrator privileges, such as to access <b>Administration &gt; Settings</b>, can view, add, or edit this list.</p> <p><a href="#">Add access IP addresses</a></p>
<p><b>Add Elasticsearch credentials for enhanced monitoring and alerting</b></p> <p>Enterprise A2019</p> <p>An option to provide Elasticsearch credentials is now available in the installer because the updated Elasticsearch version 7.8 configured for Control Room uses Open Distro version 1.9.0. This feature enables the server to deploy an enhanced monitoring and alerting system.</p> <p><a href="#">Add Elasticsearch credentials</a></p>

New features
<p><b>Support for Chinese, Japanese, and Korean characters in variable names</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can now create variables with names containing Chinese, Japanese, or Korean characters. You can also migrate bots that contain variables named using these characters.</p> <p><a href="#">Unicode range supported in variables</a></p>
<p><b>Support for Chinese language for Terminal Emulator</b> (Service Cloud case ID: 00500324)</p> <p>Enterprise A2019</p> <p>You can now use the simplified and traditional Chinese language with 5250E terminal DBCS models such as IBM 5555-C01 and IBM 5555-B01.</p>
<p><b>New Services package available</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the new Services package to automate operations and application services. You can start, stop, pause, resume, or to get the status of a Windows or application service.</p> <p><a href="#">Service package</a></p>
<p><b>Enhancements to the Excel advanced package</b></p> <p>Enterprise A2019 and Community Edition</p> <p>In the Excel advanced package, you can now use <b>Read value</b> from a cell. You can choose the <b>Read</b> option to read either visible text or the value from the cell. The default option is set to <b>Read visible text in cell</b>.</p> <p>For example, if the cell has \$50 as the value, then the <b>Read cell value</b> option reads the value as 50, ignoring the currency format. The <b>Read visible text</b> option reads the content along with currency format as \$50.</p> <p>This option is available for the following actions:</p> <ul style="list-style-type: none"> <li>• Get single cell</li> <li>• Get multiple cells</li> <li>• Read row</li> <li>• Read column</li> <li>• Get worksheet as datatable</li> <li>• Loop</li> </ul> <p><a href="#">Cell operations</a>   <a href="#">Row and column operations</a>   <a href="#">Loop package</a></p>
<p><b>Automate a task on a range of cells in an Excel worksheet</b> (Service Cloud case ID: 00651299)</p> <p>Enterprise A2019 and Community Edition</p> <p>In the Excel advanced package, you can perform operations on the range of cells for <b>Go to cell</b> and <b>Set Cell</b> actions.</p> <p><a href="#">Cell operations</a></p>

New features
<p><b>New condition in the If and Loop packages</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Service is running</b> or <b>Service is not running</b> condition to execute actions based on whether a particular service is running or not. For example, when you send a mail using this condition, the bot can verify if the SMTP service is running or not.</p> <p><a href="#">If package</a>   <a href="#">Loop package</a></p>
<p><b>Capture hidden objects using AISense Recorder</b></p> <p>Enterprise A2019</p> <p>Use AISense Recorder to capture hidden image buttons on the application screen.</p> <p><a href="#">Edit a task recorded using AISense</a></p>
<p><b>New operations on SAP captured objects</b></p> <p>Enterprise A2019</p> <p>Use new options that are available to perform operations such as <b>Set Focus</b> and <b>Select item by key</b> for the various objects captured from an SAP application.</p>
<p><b>Pass parameters of various types to a DLL function</b></p> <p>Enterprise A2019</p> <p>Use the new <b>Run function</b> action to pass parameters of various types to a DLL function. The <b>Run function</b> that was available in earlier versions is now renamed to <b>Run function (Legacy)</b> and enables you to pass only dictionary variable as parameter to a DLL function.</p> <p><a href="#">Using the Run function action</a>   <a href="#">Using the Run function (Legacy) action</a></p>
<p><b>Form builder updates</b></p> <p>Enterprise A2019</p> <p>The form builder now includes the following new elements:</p> <ul style="list-style-type: none"> <li>• <b>Rich text editor</b>- Enables you to add a customizable element to the form.</li> <li>• <b>Table</b>- Enables you to add tables to a form.</li> </ul> <p><a href="#">Create a form</a></p>
<p><b>Enhancements to the form preview</b></p> <p>Enterprise A2019</p> <p>When you click the <b>Preview</b> option in the form builder screen, you can drag the form. The corresponding <b>X</b> and <b>Y</b> coordinates are updated automatically.</p>
<p><b>Enhancement to the Snapshot element</b></p> <p>Enterprise A2019</p> <p>You can now create a folder if the filepath is not available or change the destination folder of the snapshot file during bot runtime.</p> <p><a href="#">Using the Snapshot element</a></p>

New features
<p><b>Update to the Interactive forms package</b></p> <p>Enterprise A2019</p> <p>Use the <b>Validate form</b> action to validate all the elements of a selected form.</p> <p><a href="#">Interactive forms package</a></p>
<p><b>New permission to view basic information about users and roles</b> (Service Cloud case ID: 00491694)</p> <p>Enterprise A2019</p> <p>The <b>View Users and Roles basic information</b> permission enables you to view the names of users and roles when you are performing various tasks in the Control Room. For example, a user must have this permission to view the roles that can be assigned to a user when creating or editing that user. After you upgrade from an earlier version to this release, this permission is granted to all existing roles.</p>
<p><b>Securely pass values in header and parameters of calls to a REST or SOAP web service</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Credential variables enable users to retrieve sensitive values from the Credential Vault and pass them to the web service. Use credential variables in the header or parameter fields of actions from the REST Web Service or SOAP Web Service package.</p> <p><a href="#">Credentials and credential variables in the Bot editor</a>   <a href="#">REST Web Service package</a>   <a href="#">SOAP Web Service package</a></p>
<p><b>Return system parameters of the device on which a bot is running</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Get environment variable</b> action from the System package to return the system parameters, including HomePath, ProgramData, ProgramFiles, SystemRoot, and UserDomain.</p> <p><a href="#">Environment variables for System package</a></p>
<p><b>Remove Git integration configuration</b> (Service Cloud case ID: 00633948)</p> <p>Enterprise A2019</p> <p>You can now remove or disable a Git integration configuration from your Control Room when the bot information stored in your Control Room does not have to be synchronized with the remote Git host.</p> <p><a href="#">Remove Git integration configuration</a></p>
<p><b>Expanded data type support in DLL package</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The DLL package now accepts table variables as input parameters or to hold action output.</p> <p><a href="#">Using the Run function (Legacy) action</a></p>
<p><b>Create variable within Dictionary &gt; Assign and List &gt; Assign actions</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The <b>Assign</b> action from the Dictionary and List packages now offers users the option to create a new variable within the <b>Select source variable</b> field. Previously, users could only select a variable from a list of existing variables.</p>

New features
<p><b>New API for license management</b></p> <p>Enterprise A2019</p> <p>The License API contains endpoints to retrieve Control Room license details (such as the expiration date and license mode) and to update the Control Room after license reallocation or renewals.</p> <p><a href="#">License API</a></p>
<p><b>New expression in the Legacy Automation package</b></p> <p>Enterprise A2019</p> <p>The <b>List to table</b> expression supports migrated bots containing a variable that has to be converted from a list type to a table type.</p> <p><a href="#">Legacy Automation package</a></p>
<p><b>Multi-user device sessions on terminal servers</b></p> <p>Enterprise A2019</p> <p>Multi-user device sessions are now supported on terminal servers. You can perform the following actions:</p> <ul style="list-style-type: none"> <li>• Set screen resolution at either the device or Control Room level.</li> <li>• Set a multi-user device as the default device for Bot Creator users and attended and unattended Bot Runner users.</li> <li>• As a licensed user (with a default device), set another device as your default device using the <b>Make default device</b> option from the device menu.</li> <li>• View and edit the device settings on the device landing page.</li> </ul> <p>The device landing page shows additional information about the user-provided device name (device nickname), device type, and the default user.</p> <ul style="list-style-type: none"> <li>• Convert an existing device to a multi-user device in order to share the same device between Bot Runner and Bot Creator users who can then coexist in different sessions simultaneously. (Service Cloud case ID: 00624046)</li> </ul> <p><a href="#">About multi-user devices</a>   <a href="#">Convert an existing device to a multi-user device</a>   <a href="#">Configure RDP-based deployment for multi-user devices</a></p>

Supported packages	
Package	Version
Node Manager	14.1.7079
Application	2.1.0-20200819-064505
App Integration	1.1.0-20200825-070948
Analyze	2.2.4-20200903-113949
Active Directory	2.1.0-20200825-070945
Boolean	2.1.0-20200831-031000
Bot Migration	2.5.0-20200902-045043
Browser	2.1.0-20200825-071008
Clipboard	2.1.0-20200831-031014

Supported packages	
Package	Version
Comment	2.1.0-20200831-031015
CSV/TXT	2.3.0-20200825-071131
Database	2.1.0-20200913-060112
Data Table	2.1.0-20200831-031946
Datetime	2.2.0-20200831-031025
Delay	2.2.0-20200831-031026
Dictionary	3.2.0-20200831-031027
Run DLL	3.0.0-20200831-110441
Email	3.0.0-20200901-105426
Error handler	2.1.0-20200831-031055
Excel basic	2.1.0-20200831-031843
Excel advanced	5.0.0-20200909-124042
File	2.2.0-20200831-031057
File & folders	1.1.0-20200907-073046
Folder	2.2.0-20200831-031100
FTP / SFTP	2.1.0-20200825-071155
IF/ELSE	2.1.0-20200825-071156
Image Recognition	2.1.0-20200825-071159
Interactive forms	2.16.0-20200914-151814
IQ Bot	2.1.0-20200901-105449
JavaScript	2.1.0-20200831-031525
Simulate keystrokes	2.3.0-20200901-093759
Legacy Automation	3.1.0-20200831-031532 1.1.0-20200825-071342
List	2.2.0-20200831-031539
Log To File	2.2.0-20200831-031539
Loop	2.1.0-20200831-031540
Message Box	2.1.0-20200831-031541
Migration	2.5.0-20200902-045043
Mouse	2.1.0-20200831-031542
Number	2.1.0-20200831-031551
OCR	2.2.0-20200825-071359
Office 365 Excel	2.1.0-20200825-071452

Supported packages	
Package	Version
Office 365 Calendar	2.1.0-20200825-071013
Office 365 OneDrive	2.1.0-20200825-071459
PDF	2.5.0-20200831-031836
PGP	2.2.0-20200831-031838
Ping	2.1.0-20200831-031839
Printer	2.1.0-20200825-071516
Play Sound	2.1.0-20200825-071509
Prompt	2.1.0-20200824-092056
Python Script	2.1.0-20200831-031850
Recorder	2.0.8-20201009-015051
REST Web Service	3.1.0-20200824-092129
SAP	2.2.0-20200825-071614
Screen	2.1.0-20200825-071618
SNMP	2.1.0-20200825-071620
Service	3.0.0-20200821-060952
SOAP Web Service	3.1.0-20200827-210959
String	3.1.0-20200831-031943
System	3.0.0-20200831-031944
Task	2.0.1-20200907-072949
Terminal Emulator	3.3.0-20200831-031950
Trigger Email	1.1.0-20200903-114514
VBScript	2.1.0-20200831-031953
Wait	3.1.0-20200831-031955
Window	2.1.0-20200813-181240
Workload	2.1.0-20200825-071644
XML	2.1.0-20200831-031958

Changed features
<p><b>Enhanced Capture area action in OCR package</b></p> <p>The <b>Capture area</b> action now captures text from the visible area of the screen even if the target area is below the visible screen. Previously, the bot showed an error when the captured area was below the visible screen.</p> <p><i>Using Capture area action</i></p>

Changed features
<p><b>Bot Scanner update</b></p> <p>The Bot Scanner now displays error messages for bots that cannot be migrated to Enterprise A2019 in the summary report.</p> <p><a href="#">Analyze reports</a></p>
<p><b>Flow view update</b></p> <p>A line number is now displayed for each action in the <b>Flow</b> view of the Bot editor.</p>
<p><b>CSV/TXT package update</b></p> <p>The CSV/TXT package processes a space as character. For example, if your CSV or text file includes <code>January, "March, April"</code>, then the output is displayed in the following format:</p> <p>January "March (space before the double quotation mark) April"</p> <p>If the CSV or text file contains the same information but without a space between January and March (for example, <code>January, "March, April"</code>), then the output is displayed in the following format:</p> <p>January March, April</p>
<p><b>Upgrade for resilient bot deployment</b></p> <p>After you upgrade the Control Room and Bot agent to Enterprise A2019.16, scheduled and queued bots are not terminated. This is part of the resiliency improvements where the Control Room and Bot agent are set in a consistent state. As a result, the device reconnects to the Control Room if there are any network disruptions, and scheduled and queued bots are deployed.</p> <hr/> <p><b>Important:</b> During the upgrade to Enterprise A2019.16, all bots that are running will be terminated. After the upgrade, if the system is in an inconsistent state, restart the Bot agent so that the system is in a consistent state.</p> <hr/>
<p><b>Internet Explorer waits for completion before initiating Recorder action</b></p> <p>When you use the Recorder package, the bot now waits for the Internet Explorer browser to finish loading the page before executing any action. This enhances the reliability of the bot by preventing it from failing while the page is loading. For example, the Recorder does not try to search the object before the web page is fully loaded.</p> <p><a href="#">Using the Capture action</a></p>
<p><b>High availability enhancement</b></p> <p>Starting from this release, configure the required minimum three Control Room nodes in an Enterprise A2019 data center cluster for high availability deployment.</p> <p><a href="#">High availability deployment</a></p>

The following table lists the fixed features and the builds in which they were fixed (Build 6463 is the latest build, and Build 6453, and Build 6448 are previous builds). The fixes are cumulatively available in the latest build.

Fixed features		
Build number	Service Cloud case ID	Description
6463	00644915	The Bot agent now checks for additional SSL certificate from the Windows CERT_SYSTEM_STORE_LOCAL_MACHINE system stores in addition to the Java Credential Store. This allows the Bot agent to be updated automatically from an earlier release to this release.
6463	00666880, 00670899, 00672441, 00670455, 00672346	Bot files or dependencies are no longer lost when you check in or check out a bot from the private or public workspace. Previously, an error occurred while either checking in or checking out a bot, and the bot files or dependencies were lost and could not be recovered.
6463	00664020	You can now successfully run a bot that contains the <b>Capture</b> action from the Recorder package with both the <code>HTML InnerText</code> and <code>InnerHTML</code> object properties selected.
6463	--	Fixed an issue where the Universal Recorder failed to perform a click, set text, or append text action on the correct control in Google Chrome when a debug window or download bar was open.
6453	00669040, 00669164, 00668923, 669332, 00669473, 00671509, 00669178	The Automation Anywhere Elastic Search Service now restarts during the certificate retrieval process when you upgrade from Enterprise A2019.15 to Enterprise A2019.16.  However, if you encounter any issues with the Automation Anywhere Elastic Search Service during the restart, see <a href="#">Automation 360 v.16 upgrade error: Elasticsearch Service fail to start during certificate retrieval process (A-People login required)</a> .
6448	00573048	You can now preview table variables in debug mode and validate the bot logic. Previously, watch variables containing Japanese and Chinese characters did not display values in the table variable.
6448	00656475	The Bot Deploy API call now consecutively executes all the runAs users that are set in the <b>runAsUserIds</b> parameter.
6448	00569832, 00628474, 00656267	The device registration issue due to Bot agent version extraction is now fixed. The exception of "for input string null" no longer occurs.

Fixed features		
Build number	Service Cloud case ID	Description
6448	00609073	You can now successfully integrate your Control Room with your remote Git repository without any error. Previously, the Git integration failed because of a 404 error.
6448	00632444, 00626829, 00667531	When you import a main task containing subtasks using the overwrite option, the dependent subtask references are no longer deleted for other existing main tasks that use the same subtasks. As a result, the execution of other main tasks containing the same dependent subtasks does not fail.
6448	00501208, 00572346	For the <b>Create user</b> event name, the audit log now properly displays the username who created that user in the <b>Event Started By</b> column. Previously, the same column did not display any value.
6448	00616202, 00637626, 00653919, 00664039, 00664744	When the debug log is enabled in logs configuration and you use the <b>For each row in a SQL query dataset</b> option from the Loop action to iterate each row, the iteration now completes without any error. Previously, the iteration failed because of a change in the debug log configuration.
6448	00653064	After the caching service is restarted, the bot execution no longer fails. The caching client instances are reconnected and reinitialized after the restart.
6448	00577612	In a bot with dependencies, if you check out and edit a child bot in your private workspace and later check out the parent bot, you will no longer lose the changes made to the checked-out child bot. Previously, changes made to the child bot were overwritten.
6448	00623154	When a Bot Creator that does not have create folder permission tries to check in a bot to the public workspace, an appropriate error message is now recorded in the audit log, indicating the specific reason for the failure. Previously, the audit log recorded an <code>unexpected error occurred</code> message.
6448	00622977	In the <b>Edit role</b> page, file permissions are now correctly aligned in Internet Explorer. Previously, the <b>Delete from Public</b> option was displayed below the <b>Select all</b> option. As a result, the folder and permissions were not placed next to each other.

Fixed features		
Build number	Service Cloud case ID	Description
6448	00615437	You can now migrate MetaBots that contain input and output type variables with a description containing unsupported characters such as quotation marks (") and forward slash (/).
6448	00636169	The Control Room now disables a user account when the number of consecutive failed login attempts specified in the Control Room settings is reached or exceeded.
6448	00530550	A variable now returns the correct value when the regional setting of the device is set to the Brazilian metric system.
6448	00604893	A bot no longer encounters an error when the system cannot finish pre-processing the bot due to an ignite cache issue.
6448	00578277	An error is no longer encountered when the <b>Connect</b> and <b>Disconnect</b> actions of the SAP package are used in a loop and the iteration is set to more than 500 times.
6448	00635890	The Bot Scanner now scans all the bots in a repository and displays the correct count of child bots.
6448	00634238	You can now use the form builder in Internet Explorer (version 11 or later) to add more items to the <b>Checkbox</b> and <b>Radio Button</b> elements without encountering any issues.
6448	--	For the <b>Select file</b> element, you can now upload a file with a dot (.) in the filename. For example, <i>Sales.March.jpg</i> .
6448	--	Software version notification for Cloud was not always displayed in the UI. This issue is now fixed.
6448	00633793	You can run a bot when the operational parameter is used in the <b>SOAP Web Service</b> action. Previously, the bot encountered errors when the operational parameter was used in the action and the corresponding <code>wsdl</code> file did not have the <code>elementFormDefault</code> attribute.
6448	00630975	Captured images in a nested <b>If</b> action are now retained when you check in a bot to the public repository. Previously, when using any action that used an image in a nested <b>If</b> action, the image nested was missing after the check-in.

Fixed features		
Build number	Service Cloud case ID	Description
6448	00630004	When loop is used to read all <b>Unread</b> emails, the emails are now marked as <b>Read</b> only after emails are read. Previously, all unread emails were marked as read when a <b>Loop Break</b> action was used.
6448	00612913	In <b>Excel Advanced &gt; Remove blank rows</b> , when you select the <b>Specific row</b> option and set A1 as the beginning cell, an error is no longer encountered when you run the bot.
6448	00608265	In the CSV/TXT package, when you use Japanese OS ANSI (Shift-JIS) as encoding to read text file content, the Japanese Shift-JIS characters are now displayed correctly.
6448	00568718	Japanese language supported pop-up messages no longer appear truncated when multiple bots are deleted.
6448	00598023, 00611480	In the <b>DLL</b> package, <b>Run function</b> now works properly and does not display an error or show broken characters when the parameter includes Japanese characters.
6448	00638120	When you upgrade from an earlier version of Enterprise A2019 to a later version and change the <b>If</b> package version to the latest one, multiple conditions now appear in <b>If/Else If</b> after the <b>If</b> package is upgraded. Previously, some of the conditions did not show in the logic.
6448	00632228, 00649606	You can now use the <b>Send Email</b> action when the package version is different in the task and subtask. Previously, the <b>Send Email</b> action in the <b>Email</b> package had issues when the task and subtask had a different package version.
6448	00544219, 00635206	The <b>Get cell</b> action in <b>Excel Advanced</b> can now be used without any error. You can use the <b>Read</b> option to read visible data or the exact value of the cell.
6448	00646254, 00650712, 00653137, 00658122, 00666883	You can now change the package version of the <b>If</b> package. Previously, if there were multiple conditions in the <b>If</b> action, the system did not allow you to change the package version.

Fixed features		
Build number	Service Cloud case ID	Description
6448	00613453	Version 11.3 bots that used the Object Cloning command to find interface objects using coordinates or image recognition are now migrated to Enterprise A2019 with the <b>Mouse &gt; Click</b> action, <b>Simulate keystrokes</b> action, <b>OCR &gt; Capture area</b> action, or <b>Image recognition &gt; Find window in window</b> action.
6448	--	When you run migrated bots that perform mathematical operations on values containing decimals or commas, the output from Enterprise A2019 now matches the output from Version 11.3.5. Previously, an operation that resulted in an output of 0.999 in Version 11.3 resulted in an output of 0.9899999 in Enterprise A2019.
6448	00467664	Fixed an issue where the Universal Recorder entered characters in a text box incorrectly when the user configured the <b>Keystrokes</b> field using a Japanese keyboard.
6448	00630545, 00631418, 00621875	You can now assign input values from a parent bot in the <b>Task Bot &gt; Run</b> action. Previously, an issue caused input values to disappear when a bot containing more than two input values was saved.
6448	--	The Workload <b>In progress</b> activity page now displays the Workload bot name instead of the automation name.
6448	00635306	Fixed an issue where a red error screen appeared if a bot attempted to pass a file variable to another bot.
6448	00635326	You can now run bots built using Recorder package versions from earlier builds.
6448	00616261	You can now pass credential values to the main bot when you deploy it from the <b>Run bot now</b> page.
6448	00647135, 00647652, 00647665, 00647144, 00648742, 00646535, 00648883, 00648980, 00654937, 00657039, 00664049, 00663797, 00664138, 00667384	When you upgrade to the latest version of Enterprise A2019, bots in queued state now run without any issues because a new token is automatically generated when an existing session expires.
6448	00611109	Fixed an issue where the <code>System:CPUUsage</code> system variable returned an inaccurate value.

Fixed features		
Build number	Service Cloud case ID	Description
6448	00647239	In the Data Table package, when you use the <b>Merge</b> action to merge two data tables, the data is now properly merged and the merged content stores the correct data in the result data table. Previously, the <b>Merge</b> action had issues when no header data in a table was extracted, resulting in incorrect data export to CSV file.
6448	00444907, 00556374, 00582469, 00628801, 00624681, 00632668	A bot launcher error for a user session is no longer displayed when you run a bot on a Bot agent device registered to a user who is assigned developer privileges.

Security fixes	
Service Cloud case ID	Description
00552076	The vulnerabilities found in Elasticsearch in Enterprise A2019 are now addressed.
00631233	In the Database package, when you connect to the database, the username and password are no longer visible in the logs.

Known limitations
<p>When you are upgrading from an earlier version of Enterprise A2019 to the current version, the system displays the error message <i>Self Sign Certificate Failure</i>, and the installation process is rolled back if both the following conditions occur:</p> <ol style="list-style-type: none"> <li>1. The earlier version was installed on a non-default installation path instead of the default path (C:\Program Files\Automation Anywhere\Enterprise). For example, the previous version was installed on D:\Program Files\Automation Anywhere\Enterprise.</li> <li>2. You also select <b>Yes</b> to retain the current installation parameters during upgrade in the message window that appears after the <b>Welcome</b> screen when the installation wizard detects an earlier version.</li> </ol> <p><b>Workaround:</b> Select <b>No</b> so that you can choose to enter the installation parameters during the upgrade.</p> <p><i>Control Room upgrade fails with self signed certificate failure error (A-People login required)</i></p>
<p>Service Cloud case ID: 00672719, 00673048</p> <p>When you are upgrading the Control Room to the current version, the installer uses an existing or creates a new Elasticsearch data folder in the default path (C:\ProgramData\AutomationAnywhere\elasticsearch\data) if the Elasticsearch data from the earlier version is saved to a non-default path. Therefore, the earlier Elasticsearch data and audit logs will not be available after the upgrade.</p> <p><b>Workaround:</b> Before upgrading to the current version, copy the existing Elasticsearch data from the non-default path to the default path.</p>

Known limitations
When an Automation Anywhere package is manually uploaded using the Control Room interface, the <b>Vendor</b> column should show Automation Anywhere. Instead, the interface displays <i>Unspecified</i> . Automation Anywhere packages that are installed on a server as a part of an upgrade show the <b>Vendor</b> as Automation Anywhere, which is expected.
For existing device sessions, you cannot use the option to enforce the resolution set at either the device or Control Room level. The screen resolution set at these levels only work for new device sessions.
When attended and unattended Bot Runners are run concurrently, attended Bot Runner users are queued until the unattended Bot Runner session becomes available. This occurs even when the number of allowed concurrent sessions is not exceeded. For an attended Bot Runner user deployment, use a single user session to stop them from being queued.
When a user connects to a multi-user device and sets it as their default device, they are taken through the device registration wizard to enable the Google Chrome plug-in. During the registration process, users are allowed to select the device type and the concurrent sessions value. Users must ensure that they set the same value for the concurrent sessions as set by the administrator. If there is a difference in the value, other users will be impacted.
When a bot is deployed through RDP with a predefined screen resolution, the RDP resolution settings are not applied correctly during bot execution. The bot is executed with an interchanged resolution (the height and width pixels are interchanged). For example, if the resolution for bot deployment is set as 1366x768, the bot is deployed with the resolution 768x1366. <b>Workaround:</b> For information about how to resolve this issue, see <a href="#">Automation 360 v.16 - RDP based deployment does not run bot with pre-defined set screen resolution (A-People login required)</a> .
The element label or text appears distorted during bot runtime when you add it in Japanese or any other non-English language, and the <b>Font name</b> is set to <b>System default</b> .
Service Cloud case ID: 00667210  In Excel advanced, you cannot use the <b>Go to cell</b> action if the Excel sheet does not have data or if an active cell is out of the worksheet range. This issue is encountered when you use the <b>Go to cell</b> action and choose the cell option as <b>Active cell</b> with the <b>Beginning of the row, End of the row, Beginning of the column</b> or <b>End of the column</b> option. <b>Workaround:</b> Use the earlier version of the Excel advanced package 4.0.0-20200723-234413 released with Enterprise A2019.15.
HTTP authenticated proxy is not supported for On-Premises users.

## Discovery Bot

New features
<p><b>Discovery Bot installer integrated with Enterprise A2019 installer</b></p> <p>Enterprise A2019</p> <p>The Discovery Bot installer is now integrated with the Enterprise A2019 installer. No separate installation is required for Discovery Bot On-Premises users. Discovery Bot supports custom installation for Windows.</p> <p><a href="#">Prerequisites for Discovery Bot</a></p>

New features
<p><b>Create multi-role users</b></p> <p>Enterprise A2019</p> <p>Combine up to three Discovery Bot system-generated roles and two process discovery licenses to provide additional functionality for your users.</p> <p><a href="#">Create multi-role users for Discovery Bot</a></p>
<p><b>Create custom role user</b></p> <p>Enterprise A2019</p> <p>Create a unique custom role using the permissions from the Discovery Bot standard user roles (Admin, Business user, or Analyst roles).</p> <p><a href="#">Create a custom role for Discovery Bot</a></p>
<p><b>Manual aggregated view integrated with Dashboard tab</b></p> <p>Enterprise A2019</p> <p>The Manual aggregated view is now integrated with the Dashboard tab. You can now select and display recordings and views from the <b>Dashboard</b>, <b>Aggregated</b>, and <b>Comparison</b> tabs, enabling you to make a change in one tab that will persist across all tabs. This feature enables a synchronized representation of your metadata for views and recordings.</p>
<p><b>Internalization, localization, and language support for Discovery Bot</b></p> <p>Enterprise A2019</p> <p>Internalization and localization is now supported for Discovery Bot. For example, you can automate and translate the UI for your region in French, Spanish, and Italian, among other languages supported.</p> <p><a href="#">Internationalization, localization, and language support</a></p>

Fixed features	
Service Cloud case ID	Description
--	You can now sort on the recording ID. The recent recording (ID) created now displays at the beginning of the list in the Recordings table.
--	When editing the aggregated view, you can now move the endpoint upward in the path flow to change the selection of the steps. You can also move the branch endpoint lower in the path flow to include more than one step.
--	You can now select partial steps in a branch, and create and save an opportunity from the <b>Opportunities</b> tab.
--	The copy field now displays the correct view information from the view (view ID) that it is copied from.
00673381	If you are using an instance in an AWS special region, you can now view recordings for users that are successfully completed (not canceled by the user).

Known limitations
When manually editing an aggregated view, if you create a branch in the process flow where a step was deleted, the step will be missing on the left side of the branch. To add a step on the left side, you can drag the branch endpoint (small circle) down (below the next step) in the process flow to add a step back in the branch. <i>Missing step observed in aggregated view while using A2019.16 Discovery Bot (A-People login required)</i>
When an opportunity is created with 300+ steps, exporting the opportunity to Microsoft Word will fail.
The <b>Convert to Bot</b> option fails when an opportunity contains 140 or more steps.

## IQ Bot Community Edition

The IQ Bot Community Edition is available for this release and has feature parity with IQ Bot Version 11.3.4.2.

[Automation 360 IQ Bot feature comparison matrix](#)

[Automation 360 IQ Bot version compatibility](#)

---

**Important:** This new Community Edition includes a preview of IQ Bot with Auto-extraction.

---

Community Edition for IQ Bot is a special version of our product in the Cloud, available for all users who want to try RPA and IQ Bot at no cost. Users are not required to purchase a license, and there are no time limitations. However, there are some functionality constraints as follows:

- Users can create learning instances using pre-trained Invoices in English only.
- Users can create up to a maximum of 5 learning instances per user account.
- In the Learning Instance list, users can see and access only those learning instances and data created by them.
- Users can process up to a 100 pages per month for each user account.

[Using IQ Bot for intelligent document processing](#)

New features (using auto-extraction)
<p><b>Create a learning instance</b></p> <p>Use a pre-trained invoice (document type) to process and validate your documents in English (only).</p> <p><i>Create a learning instance in Automation 360 IQ Bot</i></p>
<p><b>Extract data from documents</b></p> <p>Create a bot to extract data from documents using the learning instance you created.</p> <p><i>Extract information from documents</i></p>
<p><b>Validate documents</b></p> <p>Validate failed documents manually using the validator form.</p> <p><i>Validate documents</i></p>

New features (using auto-extraction)
<p><b>Bot Insight integration</b></p> <p>View learning instance dashboard metrics that is integrated with Bot Insight.</p>
<p><b>Use the IQ Bot (Preview) package</b></p> <p>Use the IQ Bot (Preview) package to process and validate documents using Enterprise A2019.</p> <p><a href="#">IQ Bot (Preview) package</a></p>

Changed features
<p>For the Custom Logic feature, the identified list of Python libraries now includes an additional set of safe libraries for IQ Bot Community Edition. Go to Automation Anywhere support for a list of the safe libraries you can use.</p> <p><a href="#">List of Pandas Libraries which are supported and not supported on Automation 360 IQ Bot (A-People login required)</a></p>

Fixed features (using Auto-extraction)				
<table border="1"> <thead> <tr> <th>Service Cloud case ID</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>00628958</td> <td>The Task Bot now successfully processes all documents without displaying any error messages.</td> </tr> </tbody> </table>	Service Cloud case ID	Description	00628958	The Task Bot now successfully processes all documents without displaying any error messages.
Service Cloud case ID	Description			
00628958	The Task Bot now successfully processes all documents without displaying any error messages.			

Known limitations (using Auto-extraction)
<p>PDF documents with raster format or JBIG2 encoding are not supported.</p> <p><b>Workaround:</b> Convert such documents to one of the supported formats before processing your documents for data extraction.</p> <hr/> <p><b>Note:</b> Digital PDFs, JPEG, JPG, and PNG are supported formats.</p> <hr/>
<p>Rotated documents are not supported.</p> <p><b>Workaround:</b> Pre-process such documents to correct their orientation before data extraction.</p>
<p>Only a predefined set of form and table fields are supported. The table header does not support multiple fields in a single column.</p>
<p>During the validation process, if a user deletes all rows from a table, the user is unable to add a new row.</p> <p><b>Workaround:</b> Perform these steps:</p> <ol style="list-style-type: none"> <li>1. Cancel the validation user form and open the document again.</li> <li>2. Create a new row before deleting the unwanted rows.</li> </ol>

**Known limitations (using Auto-extraction)**

Documents that are pending review from Enterprise A2019.15 cannot be validated in Enterprise A2019.16 using the **Review documents** option.

**Workaround:** Create a Task Bot using the IQ Bot **Validation** action in the Enterprise A2019.15 package, and validate the review pending documents.

## IQ Bot

**New features****Updates to IQ Bot Pre-processor package**

On-Premises and Cloud

You can now perform the following tasks using the new actions in the IQ Bot package:

- Link or combine two images using **Concatenate image**
- Adjust the size of the selected image file using **Edit image**
- Enhance the image resolution and other aspects using **Enhance image**
- Change the image orientation such as angle using **Orient image**

[IQ Bot Pre-processor package](#)

**IQ Bot [Local Device] package enhancements**

The IQ Bot [Local Device] package now enables you to add custom logic (Python scripts) in the Designer to extend text extraction and validation capabilities.

[Add custom logic in IQ Bot to improve extraction](#)

**Fixed features**

Service Cloud case ID	Description
00590165	You can now train the selected document because error messages are no longer displayed when you click <b>Learning instances</b> > <b>See extractions</b> for a group.
--	If you remove a bot ( <b>Delete a bot</b> ) associated with a document from the staging environment, you must create a group before uploading this document to the production environment. After deleting the bot from the staging environment, you can now create or edit the group when you upload the same document to the production environment.
00601840	You can now view a public bot without any errors when you click <b>BOTS</b> > <b>My bots</b> > <b>PUBLIC</b> in Enterprise A2019.
00672482	You can now validate documents with a large number of fields (more than 100) and navigate between multiple documents without any issues on the <a href="#">Validator</a> .
00648013, 00670191	You can now migrate, export, import, or download IQ Bot learning instance backup (.iqba) files of up to 1.4 GB. The previous limit was 600 MB.

**Known limitations**

Migration of learning instances does not get completed if the IQBA file size is more than 2 GB.

**Workaround:** *Migration of learning instance is not getting completed if the IQBA is more than 2GB (A-People login required)*

In the IQ Bot Designer, sometimes while training documents when the user clicks **See extraction results**, an error message appears and the user cannot proceed with the task.

## Bot Insight

**New features****Power BI connector available as part of Microsoft Power BI desktop**

Enterprise A2019 and Community Edition

The Automation Anywhere connector for Bot Insight is now certified and officially a part of the Microsoft Power BI Desktop August release.

[Data connector for Power BI](#)

**Business analytics support for attended Bot Runners**

Enterprise A2019 and Community Edition

Business analytics data is now logged when bots are run with attended Bot Runners licenses. Also, a new attribute **User Name** is available in the **Business Dashboard** in **Transaction Data**. This attribute shows the user who is running the bot.

**Changed features****Convert bot duration metric to percentage**

In the **Device** dashboard, when you select the metric as **Bot Duration**, you have an additional option to convert the bot duration to percentage. This option appears only if a selected group or subgroup is of date type variable.

[Operations dashboard](#)

**Known limitations**

Due to security reasons, you cannot access the following Bot Insight APIs and a 403 forbidden error is displayed.

```
GET/v2/botinsight/data/api/gettasklogdata
GET/v2/botinsight/data/api/gettaskvariableprofile
DELETE/data/api/deletetasklogdata
GET/data/api/getbotrundata
GET/data/api/getaudittraildata
```

## Automation Anywhere Robotic Interface (AARI)

**Important:** This AARI version is available for all users starting from Enterprise A2019.16.

New features
<p><b>Assign tasks</b></p> <p>Enterprise A2019</p> <p>AARI managers and users can now assign tasks. Managers can assign and reassign tasks to any users from teams with an assigned process. Users can assign tasks to other users of the same team.</p> <p><a href="#">Assign or unassign a task</a></p>
<p><b>Filter and search tasks</b></p> <p>Enterprise A2019</p> <p>AARI users can now perform the following tasks:</p> <ul style="list-style-type: none"> <li>• Filter, sort, and search tasks for quick results</li> <li>• Search task names using <b>Search Title</b></li> <li>• Sort by completed, pending, and unassigned tasks using the <b>Filter</b> option</li> <li>• Configure results based on assignee or title using <b>Advanced filter</b></li> <li>• Click a column to sort by ascending or descending orders</li> </ul> <p><a href="#">Filter and search for a task.</a></p>
<p><b>Summarized information of tasks</b></p> <p>Enterprise A2019</p> <p>The <b>Tasks</b> tab in the main page shows statistical insight for the numbers of completed, pending, and unassigned tasks.</p>
<p><b>Process package</b></p> <p>Enterprise A2019</p> <p>The <b>Process</b> package enables users to create a request inside a specified process from a bot.</p> <p><a href="#">Process package</a></p>
<p><b>Preview bot</b></p> <p>Enterprise A2019</p> <p><b>Human Tasks</b> and <b>Bot Tasks</b> now include the <b>Preview bot</b> option, which enables users to quickly preview relevant bot or forms information.</p>
<p><b>Process editor metadata</b></p> <p>Enterprise A2019</p> <p><b>Human Tasks</b> and <b>Bot Tasks</b> now accept username and email metadata. Users can enter the name and email values to their process workflow such as <code>\$Task.assignedTo{username}\$</code> and <code>\$Task.assignedTo{email}\$</code>.</p>

New features
<p><b>Enhancements to roles</b></p> <p>Enterprise A2019</p> <p>The AARI admin can now assign a process to a team they created and become the manager assigned to that process. The admin can also assign a process to a team they did not create and the manager of that team is assigned to the process.</p>
<p><b>Administration permission</b></p> <p>Enterprise A2019</p> <p>The AARI admin and manager are now assigned a new <b>Administration</b> permission by default called <b>View Users and Roles basic information</b>. The admin can now view the process management page to assign or unassign managers.</p>

Changed features
<p><b>Process management page</b></p> <p>The process management page in AARI on the web is now removed for managers.</p>
<p><b>Password field in request view</b></p> <p>The <b>Password</b> element is now removed when viewed in the request tab.</p>

Fixed features	
Service Cloud case ID	Description
--	A team name is no longer limited to 20 characters.
--	When you open many request tabs, the navigation bar now functions properly and allows you to navigate to your tabs by using the arrow icon.
--	When you view tasks in the request view, the request and task now show the correct status.
--	The manager can now be removed in the process management page.
--	The bot status in the request view is now represented as a progress bar.
--	The <b>Element name</b> field in the process editor now shows the correct error message when the field contains spaces.
--	When you select the <b>Make field uneditable</b> option for the <b>Checkbox, Date, Dropdown, Number, Password, Radio Button, Text Area, and Text Box</b> elements, the values can no longer be edited.
--	The team management page now shows the <b>Owner</b> column.
--	When number values are entered in a number field, such as a phone number box, the values are now accepted.
--	In the device pool configuration page, the Bot Runner users check box is now selected.

Fixed features	
Service Cloud case ID	Description
--	The <b>Checkbox</b> and <b>Radio Button</b> elements now support horizontal format.
--	The <b>Document</b> element can now access the <b>Open the doc in browser</b> link.
--	The <b>Number</b> element values are no longer limited to 8 characters and can now be rendered properly when the values contain trailing zeroes, commas, and decimals.
--	When you select the <b>Insert a variable</b> option in the process editor, the <b>Variable</b> field now shows specific variable names.
--	The redo functions now works properly in the process editor.
--	The <b>Text Box</b> element now accepts number-only inputs.
--	The timestamp of the closing step now shows the timestamp of the last step in request view.
--	When you access a public process, the existing variable in the field can no longer be changed.
--	The <b>Masked data</b> option is now fully supported for all elements.
--	When you edit a checked-out process that contains conditional steps with variables, you can now edit and save these conditional steps.
--	When a process is configured with two forms that contain a <b>Dropdown</b> element, the process creation shares the <b>Dropdown</b> element data between the forms. The <b>Dropdown</b> element in the second form now receives data from the first form.
--	The manager can now access their team without encountering any errors.
--	You can now update values in a prepopulated text field in request view.
--	When you create a request and encounter a preprocessing error, the request creation ends and the request view now shows the failed status.
--	The <b>Go To</b> option in the process editor now shows the <b>Human Task</b> or <b>Bot Task</b> name.
--	Users with the AARI manager and user roles are now automatically redirected to the web interface when they access the Control Room URL.

Known limitations
When you provide your <b>Bot Task</b> and <b>Human Task</b> the same element name, an error occurs for the <b>Go to</b> element, but the process editor does not prompt an error. <b>Workaround:</b> Create unique element names for your <b>Bot Task</b> and <b>Human Task</b> .
When you create a form that contains a <b>Document</b> element and access your <b>Human Task</b> in the process editor, you cannot assign your variable because the <b>Add element</b> option is not available.
The <b>Display message</b> field in the <b>If/Else pair</b> action does not function correctly when displaying a message in request view.
The titles ( <b>Title</b> field) of completed requests in AARI on the web are replaced by endpoint display names.
When you create a form that contains a <b>Number</b> field set to a 10-character limit and you enter 1234567890 in the number field in request view, the number values are not accepted.
When you create a process with a form that contains a <b>Date</b> element, the <b>Condition</b> option in the <b>If/Else pair</b> action does not allow you to enter a variable.

## Enterprise A2019.15 Release Notes

*Release date: 14 August 2020*

Review the new features, supported packages, changed features, fixed features, security fixes, and known limitations in the Enterprise A2019.15 (Build 5933) release. IQ Bot and Discovery Bot are on Build 5931.

- [Enterprise A2019](#)
- [Discovery Bot](#)
- [IQ Bot](#)
- [Bot Insight](#)
- [Automation Anywhere Robotic Interface](#)

### Enterprise A2019

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Introducing Discovery Bot and Automation Anywhere Robotic Interface</b></p> <p>Enterprise A2019</p> <p><a href="#">Discovery Bot</a>   <a href="#">Automation Anywhere Robotic Interface</a></p>
<p><b>Migration from 11.x and 10.x to Enterprise A2019 (currently available only to those in the Migration Early Adopter Program)</b></p> <p>Enterprise A2019</p> <p>Migration to Enterprise A2019 is currently only available to select customers through our Migration Early Adopter Program. If you are interested in learning more about this program or a timeline for when migration will be available to all customers, contact your Automation Anywhere representative.</p>

New features
<p><b>Perform an action on multiple objects of the same type</b></p> <p>Enterprise A2019</p> <p>The variable anchor in AISense Recorder enables you to perform an action on multiple objects of the same type.</p> <p><a href="#">Use variable anchor</a></p>
<p><b>Run 11.x bots from Enterprise A2019</b></p> <p>Enterprise A2019</p> <p>The <b>V11 TaskBot package</b> enables you to run 11.x bots from Enterprise A2019 in the 11.x Control Room.</p> <p><a href="#">V11 Task Bot package</a></p>
<p><b>Enhancements to the Interactive forms</b></p> <p>Enterprise A2019</p> <p>Interactive forms include the following updates:</p> <ul style="list-style-type: none"> <li>• You can include the <b>Dynamic</b> element of the selected form in the <b>Change label</b> action.</li> <li>• In the <b>Dynamic area</b> actions: <ul style="list-style-type: none"> <li>• You can add a maximum of four elements for the <b>Add row in Dynamic area</b> action.</li> <li>• In the <b>Add element</b> screen, use additional options from the <b>Type</b> drop-down menu such as Checkbox, Dropdown, File, Snapshot, RadioButton, Text Area, and TextBox.</li> </ul> </li> </ul> <p><a href="#">Interactive forms package</a></p>
<p><b>Support for interactions with Oracle EBS tables</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the Universal Recorder or the <b>Recorder &gt; Capture</b> action to read data from an Oracle EBS table. The following actions are now supported:</p> <ul style="list-style-type: none"> <li>• Get Total Row</li> <li>• Get Total Column</li> <li>• Get Cell text by Index</li> <li>• Get Cell index by text</li> </ul>
<p><b>Expanded data type support in DLL package</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The DLL package now accepts dictionary and list variables as input parameters or to hold action output.</p> <p><a href="#">Using the Run function (Legacy) action</a></p>

New features
<p><b>Create device pools using API</b></p> <p>Enterprise A2019</p> <p>You can now create a device pool and add unattended Bot Runners to the device pool using an API. This API uses <b>deviceIds</b>, <b>automationScheme</b>, <b>ownerIds</b>, and <b>consumerIds</b> as parameters to create a device pool.</p> <p><a href="#">Create device pool API</a></p>

Supported packages	
Package	Version
Node Manager	12.1.6000
Application	2.0.0-20200721-221935
App Integration	1.0.0-20200721-221933
Analyze	2.2.3-20200624-011702
Active Directory	2.0.1-20200721-221930
Boolean	2.0.0-20200721-221936
Bot Migration	2.4.0-20200604-174031
Browser	2.0.0-20200721-221938
Clipboard	2.0.0-20200721-221947
Comment	2.0.0-20200721-221948
CSV/TXT	2.0.0-20200726-052504
Database	2.0.0-20200723-022707
Data Table	2.0.0-20200721-222456
Datetime	3.0.1-20200721-222000
Delay	2.1.0-20200721-221959
Dictionary	2.0.0-20200624-041629
Run DLL	2.0.0-20200721-222437
Email	2.0.0-20200721-222003
Error handler	2.0.0-20200721-222009
Excel basic	2.0.0-20200721-222339
Excel advanced	4.0.0-20200723-234413
File	2.1.0-20200624-041638
File & folders	2.1.0-20200721-222011
Folder	2.1.0-20200721-222013
FTP / SFTP	2.0.0-20200721-222017
IF/ELSE	2.0.0-20200721-222021

Supported packages	
Package	Version
Image Recognition	2.0.0-20200721-222024
Interactive forms	2.15.0-20200729-084624
IQ Bot	2.0.0-20200415-125005
JavaScript	2.0.0-20200721-222202
Simulate keystrokes	2.1.0-20200721-222204
Legacy Automation	2.0.0-20200721-222207 1.0.0-20200515-133334
List	2.0.0-20200721-222211
Log To File	2.1.0-20200721-222212
Loop	2.0.0-20200721-222213
Message Box	2.0.0-20200721-222213
Migration	2.4.0-20200728-033126
Mouse	2.0.0-20200721-222218
Number	2.0.0-20200721-222224
OCR	2.1.0-20200721-222225s
Office 365 Excel	2.0.0-20200721-222319
Office 365 Calendar	2.0.0-20200721-221944
Office 365 OneDrive	2.0.0-20200721-222326
PDF	2.4.0-20200721-222331
PGP	2.1.0-20200721-222333
Ping	2.0.0-20200721-222334
Printer	2.0.0-20200721-222342
Play Sound	2.0.0-20200721-222335
Prompt	2.0.0-20200721-222344
Python Script	2.0.0-20200721-222345
Recorder	2.0.6-20200626-193519
REST Web Service	2.0.0-20200721-222436
SAP	2.1.0-20200723-234637
Screen	2.0.0-20200721-222442
SNMP	2.0.0-20200721-222445
SOAP Web Service	3.0.0-20200721-222448
String	3.0.0-20200721-222454
System	2.0.0-20200721-222454

Supported packages	
Package	Version
Task	2.0.0-20200624-103759
Terminal Emulator	3.2.0-20200721-222500
Trigger Email	1.1.0-20200721-222511
VBScript	2.0.0-20200721-222503
Wait	3.0.0-20200721-222505
Window	2.0.0-20200721-222507
Workload	2.0.1-20200721-222508
XML	2.0.0-20200721-222509

Changed features
<p><b>User validation for change in authentication type</b> (Service Cloud case ID: 00602788)</p> <p>Enterprise A2019</p> <p>The username is now validated when an admin user updates the Control Room authentication configuration from <b>Database</b> to <b>SAML (Administration &gt; Settings &gt; User Authentication)</b>. An error message appears if the username already exists.</p> <p><a href="#">Set up SAML authentication</a></p>
<p><b>The Before and After fields in the String &gt; Extract action are now optional</b> (Service Cloud case ID: 00617151)</p> <p>Enterprise A2019 and Community Edition</p> <p>Users can now build and run bots that do not have a value in the <b>Before</b> or <b>After</b> fields. This ensures migrated bots that contain the <b>String &gt; Extract</b> action can run without disruption.</p>
<p><b>Improved debugging for Image Recognition actions</b></p> <p>Enterprise A2019 and Community Edition</p> <p>When a bot fails while running one of the Image Recognition actions, the captured source and target images are stored in the log folder. Users can review the images to identify issues such as the application image not captured correctly or low quality of the image due to differences in the Bot Creator and Bot Runner devices.</p> <p><a href="#">Image Recognition package</a></p>

Fixed features	
Service Cloud case ID	Description
00609293	The AATaskName system variable now uses a backslash (\) to support the migration of 11.x bots that use this variable to Enterprise A2019.
00600367, 00620149	When calling REST APIs for using the REST Web Service command, the API now returns the correct status and the response code.

Fixed features	
Service Cloud case ID	Description
--	When Work Items are processed for automation in the Bot agent, you can now view the workload automation name in the <b>Workload &gt; Queue &gt; View Activity in progress</b> and <b>Run bot with queue &gt; View</b> pages, even when the workload automation ID and schedule automation ID are the same in the Control Room database.
00606636	The migration of 11.3.x bots that read a date from a file to an Enterprise A2019 variable now results in the correct date format: dd/mm/yyyy. Previously, a series of numbers were displayed in Enterprise A2019.
00576004	Fixed an issue where some emails were retrieved with HTML tags, even when the user selected the <b>Plain text</b> option.
00585830	Fixed an issue where the <b>Loop &gt; For each meeting in calendar</b> iterator only returned details for the first meeting of the day. Now, the output variable refreshes after each iteration and returns details for each meeting.
00505228, 00576757	When the browser language is set to Japanese, error messages from the <b>Control Room &gt; Administration &gt; Settings &gt; Email</b> page are now displayed correctly. The distorted Japanese character issue is now fixed.
--	You can now check in any forms or bots in the <b>Public</b> folder that were created using any of the earlier versions of Enterprise A2019.
--	You can now use the <b>Get</b> action without any errors for an empty dynamic element of a form during bot runtime.
00575400, 00597633	You can now use <b>Email trigger</b> to start a bot even when Microsoft Office is set to a non-English language.
--	If you are using the <b>Snapshot</b> element, the form is no longer minimized even if you set an invalid file path to save the snapshot during bot runtime.
00566225	If you add a form with a Japanese name, error messages are not displayed during bot runtime.
00571773	If you have added element label or text in Japanese and set <b>Font name &gt; System default</b> , the form elements are now displayed without any distortion during bot runtime.  <a href="#">Create a form</a>
00620911	For the <b>Select file</b> element in a form, the file path is now displayed correctly when you select a file with a Japanese name during bot runtime.
--	If a form has a <b>Dynamic</b> field, any errors within any of the available elements are now displayed immediately during bot runtime.
--	An error is now displayed if you use the <b>Tab</b> key to navigate out of the <b>Dropdown</b> element in a form during bot runtime.

Fixed features	
Service Cloud case ID	Description
00616251	If a Bot Runner (attended or unattended) user is running a bot and an event trigger that is associated with this user starts, the event trigger is now queued and deployed after the current bot has completed.
00557617	The Simulate keystrokes action now supports ASCII characters when the device language is set to Russian.
--	Installing cloud-based license files is now supported on Control Room deployments using Linux CentOS 7.
00615038	All packages and actions now work with the "Portuguese (Brazil)" browser language. Previously, some packages and actions caused an unresponsive Control Room when "Portuguese (Brazil)" was selected as the browser language.
--	You can now reset the password successfully when the service credential expires or is disabled. Previously, users intermittently experienced issues while resetting the password.
--	The default logging for Bot agent is no longer in debug mode. Previously, debug mode was the default logging, which caused an increase in the number of logs and resulted in high storage space and decreased system performance.
00588077	If you create a copy or edit the content of an existing CSV file, the modified content that is uploaded in the Control Room will now display correctly and will not cause any run-time error when the bot is executed.
00541524,00531540	You can now run bots even when the path of the bot location is more than 255 characters. Previously, the bot failed with an error.
00615106	The Bot Scanner now analyzes large bots within a few minutes.
00610366	Keyboard shortcuts such as Ctrl+C, Ctrl+V, and Ctrl+X work as expected on Internet Explorer.
00577850, 00608065, 00597132, 00596397, 00619463	The Control Room now does not become unresponsive after a period of inactivity.
00608824	An error is no longer encountered when a bot opens the Excel application after it is forcefully terminated.
00542144	The wait option in various packages now works as expected for applications based on HTML technology. Previously, the wait option used to wait for a period in multiples of 15 seconds based on the value provided. For example, if the wait value was in the range of 1-14, the system waited for 15 seconds.
00508478, 00504802, 00569822	An error is no longer encountered when a bot is running and an application window is closed when the bot is performing the find window operation.
00494857	A user that does not have the <b>Register device</b> permission can no longer register a device by creating a custom Bot Creator role.

Fixed features	
Service Cloud case ID	Description
00501619, 00614130, 00620198	An error is no longer encountered when a user deletes a device after upgrading to a later version of Enterprise A2019.
00616786	Fixed an issue where periodic scheduled bot deployments failed with the following error message (even though the credentials provided by the bot is correct):  Either your username or your password is incorrect. This might be due to a misspelling, your Caps Lock might be on, the password might have expired, or the domain might be required. To continue, retype your username and password.
00494893	Fixed an issue where the <b>Error handling &gt; Catch</b> action was not handling a runtime error with the record variable. Previously, the <b>Catch</b> action did not capture an <code>index out of bounds</code> error when the record variable was entered in a <b>Message box</b> action with the index specified by name.
--	The Get Property datetime format within the Active Directory package now displays the information using the system datetime format.
--	When you edit a bot using a previous package version (for example, Enterprise A2019.13 version) and the Desktop session automatically starts, if you exit the Bot editor while the Desktop session is trying to launch, the current package version will now be displayed when you open a new Bot editor instance. Previously, the previous package version (for example, Enterprise A2019.13 version) was displayed.
00563346	Credentials with non-ASCII characters are now allowed to be stored in the <b>Credential Vault</b> in the Control Room. Therefore, when you run TaskBots to open files that are protected using passwords containing non-ASCII characters, the application does not respond with an HTTP 500 error.
00525552, 00470841	The Run task no longer fails when the child bot name contains allowed special characters. Previously, when the child bot name contained allowed special characters, the run task displayed an error message.
00501212	Fixed an issue in the SMTP settings where the Control Room was sending notification emails for all of the conditions, including the disabled conditions.
00607005	A security scan of Enterprise A2019 no longer reports the Recorder package as a malicious software. Previously, the security scan reported it as a malicious software because the <code>check.exe</code> file was missing the root identification certificate.
00564129	On an operating system configured for Japanese, the Roles pages in the Control Room now shows English text as expected when you select English in the Control Room language selection.

Fixed features	
Service Cloud case ID	Description
00629523	When you upgrade from an earlier version of Enterprise A2019 to a later version and change the If package version to the latest one, conditions combined with the <b>AND</b> or <b>OR</b> condition now appear in the logic. Previously, except for the first condition, the rest of the conditions with the <b>AND</b> or <b>OR</b> condition were not shown.
00631477	When Work Items from multiple queues are processed for Workload automation from one device pool with the round-robin method for a time slice of 5 minutes, the Workload automation does not run in a loop and thereby causing an increased CPU usage.
00633829	As system admin permissions for Workload automation are verified by the application when you run a bot with queue from a single device pool to process multiple Work Items concurrently, CPU usage does not increase drastically.
00615086	Fixed an issue where the Java Application Launcher continued to run after a user stopped the Bot Scanner, which caused device performance issues for some users.
--	Variables of the List type are now available for migration from 10.x and 11.x to Enterprise A2019.
00607949	Disabled packages will not be enabled when you upgrade from an earlier version of Enterprise A2019 to a later version. Previously, packages that were disabled were enabled after an upgrade.
--	You can now debug a bot with watch variables that contain Japanese characters. Previously, watch variables containing Japanese characters did not output a value.
00623186, 00624876, 00624060, 00627123, 00629873, 00639523, 00630880, 00634577, 00636166	The correct status of a deployed bot now appears instead of <i>Device yet to be determined</i> in the Control Room <b>Activity</b> page, and the user is allowed to delete the device that has completed running a bot. The following message no longer appears: <i>Device is part of active deployment.</i>
00573461	Fixed an issue where a bot was failing in preprocessing mode if the user had inserted and then disabled the <b>Error Handler &gt; Catch</b> action without also disabling the <b>Finally</b> or <b>Catch</b> actions.
00629046	In the Database package, when you use Microsoft Excel as a database, the bot launcher now executes properly. Previously, the bot launcher stopped working when reading data from an Excel sheet that had some empty rows.

Security fixes	
Service Cloud case ID	Description
00491697	The Transport Layer Security (TLS) protocol using CBC mode of encryption for configuring the network security of the Control Room is now secured from man-in-the-middle or crystallographic timing attack.

Known limitations
When you add a form with the <b>Dynamic</b> element to a bot, click <b>Add element</b> , select <b>Dropdown</b> or <b>Radio group</b> as the <b>Type</b> , and leave the <b>Default value/ Default path</b> field blank, the elements appear as labels during bot runtime.
You can move a form around by dragging the title bar during bot runtime.
When you copy and paste the filepath for the <b>Select file</b> element of a form during bot runtime, invalid characters are displayed.
When the <b>Set focus</b> action is assigned to a disabled form element, an error icon is displayed when the focus is lost during bot runtime.
When you enable any of the disabled fields during bot runtime, error icons are not displayed.
Error messages during bot runtime are not displayed in the language selected in the Control Room.
If email trigger is used to start a bot, the status of the most recent email that you have viewed is changed to <b>Unread</b> every time any bot is triggered based on the trigger interval set in the <b>Check every</b> drop-down menu.
In an Control Room configured for Active Directory users, the following message appears after the first admin user is created: <code>Do you want to leave this page?</code> <b>Workaround:</b> Click <b>Stay on page</b> so that you can go to the Control Room login page.
If the device is already registered by a user other than the Bot Creator and the Bot Creator has the <b>Register device</b> permission, then when you run a bot from the Bot editor window, the deployment fails at the <code>Connecting your computer to Enterprise Control Room</code> step.
The migration process does not migrate manual dependency files added in the 11.x Control Room using the API. Bots associated with these dependencies will be migrated successfully but will fail during execution because the system cannot find these dynamically added dependency files at runtime in Enterprise A2019.
When a bot execution is in progress and the Control Room server refreshes, the progress status of the <b>In-Progress</b> activity will not be displayed even though the bot execution continues without interruption.

## Discovery Bot

### Introduction

Discovery Bot enables process automation by capturing document processes, identifying automation opportunities from business processes, and prioritizing opportunities based on ROI. Users can convert these opportunities into automated processes.

*[Process Discovery using Discovery Bot](#)*

Known limitations
<p>Discovery Bot is not supported in high availability (HA) mode. When two Control Room instances are used in a cluster configuration, the recording artifacts are split between the two Control Room instances and the recording might fail to process.</p>
<p><b>Workaround:</b> To enable Discovery Bot in HA mode, you must update the <code>processdiscovery.properties</code> file to point to the repository path specified in the Control Room:</p> <ol style="list-style-type: none"> <li>1. From the Control Room, go to <b>Administration &gt; Settings &gt; General</b>.</li> <li>2. Select the <b>Control Room Database and Software</b> tab.</li> <li>3. Scroll to the <b>Control Room Repository</b> section.</li> <li>4. Copy the path specified in the <b>Repository path</b> field.</li> <li>5. Go to <code>C:\Program Files\Automation Anywhere\Enterprise\config</code>.</li> <li>6. Open the <code>processdiscovery.properties</code> file.</li> <li>7. In the <code>processdiscovery.data.staging</code> path, paste the repository path in the <code>&lt;yournetworkshareddrive&gt;</code> here: <code>\\&lt;yournetworkshareddrive&gt;\Processdiscovery\staging\data</code></li> <li>8. Restart the Discovery Bot service.</li> </ol>
<p>When HTTP proxy is installed in a cloud environment, you can use the Discovery Bot recorder to record processes.</p>
<p>Custom role setup for Discovery Bot is currently not supported.</p>
<p>The Discovery Bot recorder continues to record your steps even after you have logged out of the Control Room.</p>
<p><b>Recommendation:</b> Manually stop the recorder to end the recording session.</p>
<p>The Discovery Bot recorder displays an internal error message when accessing Google Apps. Pause the recording and then resume the recording again to recapture the steps.</p>
<p>The recent recording (ID) created is displayed at the end of the list in the <b>Recordings</b> table. You cannot sort on the recording ID at this time.</p>
<p>The recording count for a process is incremented by one even if a user stops or cancels a recording session. The incremented number is displayed in the <b>Recordings</b> section in the tile for a process.</p>
<p>By default, you cannot move the endpoint in an upward direction in the path flow to change the selection of the steps. You can move the branch endpoint lower in the path flow to include more than one step.</p>
<p>You must add at least one step to a branch for you to select the branch and create an opportunity.</p>
<p>You must select all steps in a branch to create an opportunity. Selecting partial steps in a branch will result in branch being dropped in the opportunity that is displayed from the <b>Opportunities</b> tab.</p>
<p>Currently, the <b>copy of</b> field does not display the correct view information from the view (view ID) that it is copied from.</p>

Known limitations
If the Control Room is not installed in the C:\ drive ( C:\Program Files\Automation \Enterprise), the Discovery Bot installer fails to install correctly. If the Control Room is not installed in the C:\ drive, then perform the instructions provided in this article: <a href="#">A2019.15 Discovery Bot installation issue with non-OS drive (A-People login required)</a> .
The <b>Export to Word</b> option supports a maximum of 500 steps.
The <b>Convert to Bot</b> option supports a maximum of 500 steps.

## IQ Bot

Review the compatibility of the IQ Bot On-Premises version with the corresponding Control Room On-Premises version.

[Automation 360 IQ Bot version compatibility](#)

For feature information about IQ Bot, see [Automation 360 IQ Bot feature comparison matrix](#).

The IQ Bot Cloud version provides users with automatic provisioning for up to three environments such as Development, Test, and Production.

---

**Note:** IQ Bot Build 5931 is compatible with Enterprise A2019 Build 5933.

---

New features
<p><b>New IQ Bot Pre-processor package</b></p> <p>On-Premises and Cloud</p> <p>The following new actions are available as part of the IQ Bot package:</p> <ul style="list-style-type: none"> <li>• Convert image to PDF</li> <li>• Get barcodes</li> <li>• Get document info</li> <li>• Get page content</li> </ul> <p><a href="#">IQ Bot Pre-processor package</a></p>
<p><b>Search by filename in Validator</b></p> <p>On-Premises and Cloud (Service Cloud case ID: 00372981)</p> <p>Use the <b>Search by filename</b> field in the <b>Validator</b> screen to search a document in IQ Bot.</p> <p><a href="#">IQ bot Validator enhancements</a></p>

New features
<p><b>IQ Bot [Local Device] package</b> (currently available on request only)</p> <p>On-Premises and Cloud</p> <hr/> <p><b>Important:</b> Contact your Automation Anywhere representative to request the On-Premises package. For Cloud, it is available as a pre-installed package.</p> <hr/> <p>Use the <b>IQ Bot [Local Device] &gt; Process documents</b> action to process documents using TaskBots created in the Control Room. You can scale by processing documents on multiple devices simultaneously without setting up a separate IQ Bot cluster. You can set this up using workload management (WLM) in the Control Room.</p> <p><i>Workload management</i></p> <p>The validation is done using the current IQ Bot Validator and usage metrics on the dashboards, which is available with the installed IQ Bot server.</p> <hr/> <p><b>Note:</b> You can create validators using interactive forms if they do not want to send data to the IQ Bot server.</p> <hr/> <p><i>IQ Bot [Local Device] package</i></p>
<p><b>IQ Bot Classifier package</b> (currently available on request only)</p> <p>On-Premises and Cloud</p> <p>The IQ Bot Classifier package enables you to group documents into appropriate learning instances for content extraction.</p> <p>This package is not available as part of the standard IQ Bot installation.</p> <hr/> <p><b>Important:</b> Contact your Automation Anywhere representative to request the package.</p> <hr/> <p><i>IQ Bot Classifier package</i></p>
<p><b>Migrate learning instances using Migration Utility</b></p> <p>On-Premises and Cloud</p> <p>Use the Migration Utility feature to migrate learning instances from one environment to another. Additionally, you can back up, restore, download, delete, and upload learning instances.</p> <p><i>Migrate learning instances</i></p>
<p><b>Control creation of groups</b></p> <p>On-Premises and Cloud</p> <p>Use the <b>New groups creation setting</b> section in the <b>Learning Instance &gt; Edit</b> page to limit creating groups when uploading training documents to IQ Bot. Use the <b>Threshold to create new groups</b> value and <b>Never create new groups</b> check box to define the parameters.</p> <p><i>Bots</i></p>

Changed features
<p>For the Custom Logic feature, the identified list of Python libraries now includes an additional set of trusted libraries for IQ Bot On-Premises and Cloud. Go to Automation Anywhere support for a list of the safe libraries you can use.</p> <p><i>List of Pandas Libraries which are supported and not supported on Automation 360 IQ Bot (A-People login required)</i></p>

Fixed features	
Service Cloud case ID	Description
00376179	The Automation Anywhere Cognitive Project is now created without any errors even when you use the IQ Bot batch files to install or uninstall IQ Bot.
00560185	The <b>Download Document</b> in IQ Bot now runs without any errors, irrespective of the language in which the learning instances are saved.
00574815	You can now use the Google Vision API engine to classify the selected PDF files without creating any unclassified groups.
--	Documents are now classified correctly by the Google Vision API, irrespective of the display limitations set. Previously, an incorrect resolution limitation created unclassified documents.
--	You can now use Internet Explorer to save a document or mark it as invalid in the learning instances validator screen, without any error messages.
00620237, 00623175	After logging in to the Control Room as an IQ Bot administrator, the <b>IQ Bot</b> tab is no longer displayed in the navigation bar.
--	The <code>Output.csv</code> file generated for a validated document and validated data are now displayed without any error messages.
00605607	When you click <b>Save current document</b> in the validator screen, the document is saved without any errors and the corresponding <code>.csv</code> file is created in the output folder.

Known limitations
<p>IQ Bot On-Premises and Cloud</p> <p>When you click the <b>Save and go to next group</b> option, the available groups or the learning instances are sometimes not displayed.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>A validation error message along with the corrected field is displayed in the output (<code>.csv</code>) file for documents validated using ValidatorURL.</p>

Known limitations
<p>IQ Bot Cloud (Service Cloud Case ID: 00647700, 00657619, 00656643)</p> <p>The output (.CSV) files are not downloaded even when you click <b>Download all documents</b> button, and an error message is displayed.</p> <p>Contact Automation Anywhere support for more information.</p>

## Bot Insight

New features
<p><b>Date Interval option</b></p> <p>Enterprise A2019</p> <p>When you create new widgets that support date fields for a group or subgroup, the <b>Date Interval</b> option is enabled with the default option set to <b>Month</b>.</p> <p><a href="#">Configuring a Line Bar Chart query</a></p>
<p><b>New clustered line bar chart widget</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Clustered Line Bar Chart widget enables you to view and analyze information about your metrics and attributes. You can provide two metrics and two attributes in your clustered line bar chart. Now when two attributes are selected, a clustered graph grouped by primary and secondary attributes is displayed.</p> <p><a href="#">Bot Insight visualizations</a></p>
<p><b>New Device dashboard in the Operations dashboard</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Bot Insight Device dashboard displays various widgets that provide information about the utilization of the machines on which the bots are executed. You can analyze the device utilization and activity history of different Bot Runner machines.</p> <p><a href="#">Operations dashboard</a></p>

Fixed features	
Service Cloud case ID	Description
00540647	Dates are now displayed correctly on the dashboard after the data is grouped based on the date. Previously, incorrect dates were shown on the dashboard.

Deprecated feature
The <b>Widget Event Distribution by workbench</b> is removed and will no longer be displayed in the <b>Audit Dashboard</b> .

## Automation Anywhere Robotic Interface

### Introduction

Automation Anywhere Robotic Interface (AARI) enables users to design a process workflow to address their business requirements. The processes incorporate human and bot tasks using forms to define parameters and render supported UI elements on the web. When using AARI on the web, users create requests to use their created process workflow for process instances (case) and run their tasks.

AARI is available as a part of the Enterprise A2019 installer. You can view the AARI components in the **Administration** page.

[Configuration - set up roles](#)

---

**Important:** This AARI version has limited availability and is available only to sales and internal users.

---

Known limitations
<p>When you edit a checked-out process that contains conditional steps with variables, you cannot edit and save these conditional steps. The steps will revert any new variables you add.</p> <p><b>Workaround:</b> Delete and add a new condition.</p>
<p>The <b>If</b>, <b>Else If</b>, and <b>Else</b> actions cannot be placed before another bot logic in your workflow. You can only place these actions at the end of the bot logic.</p> <p><b>Workaround:</b> Make a clear boundary on the conditional block.</p>
<p>In a process, when you use a date format such as 2020/07/04 in the <b>input_date</b> field in <b>Bot Task</b>, the bot does not accept the date input.</p> <p><b>Workaround:</b> Create a separate date variable to use an input.</p>
<p>Form elements that are not supported and are deleted by the process editor include: <b>Button</b>, <b>Dynamic</b>, <b>Select File</b>, and <b>Snapshot</b>.</p> <p><b>Workaround:</b> Instead of using the <b>Button</b> element, add a form action.</p>
<p>The <b>Import bots</b> and <b>Export bots</b> user interface labels do not match for a process but are still applicable to importing or exporting a process.</p>
<p>When you access a public process, the <b>Request display name</b> field in <b>Process entry</b> is not locked and can be edited. The existing variable in the field can be changed but not saved.</p>
<p>The <b>Task display name</b> option in <b>Process entry</b> has a field set to <b>initialData</b> that cannot be edited in the process editor.</p>
<p>The <b>Feed data into form</b> table in the process editor does not allow editing.</p>
<p>The <b>Element name</b> field in the <b>Bot Task</b> and <b>Human Task</b> cannot contain spaces.</p>
<p>When you create two forms and assign the data of the first form to the second form using <code>FormStep.input[]</code>, the second form data is not evaluated.</p>
<p>Redo functions are only available for canvas interactions. The redo functions are not available by default until your first canvas interaction. The functions are available again when you interact with your second canvas.</p>
<p>A team name that has a length of 20 characters or more is not accepted.</p>

Known limitations	
<b>Limitations in AARI on the web</b>	
<b>Navigation bar</b>	When you open too many request tabs, the tabs are hidden in the navigation bar.
<b>Timestamp</b>	The timestamp of the closing step shows a duplicate timestamp of the starting step in request view.
<b>Imported process</b>	<p>When you export a process from an Control Room and import that process as public to another Control Room, the imported process cannot be viewed.</p> <p><b>Workaround:</b> You can check in and then check out the process, or import the process as private and then do a check-in.</p>
<b>Configuration page</b>	<p>In the device pool configuration page, the Bot Runner users check box cannot be deselected.</p> <p><b>Workaround:</b> Double-click the check box in the header.</p>
<b>Process management page</b>	A check-in process that is deleted from the Control Room repository is still visible in the process management page.
<b>Form rendering</b>	<ul style="list-style-type: none"> <li>• The <b>Masked data</b> option is not fully supported for all elements. When this option is added to hide data, the data is visible.</li> <li>• The <b>Checkbox</b> and <b>Radio Button</b> elements do not fully support horizontal format. When these elements are configured to display horizontally, the elements are displayed vertically instead.</li> <li>• The <b>Document</b> element is not fully supported. When this element is configured to a <b>Default file</b> path, the entire document is not rendered.</li> <li>• The <b>Number</b> element encounters issues with large numbers. When this element is configured to contain three number fields and number values with trailing zeroes, commas, and decimals, these values are not honored and are not rendered. When number values are entered in a number field, such as a phone number box, the number values are not accepted.</li> <li>• The <b>Text Box</b> element encounters issues with number-only input. When this element is configured in a form to submit data, the <b>Submit</b> option is not enabled when the field contains only numbers.</li> <li>• The <b>Password</b> element encounters issues with maximum character limits. The maximum limit is not enforced when a password is entered in the initial form. This element does not contain values when</li> </ul>

# Enterprise A2019.14 Release Notes

*Release date: 9 July 2020*

Review the new features, supported packages, changed features, fixed features, and known limitations in the Enterprise A2019.14 (Build 5322) release. There are no security fixes in this release.

- [Enterprise A2019](#)
- [IQ Bot A2019](#)
- [Bot Insight A2019](#)

## Enterprise A2019

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Migration from 11.x and 10.x to Enterprise A2019 (currently available only to those in the Migration Early Adopter Program)</b></p> <p>Enterprise A2019</p> <p>Migration to Enterprise A2019 is currently only available to select customers through our Migration Early Adopter Program. If you are interested in learning more about this program or a timeline for when migration will be available to all customers, contact your Automation Anywhere representative.</p> <ul style="list-style-type: none"> <li>• Workload management (WLM) data is automatically migrated to Enterprise A2019 when you install Enterprise A2019 and point the Control Room to the restored 11.x database. <ul style="list-style-type: none"> <li><a href="#">How WLM data is migrated</a></li> </ul> </li> <li>• Version 11.3.1 and Version 11.3 are certified for migration to Enterprise A2019. <ul style="list-style-type: none"> <li><a href="#">Migrate to Automation 360</a></li> </ul> </li> <li>• Additional support is provided for packages and variables. <ul style="list-style-type: none"> <li><a href="#">Package mapping for migration</a>   <a href="#">Variable mapping for migration</a></li> </ul> </li> <li>• Migrate TaskBots and MetaBots created in 10.x to Enterprise A2019 using APIs. <ul style="list-style-type: none"> <li><a href="#">10.x Migration APIs</a></li> </ul> </li> </ul>
<p><b>Bypass legal disclaimer</b></p> <p>Enterprise A2019</p> <p>When you allocate a device license to a user, the <b>Bypass legal disclaimer</b> option is automatically enabled to allow the user to run bots on the device without having to manually acknowledge a disclaimer.</p> <p><a href="#">Create a user</a></p>

<p><b>New features</b></p> <p><b>Choose to automatically update Bot agent</b> (Service Cloud case ID: 00497873)</p> <p>Enterprise A2019 and Community Edition</p> <p>An Control Room administrator can now choose to automatically update the Bot agent to a later version (<b>Administration</b> &gt; <b>Devices</b>) using the auto-update capability. In the earlier version, each Bot agent had to be updated manually after logging in to a device, resulting in more downtime.</p> <hr/> <p><b>Note:</b> In this release, Bot agent users have to update each Bot agent manually. From subsequent releases, the auto-update setting will be applied and each Bot agent will be updated automatically.</p> <hr/> <ul style="list-style-type: none"> <li>• For Cloud and Community Edition, the auto-update option is enabled by default.</li> <li>• For On-Premises, the default update option is set to manual.</li> </ul> <p><a href="#">Automatically update the Bot agent</a></p>
<p><b>Universal Recorder new features</b></p> <p>Enterprise A2019 and Community Edition</p> <ul style="list-style-type: none"> <li>• The Universal Recorder can now capture objects in SAP versions 730, 740, and 760 patch 5.</li> <li>• You can build automations in an SAP application using multiple connections (user accounts) and several sessions per connection at one time.</li> <li>• You can now record and run bots to capture objects from a Google Chrome browser that does not have a zoom level setting of 100%.</li> </ul>
<p><b>Capture active text, passive text, image button, and scroll in combo box in AISense Recorder</b></p> <p>Enterprise A2019</p> <p>You can now capture active text, passive text, image button, and scroll in a combo box from a remote application when recording a task with AISense Recorder.</p> <p><a href="#">Record a task with AISense Recorder</a></p>
<p><b>New Database package features</b> (Service Cloud case ID: 00537047)</p> <p>Enterprise A2019 and Community Edition</p> <ul style="list-style-type: none"> <li>• The <b>Connect</b> action now enables you to connect to an Excel database.</li> <li>• Use the <b>Export to data table</b> action to retrieve records from the database and store the retrieved data in a table variable.</li> <li>• You can now store the output of the <b>Run stored procedure</b> action in a dictionary variable.</li> </ul> <p><a href="#">Using Connect action for database</a>   <a href="#">Using the Export to data table action</a>   <a href="#">Using the Run stored procedure action</a></p>
<p><b>New Active Directory package available</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use actions from the Active Directory package to manage users across a group or organization. You can perform operations such as create, modify, and delete users, groups, or organizational units with centralized control.</p> <p><a href="#">Active Directory package</a></p>

New features
<p><b>Log in securely when connecting to Active Directory server</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can use the <b>Connect</b> action from the Active Directory to enter your credentials (username and password). You can either insert the credentials from the Credential Vault or insert a variable that holds a credential type value.</p> <p><i><a href="#">Using the Connect action</a>   <a href="#">Credentials and credential variables in the Bot editor</a>   <a href="#">Your variables (user-defined)</a></i></p>
<p><b>Support for Excel cell formats, including Number, Percentage, Currency, Scientific, and Date</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Get single cell</b> and <b>Get multiple cell</b> actions from the Excel basic package and the <b>For each row in worksheet</b> Loop iterator to retrieve values in the format set in the Excel worksheet. For example, a value from a cell of Currency formatting retains the currency symbol when passed to a table or record variable.</p> <p><i><a href="#">Excel basic package</a>   <a href="#">Loop package</a></i></p>
<p><b>Automate a task on a range of cells in an Excel worksheet</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Specify a cell range in the <b>Delete cells</b> action to perform the operation on the cells in the range.</p> <p><i><a href="#">Excel advanced cell operations</a></i></p>
<p><b>New PDF package action</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Merge multiple PDF files into a single PDF file using the <b>Merge documents</b> action.</p> <p><i><a href="#">Using the Merge documents action</a></i></p>
<p><b>Support for Czech and United States 2 code pages in Terminal Emulator package</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The TN3270E and TN5250E terminal types support the Czech and United States 2 code pages. Use the <b>Connect</b> action to select the terminal type and code page.</p> <p><i><a href="#">Using the Connect action</a></i></p>
<p><b>Proxy support for packages</b></p> <p>Enterprise A2019</p> <p>If a device is configured with a proxy, all outbound requests from the following packages are routed through the proxy server:</p> <ul style="list-style-type: none"> <li>• Recorder</li> <li>• REST Web Service</li> <li>• SOAP Web Service</li> </ul>

New features
<p><b>Form builder enhancements</b></p> <p>Enterprise A2019</p> <p>The form builder now includes the following new elements:</p> <ul style="list-style-type: none"> <li>• <b>Dynamic</b> - Enables dynamic rendering of the selected area.</li> <li>• <b>Snapshot</b> - Enables you to take a snapshot of the form.</li> </ul>
<p><b>Enhancements to actions in Interactive forms</b></p> <p>Enterprise A2019</p> <ul style="list-style-type: none"> <li>• Enhanced highlight action <p>The <b>Highlight</b> action in the Interactive forms includes a <b>Highlight type</b> drop-down menu. You can use <b>Warning</b> or <b>Error</b> to highlight the selected form element during the bot runtime.</p> </li> <li>• New <b>Change label</b> action <p>Use this action to change the label or title of the selected element of a specific form.</p> </li> <li>• Dynamic area action <ul style="list-style-type: none"> <li>• The <b>Add row in Dynamic area</b> action enables you to append or overwrite a dynamic element of a form.</li> <li>• The <b>Clear</b> action enables you to remove the dynamic elements.</li> </ul> </li> </ul> <p><i><a href="#">Interactive forms package</a></i></p>
<p><b>Retrieve trigger event data</b></p> <p>Enterprise A2019</p> <p>You can now retrieve the trigger event data during bot runtime by defining a variable as the input type.</p> <p><i><a href="#">Add a file and folder trigger</a></i></p>
<p><b>Record variable support for schema</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can create a new record variable with a schema to set the order of the fields and the type of data that can be entered into each field.</p> <p><i><a href="#">Record variable</a></i></p>
<p><b>Product interface now available in Russian language</b></p> <p>Enterprise A2019</p> <p>Enterprise A2019 is now available in Russian.</p> <p><i><a href="#">Internationalization, localization, and language support</a></i></p>

New features
<p><b>Clone and view content in Control Room</b></p> <p>Enterprise A2019</p> <p>The Control Room now includes the following new permissions:</p> <ul style="list-style-type: none"> <li>• <b>View content:</b> This permission allows you to view the contents of a cloned bot. This permission applies to both public and private workspaces.</li> <li>• <b>Clone:</b> This permission allows you to create a read-only copy of the bot from the public workspace. The same bot can be cloned by multiple users. This permission applies only to the public workspace.</li> </ul> <p><a href="#">Bot permissions for a role</a></p>
<p><b>New condition in the If and Loop packages</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Dictionary &gt; Check key</b> condition to execute actions based on whether the value of the specified key is <b>Equal to</b> or <b>Not equal to</b>, or <b>Contains</b> or <b>Does not contain</b> the target value.</p> <p><a href="#">If package</a>   <a href="#">Loop package</a></p>
<p><b>New encoding type in CSV/TXT and Log To File packages</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The UTF-16LE encoding option provides support for files that contain the byte order mark (BOM) Unicode character. In the <b>CSV/TEXT &gt; Open</b> action, selecting this option causes the BOM character to be ignored when data is retrieved from the file using a subsequent <b>Read</b> or <b>Loop</b> action. In the <b>Log to file</b> action, this option inserts a BOM character at the beginning of the file.</p> <p><a href="#">Using the Open action for CSV/TXT file</a>   <a href="#">Using Log To File action</a></p>
<p><b>Retrieve a list of available users using Device API</b></p> <p>Enterprise A2019</p> <p>Use the Device API to identify all available users with unattended Bot Runner licenses, or to filter for users by name. This API returns details of each user, including the user ID, username, and device name.</p> <p><a href="#">Device API</a></p>
<p><b>Manually configure time interval value of database connection retries property</b> (Service Cloud case ID: 00573167)</p> <p>Enterprise A2019 and Community Edition</p> <p>You can manually configure the time interval value of the database connection retries in the <code>cluster.properties</code> file. If the database is reconnected within the time specified in the <code>cluster.properties</code> file, the Apache Ignite cache node in the cluster setup will not restart the Apache Ignite server, keeping the device and the Control Room user connected. The default value of the time property <code>ignite.max.duration.db.connection.retries</code> in the <code>cluster.properties</code> file is 10000. The recommended maximum time for this property is up to 5 minutes (300000 msec).</p> <hr/> <p><b>Note:</b> Restart the Control Room services on each node for the manually configured value of the time property to work effectively. Also, set the time in milliseconds.</p> <hr/>

New features
<p><b>Run as user to default device mapping in Workload automation</b> (Service Cloud case ID: 00563115)</p> <p>Enterprise A2019 and Community Edition</p> <p>Workload automation now allows one-to-one (1:1) mapping of the <b>Run As</b> user with default devices when these devices are part of a device pool. Therefore, you can select default devices that are mapped to a Bot Runner to avoid auto-login failures in environments where the security policy does not allow a user to log in to any other device or devices.</p> <p><i><a href="#">Add queue, Bot Runner, and device pool</a></i></p>
<p><b>Authentication proxy support</b></p> <p>Support is now available for proxy authentication servers where any application going through the proxy is authenticated and authorized before accessing the internet.</p>

Supported packages	
Package	Version
Node Manager	12.1.6000
Application	2.0.0-20200624-041608
App Integration	1.0.0-20200624-041607
Analyze	2.2.3-20200624-011702
Active Directory	2.0.1-20200624-041605
Boolean	2.0.0-20200624-041610
Bot Migration	2.4.0-20200604-174031
Browser	2.0.0-20200624-041611
Clipboard	2.0.0-20200624-041619
Comment	2.0.0-20200624-041619
CSV/TXT	2.0.0-20200624-041620
Database	2.0.0-20200624-041623
Data Table	2.0.0-20200624-042148
Datetime	2.0.0-20200624-041628
Delay	2.1.0-20200624-041629
Dictionary	2.0.0-20200624-041629
Run DLL	2.0.0-20200630-062222
Email	2.0.0-20200624-041631
Error handler	2.0.0-20200624-041636
Excel basic	2.0.0-20200630-062144
Excel advanced	4.0.0-20200630-062063
File	2.1.0-20200624-041638

Supported packages	
Package	Version
File & folders	1.1.0-20200627-151822
Folder	2.1.0-20200624-041640
FTP / SFTP	2.0.0-20200624-041644
IF/ELSE	2.0.0-20200624-041646
Image Recognition	2.0.0-20200624-041747
Interactive forms	2.14.0-20200629-185534
IQ Bot	2.0.0-20200415-125005
JavaScript	2.0.0-20200630-062021
Simulate keystrokes	2.0.0-20200624-041915
Legacy Automation	2.0.0-20200624-041919 1.0.0-20200515-133334
List	2.0.0-20200624-041923
Log To File	2.0.0-20200624-041923
Loop	2.0.0-20200624-041924
Message Box	2.0.0-20200624-041925
Mouse	2.0.0-20200624-041929
Number	2.0.0-20200624-041934
OCR	2.1.0-20200630-062040
Office 365 Excel	2.0.0-20200630-062127
Office 365 Calendar	2.0.0-20200630-061819
Office 365 OneDrive	2.0.0-20200630-062133
PDF	2.1.0-20200624-042032
PGP	2.1.0-20200630-062139
Ping	2.0.0-20200624-042035
Printer	2.0.0-20200624-042042
Play Sound	2.0.0-20200624-042037
Prompt	2.0.0-20200624-042043
Python Script	2.0.0-20200624-042044
Recorder	2.0.6-20200626-193519
REST Web Service	2.0.0-20200624-042128
SAP	2.1.0-20200624-042131
Screen	2.0.0-20200624-042134
SNMP	2.0.0-20200624-042137

Supported packages	
Package	Version
SOAP Web Service	3.0.0-20200624-042140
String	3.0.0-20200624-042145
System	2.0.0-20200624-042146
Task	2.0.0-20200624-103759
Terminal Emulator	3.2.0-20200625-032209
Trigger Email	1.1.0-20200624-042201
VBScript	2.0.0-20200630-062305
Wait	3.0.0-20200624-042156
Window	2.0.0-20200624-042224
Workload	2.0.0-20200624-042158
XML	2.0.0-20200624-042200

Changed features
<p><b>Changes in the Database &gt; Run stored procedure action</b></p> <ul style="list-style-type: none"> <li>It is now optional to enter an input or output parameter name.</li> <li>You must specify the data type of an input parameter. Choose from Boolean, date, number, or string date type.</li> </ul>
<p>The terminal screen for ANSI and VT100 terminals now displays 24 rows, instead of 25 rows as in earlier versions.</p>
<p><b>Email &gt; Send action interface changes</b></p> <p>For the <b>Use secure connection (SSL/TLS)</b> and <b>My server requires authentication</b> fields, you must now select <b>True</b> or <b>False</b>, or insert a Boolean variable. Previously, the fields were activated by selecting a check box.</p>
<p><b>Import bots in public or private workspace</b></p> <p>Service Cloud case ID: 00456712</p> <p>Users can now import bots into the public workspace if they have the required permissions, regardless of their licenses. Additionally, users with a Bot Creator license can now import the bots either into the public or private workspace.</p> <p><a href="#">Import bots</a></p>

Fixed features	
Service Cloud case ID	Description
00554068	In the Community Edition, when you upgrade your Bot agent to a later compatible version, TaskBots created with system variables of numeric type now run successfully. The Control Room does not show a preprocessing error when you deploy the TaskBots.

Fixed features	
Service Cloud case ID	Description
00443421	The <b>Run stored procedure</b> action in the Database package runs as expected with Oracle Database when you use input and output parameters.
00557374	The Universal Recorder now consistently captures objects from an SAP application and identifies the technology for those objects as SAP when all prerequisites are met.
00611874	An error is no longer encountered when a variable containing Japanese characters is used in the <b>Write to file</b> action of the Data Table package.
00564534	A modified dependency file with the same name as the original file and a new size is now successfully checked in from the private to the public repository. The old file that was previously checked in is no longer referenced after the modified file is checked in to the public repository, thereby preventing a bot execution failure.
00570537	When you clone a bot with or without dependency files, the cloned bot now displays the actual file size for the bot and its dependency files.
00577247, 00587976	Fixed an issue where the <b>Email &gt; Move all</b> action did not move emails when a bot ran the action on an OS configured with the Japanese language setting.
00552729	The <b>PGP &gt; Decrypt</b> action now works for PDF files.
00487805	You can now access the TN3270 terminal without the terminal screen displaying all text with strike lines. Before using any type of terminal to execute terminal commands, install the latest VC ++ package.  <a href="#">Latest supported Visual C++ downloads</a>
00584051	Python 3 script now supports using Unicode characters in input variables. Bot error messages are no longer displayed when Python 3 is used to pass Japanese characters to a variable.
00540651, 00587963, 00593302	You can now use the <b>Assign, Join, Merge, and Sort</b> actions from the Data Table package when you change the default language from English to Simplified Chinese.  You can also use the <b>Assign</b> action when you change the default language from English to Japanese, Korean, and other non-English languages.
00577284	The <b>Split document</b> action in the PDF package now executes correctly for a horizontal PDF file, and the large-width output file is not cut off from the sides.
00595357	You can now export and import two different bots (with the same name) in different folders from a staging environment into a production environment.
00569527	You can now perform a check-in and check-out of bots with dependencies.

Fixed features	
Service Cloud case ID	Description
00574309	You can now update or remove <b>Cluster ip addresses</b> from the <b>Elastic search disaster recovery backup cluster</b> setting from the Control Room <b>Administration</b> page.
00525854	When a file type variable is used to open an Excel, CSV, or Java script file, bots can now be executed successfully when the file variable is used as an input.
00609184	After the existing license expires, the admin user can now successfully install a new Control Room license for a Control Room hosted on Linux CentOS.
00576202	You can now insert a user-defined string variable in a message box display when the string variable is included in the expression for multi-line values.
00560706	You can now view the actions menu (vertical ellipsis) to edit or delete the variable string name when the character length is more than 35 characters.
-	For the <b>Checkbox</b> element, changes made to the check box names in the <b>Checkbox content</b> field are now updated when you enable <b>Advance behaviors &gt; Make default selections</b> .
-	You can now set the default selection in <b>Advance behaviors</b> for the <b>Radio button</b> element in a form.
00557395	You can now check in bots that use the variable <code>\$prompt-assignment\$</code> without receiving an error message. Previously, when you opened the bot in List view, an error icon was displayed next to the actions that contain the variable.
00560356	Previously, when a task that consisted of one or more subtasks was run, the In Progress entry for the task was moved into a historical report with the completion of the first subtask, not the entire governing task. Now, the In Progress tasks are not moved to historical status until the completion of the entire task.
00556113	In Community Edition opened in Google Chrome, you can now select the device icon in a non-English language, and the <code>[link]</code> and <code>[icon]</code> tags are no longer displayed.
00559360	You can now re-import a bot that has failed previous imports. The <code>query did not return a unique result: 2</code> displayed during re-import attempts is now fixed.
00443590	Fixed an issue where after a bot is deployed on a Bot Runner device, that device is in a different state compared to the state before the bot deployment. For example, if a Bot Runner device is locked before bot deployment, after it is unlocked to deploy the bot, it will now be moved back to lock status.
00559507, 00594149	Support for scheduling bots with Internet Explorer version 11 is now improved. Users in the Control Room can scroll through multiple pages of scheduled bots without issues with scrolling through the interface.

Known limitations
<p>In Enterprise A2019 On-Premises, a security scan might report the Recorder package as malware because the <code>check.exe</code> file is missing the root identification certificate.</p> <p>You can contact Automation Anywhere Support to get an updated package with the signature fix and upload it to your Control Room.</p> <p><a href="#">Add packages to the Control Room</a></p>
<p>Version 10.x or 11.x bots containing commands that have white space in the credential attributes cannot be migrated to Enterprise A2019. The migration process stores some credential attributes in global values in Enterprise A2019. Global values do not support white spaces.</p> <p>To migrate bots that use credential attributes, you can remove the white spaces or replace them with characters.</p>
<p>If you use the <b>Get</b> action for an empty dynamic element of a form, errors are displayed during bot runtime.</p>
<p>If you use <b>Trigger loop: Handle</b> within a bot, link it to a form with <b>Select File</b> element, and set the <b>Select action trigger &gt; Lost focus</b>, the next event is not triggered when you click <b>Browse</b>.</p>
<p>The <b>Set focus</b> action in <b>Interactive forms</b> does not work when you use it to link the fields between two different forms.</p>
<p>In the form builder screen, text is displayed in English even when you change the display to non-English language.</p>
<p>You might see the schedule automation name instead of the Workload automation name in the <b>Workload &gt; Queue &gt; View Activity in progress</b> and <b>Run bot with queue &gt; View</b> pages when Work Items are processed for automation in the Bot agent. This occurs if the Workload automation ID and schedule automation ID are the same in the Control Room database.</p>
<p>The <b>Task bot &gt; Run</b> action only supports files selected from the Control Room repository. Also, this action only supports file type variables with a set default value and the <b>input</b> option disabled. You cannot modify the file variable value using the <b>File &gt; Assign</b> action.</p>
<p>When you edit a bot using a previous package version (for example, an Enterprise A2019.13 version) and the Desktop session automatically starts, if you exit the Bot editor while the Desktop session is trying to launch, the previous package version will be displayed when you open a new Bot editor instance. However, you should see the Enterprise A2019.14 package version associated with the new Bot editor instance. If you close and reopen the new Bot editor instance, the Enterprise A2019.14 package version will be displayed.</p>

Known limitations
<p>There is an issue for a specific, manually generated license key file supplied by Automation Anywhere to upgrade from Enterprise A2109.13 to Enterprise A2019.14.</p> <p>This issue applies <b>only</b> to customers who are in the following specific category (<b>all</b> must be true):</p> <ol style="list-style-type: none"> <li>1. Control Room is at the customer premises</li> <li>2. Control Room is running Enterprise A2019.13 or earlier</li> <li>3. Installed a license file that was provided to them in July 2020 (not self-generated through the customer self-service license portal)</li> <li>4. User has upgraded the On-Premises Control Room to Enterprise A2019.14.</li> </ol> <p>For this issue, contact Automation Anywhere for updated license files.</p> <hr/> <p><b>Important:</b> Users who self-generated their license files through the A-People License portal are not affected by this issue. Cloud customers are also not affected by this issue.</p> <hr/> <p>A bot that contains the <b>Capture</b> action from the Recorder package fails when both the <code>HTML InnerText</code> and <code>InnerHTML</code> object properties are selected.</p> <p><b>Workaround:</b> Select only one of the object properties.</p> <hr/> <p>The Universal Recorder fails to perform a click, set text, or append text action on the correct control when a debug window or download bar is open. This occurs only in the Google Chrome browser with the device display set to 100%.</p> <p><b>Workaround:</b> Disable the Google Chrome download bar.</p>

## IQ Bot

The IQ Bot A2019 On-Premises version supports all the features and functionality available in IQ Bot Version 11.3.4.2.

[Automation 360 IQ Bot feature comparison matrix](#)

Review the compatibility of the IQ Bot On-Premises version with the corresponding Control Room On-Premises version.

[Automation 360 IQ Bot version compatibility](#)

The IQ Bot A2019 Cloud version is available for this release and supports all features and functionality available in IQ Bot Version 11.3.4.2. This version provides users with automatic provisioning for up to three environments such as Development, Test, and Production. Users can migrate learning instances between environments using APIs.

New features
<p><b>Delete bot option in IQ Bot Designer</b> (Service Cloud case ID: 00096258, 00595526)</p> <p>IQ Bot On-Premises and Cloud</p> <p>Users with Edit bot permission can view and use the <b>Delete bot</b> option in the Designer. After a bot is deleted from the system, it will not be displayed in the <b>Learning Instance</b> or <b>Bots</b> listing pages.</p> <p>IQ Bot removes all document details from staging, and all unprocessed production documents are moved to the Validator.</p> <hr/> <p><b>Note:</b> The <b>Migration Utility</b> &gt; <b>Import/Export</b> functionality is not affected in any way by the Delete bot feature.</p> <hr/> <p><a href="#">Bots</a></p>
<p><b>Extract data from a table that spans across multiple pages</b> (Service Cloud case ID: 00371795)</p> <p>IQ Bot On-Premises and Cloud</p> <p>IQ Bot can now extract data successfully from an entire table that spans across multiple pages and has a table header only on the first page.</p>
<p><b>Add fields and field alias to custom domain</b> (Service Cloud case ID: 00471075)</p> <p>IQ Bot On-Premises and Cloud</p> <p>You can now add additional fields (form or table) and field aliases to a custom domain for an existing learning instance.</p>
<p><b>Alert for successful or pending document validations</b></p> <p>IQ Bot On-Premises and Cloud</p> <p>Document validation status is now displayed on the <b>Learning instances</b> page. A green icon is used for all successful document validations, and a red icon shows any pending validations.</p>

Changed features
<p><b>Import custom domains from the staging to the production server in any order</b> (Service Cloud case ID 00472445)</p> <p>You can now edit and update an existing custom domain multiple times and import them to the production server multiple times, and in any order, before importing the learning instances. After importing the learning instances, the system classifies all documents in the production server correctly, allowing for successful processing of documents.</p> <p><a href="#">Custom domains in IQ Bot</a></p>

Changed features
<p><b>Validator enhancements</b> (Service Cloud case ID: 00470258)</p> <p>Some of the Validator enhancements are as follows:</p> <ul style="list-style-type: none"> <li>You can now hide the <b>Skip to next file</b> and <b>Mark as Invalid</b> options using configuration settings. The options are currently enabled by default.</li> </ul> <p>To enable the option to hide them, contact Automation Anywhere Support.</p> <ul style="list-style-type: none"> <li>You can now hide the <b>Hide successful fields</b> and <b>Hide optional fields</b> options using configuration settings. The options are enabled by default.</li> </ul> <p>To enable the option to hide them, contact Automation Anywhere Support.</p> <hr/> <p><b>Note:</b> Selecting the <b>Hide successful fields</b> and <b>Hide optional fields</b> check boxes hides all the valid fields and reduces the display of a large number of fields, thus making correction easier. However, if there is an invalid field, it continues to be displayed because the invalid field requires correction.</p> <hr/> <ul style="list-style-type: none"> <li>Clicking in any column field expands the column width to accommodate the text entry. The Validator shows the value of the field that is being validated, in the document.</li> <li>Draw an area around single or multiple values in the document image to automatically populate a field in the Validator. This function is similar to the Designer.</li> </ul>

Fixed features	
Service Cloud case ID	Description
00552830	You can now use the unique validation link to access the documents without any errors.
-	When you use table extraction from a document with multiple tables, the data from the specified table is now extracted correctly.
00551886	Unicode issue with table validation for Asian languages is now resolved.
00538480	The <b>Options</b> method is now disabled for HTTP requests.
00538480	Cross origin resource sharing is now restricted in IQ Bot.
00421067	The activities time stamp is now captured correctly in the Control Room <b>Audit Logs</b> tab.
00522817	The <b>TestRun</b> output of a custom logic now displays the characters without any distortion, irrespective of the language you select.
00605420, 00605741, 00606561	After upgrading to IQ Bot Cloud if you restart the Control Room, you can now view or create learning instances immediately without restarting the IQ Bot service.

Known limitations
<p>IQ Bot On-Premises and Cloud</p> <p>If you create a learning instance and click <b>Learning instances</b> &gt; <b>Edit</b>, a blank page is displayed.</p> <p><b>Workaround:</b> Clear your browser cache and try to edit the learning instances.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>If you log in to the Control Room as an IQ Bot administrator, a 502 system error is displayed when you click the <b>IQ Bot</b> tab in the navigation bar.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>You can view the <code>ValidatorURL</code> error message for a validated document along with the corrected field in the <code>.csv</code> output file.</p>
<p>IQ Bot On-Premises and Cloud</p> <p>In Internet Explorer, you cannot save a document or mark it as invalid in the learning instances validator screen.</p> <p><b>Workaround:</b> Use the Google Chrome browser to access the learning instances validator screen.</p>
<p>IQ Bot Community Edition</p> <p>If you remove a bot (<b>Delete a bot</b>) associated with the document from the staging environment, you must create a group before uploading this document to the production environment. However, after deleting the bot from the staging environment, you cannot create or edit the group when you upload the same document to the production environment.</p>

## Bot Insight A2019

New features
<p><b>Line Bar Chart widget available</b></p> <p>Enterprise A2019</p> <p>The <b>Line Bar Chart</b> widget enables you to view and analyze information about your metrics and attributes. You can input two metrics and one attribute and display a bar graph when only one attribute is selected or display a clustered graph when two or more attributes are selected. You can use <b>Date</b> types as interval options, grouped by <b>Day</b>, <b>Week</b>, <b>Month</b>, and <b>Year</b>.</p> <p><a href="#">Bot Insight visualizations</a></p>
<p><b>Advanced settings for a query</b></p> <p>Enterprise A2019</p> <p>You can use the <b>Advanced Settings</b> option to configure more of your queries when you create a new widget. You can now set limits to your attribute values as grouped by <b>10</b>, <b>20</b>, <b>50</b>, and <b>100</b> values. You can also sort your data by ascending or descending order.</p> <p><a href="#">Configuring a Line Bar Chart query</a></p>

## Enterprise A2019.13 Release Notes

*Release date: 15 June 2020*

Review the new features, supported packages, changed features, fixed features, and known limitations in the Enterprise A2019.13 release. There are no security fixes in this release.

A2019.13 Build 4701 is available for Cloud customers, and Build 4705 is available for On-Premises customers. Community Edition remains on A2019.12 and will be upgraded to A2019.14 upon availability.

- [Enterprise A2019](#)
- [IQ Bot](#)
- [Bot Insight](#)

### Enterprise A2019

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Migration from 11.x and 10.x to Enterprise A2019 (currently available only to those in the Migration Early Adopter Program)</b></p> <p>Migration to Enterprise A2019 is currently only available to select customers through our Migration Early Adopter Program. If you are interested in learning more about this program or a timeline for when migration will be available to all customers, contact your Automation Anywhere representative.</p> <ul style="list-style-type: none"> <li>• The Insert work item command, WLM queues, and device pools are now migrated to Enterprise A2019.</li> <li>• Schedules are migrated when you copy 10.x data to Enterprise A2019 or update 11.x data to Enterprise A2019. You then have to remap some dependencies to enable the migrated schedules.</li> </ul> <p><a href="#">Enable schedules after migration</a></p> <ul style="list-style-type: none"> <li>• Additional support is provided for packages and variables.</li> </ul> <p><a href="#">Package mapping for migration</a>   <a href="#">Variable mapping for migration</a></p>
<p><b>Use Automation Anywhere Mobile for Enterprise A2019</b></p> <p>Manage bots, view real-time data visualizations in operational and business dashboards, and upload documents for IQ Bot processing through the Automation Anywhere Mobile app.</p> <p>Automation Anywhere Mobile supports touch ID login.</p> <p><a href="#">Automation Anywhere Mobile app</a></p>
<p><b>Record tasks with a device display setting of 125% or 150%</b></p> <p>You can now record tasks using Universal Recorder in Java, Microsoft Active Accessibility, and Microsoft UI automation applications on a computer that has a device display setting configured at 125% or 150%, in addition to the existing setting of 100%.</p>

New features
<p><b>Export bots without enabling SMTP in Bot Lifecycle Management</b></p> <p>When you export a bot, you can now download the exported package even when SMTP is not enabled. The link to download the exported package is available in the <b>ACTIVITY &gt; Historical</b> page.</p> <p><a href="#">Export bots</a></p>
<p><b>Export and import files using BLM APIs</b></p> <p>Use the Bot Lifecycle Management (BLM) export and import APIs to move bots from one environment to another based on your organization's automation requirements.</p> <p>You can export bots with dependent files and command packages from the public workspace of one Control Room and import them to a private workspace in another Control Room, and check them into a public workspace. To export and import bots, you must have the Export bots, Import bots, View and Manage packages, and Check in and Check out permissions to the necessary folders and have the Bot Creator license.</p> <p><a href="#">Bot Lifecycle Management API</a></p>
<p><b>Capture scroll action and table using AISense Recorder</b></p> <p>You can now capture the scroll action in an application window and table control from a remote application when recording a task with AISense Recorder.</p> <p><a href="#">Record a task with AISense Recorder</a></p>
<p><b>Form builder enhancements for interactive forms</b></p> <p>The form builder includes the following elements:</p> <ul style="list-style-type: none"> <li>• <b>Select File:</b> To enable file upload in the form.</li> <li>• <b>Dropdown:</b> To create a drop-down menu in the form.</li> </ul> <p><a href="#">Create a form</a></p>
<p><b>Extract text from a specific area in a window</b></p> <p>Use the <b>App Integration &gt; Capture area</b> action to extract text from within the captured area of a window and save it to a string variable.</p> <p><a href="#">App Integration package</a></p>
<p><b>Read string variable values from a text file</b></p> <p>Use the <b>String &gt; Import string from text file</b> action to read values from a text file and save them to a string variable.</p> <p><a href="#">String package</a></p>
<p><b>Automate in IBM-5555 terminals using the Terminal Emulator package</b></p> <p>The TN5250E terminal type now supports the IBM-5555-C01 and D01 terminal models.</p> <p><a href="#">Terminal Emulator package</a></p>
<p><b>Specify events within email trigger</b></p> <p>For email triggers, specify an event within the server type (Outlook, Email, or EWS server) to trigger a bot.</p> <p><a href="#">Add an email trigger</a></p>

New features	
<p><b>Use hot key for interface trigger</b></p> <p>For interface triggers, you can select hot key as one of the conditions to trigger the bot</p> <p><a href="#">Add an interface trigger</a></p>	
<p><b>Assign action in interactive forms package</b></p> <p>The interactive forms package now includes an <b>Assign</b> action that you can use to assign values dynamically in the <b>Dropdown</b> element of a form.</p> <p><a href="#">Interactive forms package</a></p>	
<p><b>Create a shortcut of a file or folder</b></p> <p>Use the <b>Folder &gt; Create shortcut</b> or <b>File &gt; Create shortcut</b> action to create a shortcut in the specified destination file path. The shortcut is dependent on the source file or folder. If you make changes to the source file or folder, the changes will also apply to the shortcut.</p> <p><a href="#">File package</a>   <a href="#">Folder package</a></p>	
<p><b>New conditions in the If and Loop packages</b></p> <ul style="list-style-type: none"> <li>• Use the <b>Data table &gt; Data table is empty</b> condition to execute actions based on whether the specified table contains values.</li> <li>• Use the <b>Data table &gt; Number of columns</b> and <b>Data table &gt; Number of rows</b> conditions to execute actions based on whether the number of columns or rows is <b>Equal to, Greater than,</b> or <b>Less than</b> the specified value.</li> </ul> <p><a href="#">If package</a>   <a href="#">Loop package</a></p>	
<p><b>Generate a random string of a user-specified number of characters and assign it to a string variable</b></p> <p>Use the <b>String &gt; Random</b> action to generate a string of uppercase and lowercase alphanumeric characters. You can specify the number of characters that the generated string consists of, with a maximum of 300 characters.</p> <p><a href="#">String package</a></p>	
<p><b>Upgrading Enterprise A2019 enables pre-filling installation parameters</b></p> <p>If you are upgrading from one Enterprise A2019 version to another, you have the option to pre-fill the installation parameters with existing installation content. Existing installation parameters include, for example, the installation path, HTTPS ports, database names, IP addresses, and TLS configuration. The username and password have to be manually entered.</p> <p>Note that this is applicable only to a Windows-based installation.</p> <p><a href="#">Run Control Room installer</a>   <a href="#">Installing Control Room on Linux</a></p>	

Supported packages	
Package	Version
Node Manager	7.1.5207
Application	2.0.0-20200515-071407
App Integration	1.0.0-20200515-071406

Supported packages	
Package	Version
Analyze	2.2.2-20200515-101604
Boolean	2.0.0-20200515-071408
Bot Migration	2.4.0-20200604-174031
Browser	2.0.0-20200515-071410
Clipboard	2.0.0-20200515-071418
Comment	2.0.0-20200515-071418
CSV/TXT	2.0.0-20200515-071419
Database	2.0.0-20200515-071421
Data Table	2.0.0-20200515-071731
Datetime	2.0.0-20200515-071424
Delay	2.1.0-20200515-071425
Dictionary	2.0.0-20200418-005349
Run DLL	2.0.0-20200515-071713
Email	2.0.0-20200515-071427
Error handler	2.0.0-20200515-071432
Excel basic	2.0.0-20200515-071623
Excel advanced	4.0.0-20200604-173722
File	2.1.0-20200515-071434
File & folders	2.0.0-20200317-030352
Folder	2.1.0-20200515-071436
FTP / SFTP	2.0.0-20200515-071439
IF/ELSE	2.0.0-20200515-071441
Image Recognition	2.0.0-20200515-071454
Interactive forms	2.12.0-20200420-084203
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20200515-071459
Simulate keystrokes	2.0.0-20200515-071502
Legacy Automation	2.0.0-20200515-133330 1.0.0-20200515-133334
List	2.0.0-20200515-071509
Log To File	2.0.0-20200515-071509
Loop	2.0.0-20200515-071511
Message Box	2.0.0-20200515-071511

Supported packages	
Package	Version
Mouse	2.0.0-20200515-071517
Number	2.0.0-20200515-071522
OCR	2.1.0-20200516-083309
Office 365 Excel	2.0.0-20200515-071608
Office 365 Calendar	2.0.0-20200515-071414
Office 365 OneDrive	2.0.0-20200515-071614
PDF	2.1.0-20200515-071618
PGP	2.1.0-20200515-071620
Ping	2.0.0-20200515-071621
Printer	2.0.0-20200515-071626
Play Sound	2.0.0-20200515-071622
Prompt	2.0.0-20200515-071627
Python Script	2.0.0-20200515-071628
Recorder	2.0.5-20200523-020302
REST Web Service	2.0.0-20200515-071712
SAP	2.1.0-20200515-071715
Screen	2.0.0-20200515-071718
SNMP	2.0.0-20200515-071720
SOAP Web Service	3.0.0-20200515-071723
String	3.0.0-20200515-071729
System	2.0.0-20200515-071729
Task	2.0.0-20200519-082744
Terminal Emulator	2.0.0-20200515-071735
Trigger Email	1.1.0-20200515-022805
VBScript	2.0.0-20200515-071737
Wait	3.0.0-20200515-071739
Window	2.0.0-20200515-071753
Workload	2.0.0-20200422-054201
XML	2.0.0-20200515-071743

#### Changed features

The **Dictionary > Put** action is now the **Dictionary > Set value** action. When you provide the key name, if the key does not already exist, this action creates a new key-value pair. In addition, you can now manually enter a value; previously, you had to select from a list of variables.

Changed features
In the <b>Excel advanced &gt; Get worksheet as data table</b> action, the <b>Tick if the first row is the header</b> option is now the <b>Sheet contains header</b> option. There is no change in functionality.
The <b>File &gt; Rename</b> and <b>Folder &gt; Rename</b> actions now accept the full file path in the <b>New file name</b> and <b>New folder name</b> fields. Previously, these fields only accepted the new file or folder name.
When you select a file from the desktop for the JavaScript, Python Script, or VBScript packages, it is no longer necessary to isolate that file in a separate folder. Previously, when you selected a file with the <b>Open</b> action, all the files in that folder were selected too.
The <b>Database &gt; Run stored procedure</b> action now has a different interface that enables you to configure input parameter values and output parameter data types. This action is not backward-compatible because the user interface controls and input data type have changed. You must modify the <b>Run stored procedure</b> action fields in the bots that contain previous versions of this action.
The Cloud License feature is now enabled by default in the Control Room.

Fixed features	
Service Cloud case ID	Description
00492377, 00511639	Bots using the Image Recognition action can now recreate the recorded activity and run successfully.
00599586, 00600149, 00601142, 00599483	The <code>Processing failure</code> error encountered when using the <b>Wait for condition</b> action is now fixed. Bots using this action now run successfully.
00583248	During Work Item consumption, a running task is no longer canceled when the next bot is deployed.
00548456	The Workload Management v3 APIs are now successfully executed in Swagger and do not fail because of a case-sensitive issue.
00601083	For Cloud deployment, users can now successfully export bot files and download them without any errors.
00568664	The <b>Git integration</b> option is now displayed for admin users when they navigate to <b>ADMINISTRATION &gt; Settings</b> in the Control Room.
--	The minimum length value of a form element cannot be 0. If you set the value as 0 in <b>Character limit &gt; Min</b> field, the <b>Make field required</b> is disabled.
00571125	When you check in a non-bot file by itself, the file is now checked in without any error. Older files that exist in Build 4111 are also unlocked and checked in after upgrading to Build 4705.
--	The form preview feature is now consistent across the Internet Explorer and Google Chrome browsers.
--	A blank page is no longer displayed when you paste content into any of the existing form elements on the form builder.

Fixed features	
Service Cloud case ID	Description
--	A form that is linked to a bot through the <b>Display</b> action of interactive forms is now displayed in front of all other windows when the <b>Always display form window in front</b> option is selected.
--	When a user login failed due to a Global Catalog (GC) availability issue, the response only indicated a communication error. The process now checks for errors and exceptions in the GC and processes the authentication with appropriate messages, so users can take appropriate action.
00520394	The VBScript package actions now support Unicode characters.
00536881	When you delete a bot, any trigger that is associated with it is also deleted and is not listed in the <b>Activity list</b> page.
00506169	You can now use the interface trigger to run a bot without any errors in the Japanese operating system.
00537640, 00538369	When you check out a bot from the Control Room and add a trigger, you can now use <b>Run with triggers</b> to run this bot without any errors.
00531912	JavaScript package actions can now be used to parse the values in a list.
00475183	Double-byte characters returned unreadable ANSI characters in the bot Log To File text. This issue is now fixed and ANSI encoding takes the system default charset.
00475129	You can now use double-byte characters in a variable name.
00511675	The <b>Excel advanced &gt; Find</b> action now searches for values in merged cells when the <b>By rows</b> search option is used.
00468103, 00475142	Bot names using Unicode characters, such as German umlaut, Japanese characters, and others, display correctly in the pop-up window at runtime.
00552701, 00558919	You can now select multiple actions from the Bot editor and drag them into a <b>Step, Loop, or If</b> action.
00507240	Fixed an issue where a running parent bot could not be stopped after it ran a child bot. Now you can stop a bot at any time.
00482810	VBScript actions can now run scripts that contain Unicode characters.
00472684, 00541922, 00551632, 00534508, 00570602	The <b>Email &gt; Send</b> action now supports a user-input port number for sending emails from an SMTP server, such as AWS Simple Email Service. Previously, the action only used port 25, even if the user entered a different port number.
00475230	Fixed an issue where the <b>String &gt; Replace</b> action did not support an empty string in the <b>Replace with</b> field. You can now use the action to replace a specific string with an empty string.

Fixed features	
Service Cloud case ID	Description
00472665	When a child bot shows an error, the parent bot now handles the exception by running the <b>Error Handler &gt; Catch</b> action. Previously, the parent bot was also showing an error, even when it contained Error handler actions.
00566476, 00560339	Fixed an issue where bots that contain the <b>Capture</b> action stopped working when running the action during deployment, or they could not be checked out after they were checked-in for editing.
00537139	A bot running the <b>Capture</b> action can now capture specific objects from a Google Chrome browser on a device running the Windows 10 operating system. In some cases, bots running the <b>Capture</b> action from Version A2019.11 On-Premises could only capture the entire browser window.
00421864	The <b>Create a bot</b> screen now displays properly in Internet Explorer. Previously, some display issues occurred where the screen was cut on the right side and the screen could not be moved.
00584341	Fixed an issue where some of the historical activity entries were incorrectly displayed. These entries are now displayed correctly when a user drills down for more information.

Known limitations
When you create a Dictionary/Table variable and use it in the <code>name</code> field of the PROPERTIES control, the bot does not deploy successfully. This issue occurs because Dictionary/Table variables are not supported for the <code>name</code> field in the PROPERTIES control. You can pull the <code>name</code> value into a String or Number variable before using it in the PROPEPTIES control, and then use that String or Number variable in it.
You can use Swagger to export bots but not to download exported bots. You have to use the REST Client to download exported bots.
When you run a bot, the runtime window is minimized after you preset the desktop.
The OSS Disclosure report provided in the A2019 installer is outdated. Starting from this release, you can log in to Automation Anywhere Support site and download the updated report: <a href="#">A-People Downloads page (Login required)</a> .
When you capture a table control from an application using the AISense Recorder, you cannot set text using the <b>Set text</b> option from the <b>Actions</b> list. You can set text in the table by capturing a cell from the table as a text box and then using the <b>Set text</b> option from the <b>Actions</b> list.
When upgrading from one Enterprise A2019 version to another, you have the option to pre-fill the installation parameters with existing installation content, but only if you used the default installation path <code>C:\Program Files</code> .
<b>Note:</b> This is applicable only to a Windows-based installation.

Known limitations
Based on the permission assigned by an administrator, users can only view the <b>Public</b> tab that lists the available forms and bots. However, users can edit an available form or bot by replacing <b>View</b> with <b>Edit</b> in the Control Room URL.
When you create a bot and link a form to it, the bot is included only when you check in the form; it is not available on form check-out.
When you click multiple icons (Copy, Cut, and Paste) at the top of the form builder or bot creator page, the tooltips overlap.
Issues in the form builder: <ul style="list-style-type: none"> <li>• If you drag any form element into a specific position on the form builder, it always appears at the bottom of the available elements.</li> <li>• If you drag form elements around in the form builder screen in Internet Explorer, the mouse pointer flickers continuously.</li> <li>• For the <b>Radio button</b> element, you cannot set the default selection in <b>Advance behaviors</b>.</li> <li>• For the <b>Checkbox</b> element, changes made to the check box names in the <b>Checkbox content</b> field are not updated when you enable <b>Advance behaviors &gt; Make default selections</b>.</li> </ul>
When a bot runs Terminal Emulator package actions in an IBM-5555 terminal, the terminal window does not display double-byte characters, including Chinese and Japanese characters.
If you used the Universal Recorder to capture a menu item from a Microsoft Active Accessibility application on a computer that has a display scale setting configured to 100%, at runtime the bot does not click the correct menu item on a computer that has a display scale setting configured to 125% or 150%.
During GUID provisioning, License Sync is called internally after a successful installation. If the internal License Sync fails but the installation is successful, users can log in and continue to work.
When a task that consists of one or more subtasks is run, the In Progress entry for the task is placed into a historical report upon completion of the first subtask, not the entire governing task.
An error occurs if the parent bot contains actions for objects captured using the AISense Recorder and the child bot contains actions for objects captured using the Universal Recorder, or vice versa.

## IQ Bot

The IQ Bot On-Premises version supports all the features and functionality available in IQ Bot Version 11.3.4.2.

[Automation 360 IQ Bot feature comparison matrix](#)

Review the compatibility of the IQ Bot On-Premises version with the corresponding Control Room On-Premises version.

[Automation 360 IQ Bot version compatibility](#)

The IQ Bot Cloud version is available for this release and supports all features and functionality available in IQ Bot Version 11.3.4.2. This version provides users with automatic provisioning for up to three environments such as Development, Test, and Production. Users can migrate learning instances between environments using APIs.

For the Custom Logic feature, there is an identified list of Python libraries and packages that are safe to use for IQ Bot Cloud. Use only these packages to ensure security for your cloud infrastructure, file systems, databases, and network resources.

*List of Pandas Libraries which are supported and not supported on Automation 360 IQ Bot (A-People login required)*

New features
<p><b>Migrate data to a unified database</b></p> <p>IQ Bot On-Premises and Cloud</p> <p>The Database Migration Assistant enables you to migrate data from IQ Bot Version 6.5 or later databases to a unified database in IQ Bot A2019.</p> <p><i>Migrate earlier IQ Bot versions to Automation 360 IQ Bot On-Premises</i></p>
<p><b>Support for custom validation Python scripts</b></p> <p>IQ Bot Cloud</p> <p>You can use custom logic in Python to modify intermediate extracted data in IQ Bot.</p> <p><i>Add custom logic in IQ Bot to improve extraction</i></p>
<p><b>Select an OCR engine when creating a learning instance</b></p> <p>IQ Bot On-Premises and Cloud</p> <p>You can select different OCR engines directly from the UI based on your requirements for data extraction from specific document types, when creating a new learning instance. You do not have to stop and restart IQ Bot services for implementing the engine change.</p> <p><i>Select an OCR engine</i></p>
<p><b>Enable or disable PDFBox option</b></p> <p>IQ Bot On-Premises and Cloud</p> <p>You can enable or disable the <b>My PDF documents do not have images</b> check box directly in the UI when creating a learning instance.</p> <p><i>Disable PDFBox option</i></p>

Changed feature
<p>The draw box icon for document values is no longer available. However, you can still click and drag a box on the document to draw boxes for the labels along with the values.</p>

Fixed features	
Service Cloud case ID	Description
--	A new REST API is now available that contains the IQ Bot validator URLs of all the available documents that are not locked by any users. A validator URL retrieved from the REST API can be used in any browser to navigate directly to that specific document.
00343034	You are now redirected to a specific document using the validator URL after a successful login.
00471068, 00339407	The draw box functionality for field labels now ensures that the selected value is treated as an entire word rather than distinct characters. You can now select multiple system identified regions (SIRs) or a specific part of a single SIR from a field label, which enables accurate data extraction.

Fixed features	
Service Cloud case ID	Description
--	The PDF Box feature now enables you to generate an SIR for a PDF file that contains content in multiple formats.
00481720	The Service account user password can now include special characters. The service account will not be locked and all the IQ Bot services will start successfully after an installation, irrespective of whether the password has special characters.
00510286, 00548393	When the Automation Anywhere Cognitive Application service restarts after installing IQ Bot Build 4705, the user login information is now captured without any duplication.  However, if you upgrade from any earlier version of IQ Bot to IQ Bot A2019.13 (Build 4705), you must deregister and register IQ Bot services.
00522978	When you now install IQ Bot, the user account is not locked even when the password has special characters, and all the IQ Bot services start without any issues.
00581425, 00581949, 00604394, 00602630	You can now register IQ Bot with child tenant using API, which enables you to view all the available domains and learning instances.
00575939, 00417631, 00423076	The <code>.csv</code> file is now displayed in the <b>Output</b> folder when you upload a document with a long filename (more than 60 characters) using <b>IQ Bot Upload</b> .

Known limitations
<p><b>IQ Bot On-Premises</b></p> <p>The OSS Disclosure report provided in the IQ Bot A2019 installer is outdated. Starting from this release, you can go to Automation Anywhere support site to download the updated report: <a href="#">A-People Downloads page (Login required)</a>.</p>
<p><b>IQ Bot On-Premises and Cloud</b></p> <p>Images on the Designer in IQ Bot appear distorted while scrolling in Internet Explorer.</p>
<p><b>IQ Bot On-Premises and Cloud</b></p> <p>Installation errors are displayed for the Database Migration Assistant.</p> <p><b>Workaround:</b> Install the <code>MsSqlCmdLnUtils</code> utility and <code>Microsoft ODBC Driver 17 for SQL Server</code> before installing the Database Migration Assistant.</p>
<p><b>IQ Bot On-Premises and Cloud</b></p> <p>Logs are not captured if the Database Migration Assistant installation fails.</p>
<p><b>IQ Bot Cloud</b></p> <p>System suggestions are not updated when documents are validated by the user.</p> <p><b>Workaround:</b> Users must update the correction manually in the validator for IQ Bot Cloud if the system suggestions are not displayed.</p>

## Bot Insight

New features
<p><b>Compare mode widget filter</b></p> <p>The Bot Insight compare mode introduces widget filters that you can apply to your existing dashboards. A new <b>Filter</b> option shows a <b>Filter</b> window with the <b>Attributes</b>, <b>Numeric</b>, and <b>Time</b> widgets.</p> <p><a href="#">Comparing dashboards</a></p>
<p><b>Hourly support for widgets</b></p> <p>The Bot Insight widgets include an <b>Hour</b> interval option in the <b>Group By</b> field for <b>Date</b> type. The analytics for this widget groups your data by hourly intervals and displays the chart accordingly.</p> <p><a href="#">Using widgets</a></p>
Changed features
<p><b>Power BI connector</b></p> <p>You can access the AABotInsightV3.mez data connector file from C:\Program Files\Automation Anywhere\Enterprise\Connectors\PowerBI and copy it to C:\Users\<your bi="" connector.<="" connectors="" deploy="" desktop\custom="" p="" power="" the="" to="" user&gt;\documents\powerbi=""> <p><a href="#">Deploy Power BI connector</a></p> </your></p>
<p><b>Bot Insight APIs</b></p> <ul style="list-style-type: none"> <li>• All of the parameters are now optional.</li> <li>• The botname parameter in the Get task log data API supports multiple bot names, separated with a comma.</li> <li>• There are no time period limitations now on the data retrieved.</li> </ul> <p><a href="#">Bot Insight API</a></p>

## Enterprise A2019.12 Release Notes

*Release date: 18 May 2020*

Review the new features, supported packages, changed features, fixed features, and known limitations in the Enterprise A2019.12 (Build 4111) release. IQ Bot Build 4088 is compatible with Enterprise A2019.12 Build 4111. There are no security fixes in this release.

- [Enterprise A2019](#)
- [IQ Bot A2019](#)
- [Bot Insight A2019](#)

## Enterprise A2019

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Migration from 11.x and 10.x TaskBots and MetaBots to Enterprise A2019 (currently available only to those in the Migration Early Adopter Program)</b></p> <p>Enterprise A2019</p> <p>Migration to Enterprise A2019 is currently only available to select customers through our Migration Early Adopter Program. If you are interested in learning more about this program and requirements, contact your Automation Anywhere representative.</p> <ul style="list-style-type: none"> <li>• Migrate TaskBots and MetaBots created in 10.x to Enterprise A2019. <a href="#">Migrate Enterprise bots</a></li> <li>• The summary report generated by the Bot Scanner now provides information about the number of bots that can or cannot be migrated to Enterprise A2019. <a href="#">Analyze reports</a></li> <li>• (11.x only) Additional support is provided for packages and variables. <a href="#">Package mapping for migration</a>   <a href="#">Variable mapping for migration</a></li> <li>• (11.x only) Migration APIs enable you to migrate a single 11.x bot or entire folders of bots to Enterprise A2019. Use the Repository Management API to identify bots and folders for migration. <a href="#">Migration APIs</a>   <a href="#">Repository Management APIs</a></li> </ul>
<p><b>Integrate Control Room with a remote Git repository</b></p> <p>Enterprise A2019</p> <p>Integrate the Control Room with remote Git repositories to manage bot version controls, and back up and restore bots and the dependent files. The integration ensures one-to-one mapping of bots between the Control Room and the remote Git file structure. When you perform a bot check-in, a Git commit is performed at the remote Git host.</p> <p><a href="#">Integrating Control Room with Git repositories</a></p>
<p><b>Additional actions in the Interactive forms package</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Interactive forms package includes the following actions:</p> <ul style="list-style-type: none"> <li>• <b>Set focus:</b> Sets the focus on the selected form element.</li> <li>• <b>Highlight:</b> Highlights the selected element of a form.</li> <li>• <b>Unhighlight:</b> Removes the highlight from the selected element of a form.</li> </ul> <p><a href="#">Interactive forms package</a></p>

<p><b>New features</b></p> <p><b>Form builder enhancements for interactive forms</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The form builder includes the following elements:</p> <ul style="list-style-type: none"> <li>• <b>Document:</b> Use this element to render an image (.jpg) or PDF file along with the form.</li> <li>• <b>Password:</b> Use this element for a field that requires masking of the input data.</li> </ul> <p><a href="#">Create a form</a></p>
<p><b>Run Task Bot option for attended Bot Runner</b> (Service Cloud case ID: 00453797)</p> <p>Enterprise A2019 and Community Edition</p> <p>If the default device is mapped to the Bot agent, a user with an attended Bot Runner license in the Control Room can now use the <b>Run Task Bot</b> option from the bot context menu (vertical ellipsis) to run the bot.</p> <p><a href="#">Considerations for running a bot</a></p>
<p><b>New features in Universal Recorder and actions that use the recorder feature</b></p> <p>Enterprise A2019 and Community Edition</p> <ul style="list-style-type: none"> <li>• Secure recording mode ensures that sensitive data is not stored in the bots. When secure recording mode is enabled, the bots do not capture application images or values.</li> </ul> <p>Actions in the Image Recognition, Mouse, OCR, Screen, and Recorder packages support this feature.</p> <ul style="list-style-type: none"> <li>• JRE 6 is supported on both 32-bit and 64-bit systems.</li> <li>• After you capture an object, you are returned to the window containing the Bot editor.</li> </ul> <p>Actions in the Image Recognition, Mouse, OCR, Screen, and Recorder packages support this feature.</p> <p><a href="#">Recording tasks in applications that run on JRE</a>   <a href="#">Secure recording mode</a></p>
<p><b>Insert a work item action</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Insert work item action provides you the flexibility to insert a work item from an existing queue to another queue as part of the bot execution. You can orchestrate multiple bots, enabling optimal device utilization through the queueing mechanism of workload management.</p> <p><a href="#">Workload package</a></p>
<p><b>View error details of a work item</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can view the reason for a workload automation failure in the new <b>Error</b> section on the <b>View work item</b> details page.</p> <p><a href="#">View work items</a></p>

New features
<p><b>Extract text from windows</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Capture text of window</b> action to extract text from a window and save it to a string variable. You can capture text from UNIX shells and Windows applications.</p> <p><a href="#">App Integration package</a></p>
<p><b>Store string values securely in a credential variable</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Configure a credential variable to hold a user-provided value or a credential from the Credential Vault. A credential variable cannot be converted to another data type, and the value cannot be displayed in a message box or written to a file.</p> <p><a href="#">User-defined variables: Credential</a></p>
<p><b>Preload packages for improved bot performance</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Preload packages on your local device to shorten the bot runtime. When you preload packages used in a bot, the system skips the package download process at bot runtime, thereby improving the bot performance.</p> <p><a href="#">Preload packages</a></p>
<p><b>New features in the If and Loop packages</b></p> <p>Enterprise A2019 and Community Edition</p> <ul style="list-style-type: none"> <li>Execute actions based on whether the value of the source datetime variable is <b>Equal to</b> or <b>Not Equal to</b>, or is <b>Greater than</b> or <b>Equal to</b>, or is <b>Lesser than</b> or <b>Equal to</b> the value of the target datetime variable.</li> <li>Execute actions on migrated bots based on whether <b>Web control</b> exists or is active.</li> <li>Configure a <b>Loop</b> action with multiple conditions. <ul style="list-style-type: none"> <li>Specify whether all or either of the conditions must be met.</li> </ul> </li> </ul> <p><a href="#">If package</a>   <a href="#">Loop package</a></p>
<p><b>Run a bot by inserting a file variable in the Run action</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The <b>Task Bot &gt; Run</b> action now supports a file variable input in the <b>Task Bot to run</b> field.</p>
<p><b>Configure a table variable using the Assign action in Data Table package</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can use this action to manually enter values, assign column names, specify the column data type (string, number, datetime, or Boolean), and move columns and rows.</p> <p><a href="#">Data Table package</a></p>

New features
<p><b>Configure Wait package actions to terminate a running bot if a condition is unsatisfied</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Select the <b>Throw an exception</b> option in the Wait for screen change and Wait for window actions to show an error message and terminate a bot if the screen does not change or the window does not open or close within the specified amount of time.</p> <p><a href="#">Using Wait for screen change action</a>   <a href="#">Using Wait for window action</a></p>
<p><b>Email trigger for new emails</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use email triggers to start a bot when a new email message is received in the specified email service. Supported email services are:</p> <ul style="list-style-type: none"> <li>• Microsoft Outlook</li> <li>• Email Server</li> <li>• EWS Server</li> </ul> <p><a href="#">Add an email trigger</a></p>
<p><b>Generate a random integer from a user-specified range and assign it to a number variable</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Random</b> action from the Number package to generate an integer in the range of -9,223,372,036,854,775,808 through 9,223,372,036,854,775,807.</p> <p><a href="#">Random number action</a></p>
<p><b>Enterprise A2019 Bot agent OS support</b></p> <p>Enterprise A2019</p> <p>Enterprise A2019 Bot agent is now supported for single users on Windows Server 2019, Windows Server 2016, Windows Server 2012, Windows 8, and Windows 7 SP1.</p> <p><a href="#">Bot agent compatibility</a></p>
<p><b>Return the Bot agent installation path using the system variable AAIInstallationPath</b></p> <p>Enterprise A2019 and Community Edition</p>
<p><b>Copy and paste actions and triggers between bots</b> (Service Cloud case ID: 00455116)</p> <p>Enterprise A2019 and Community Edition</p> <p>Use the <b>Copy to shared clipboard</b> and <b>Paste from shared clipboard</b> icons at the top of the Bot editor to duplicate actions, triggers, and metadata at a time.</p>

New features
<p><b>GDPR self-reporting</b></p> <p>Enterprise A2019 and Community Edition</p> <p>General Data Protection Regulation self-reporting enables the Control Room administrator to run reports that include the following data elements (sensitive data will be masked in the output):</p> <ul style="list-style-type: none"> <li>• User Bot Runner device access.</li> <li>• User data in associated credential vault.</li> <li>• Devices registered by the user.</li> <li>• All documents (artifacts) uploaded or updated to public or private repositories by the user.</li> <li>• All bots associated to the user.</li> <li>• Bot Insight dashboard report includes a list of all dashboards associated to this user ID.</li> </ul>

Supported packages	
Package	Version
Node Manager	6.5.4738
Application	2.0.0-20200418-005328
App Integration	1.0.0-20200418-005326
Analyze	2.2.1-20200314-193039
Boolean	2.0.0-20200418-005329
Bot Migration	2.3.0-20200424-015945
Browser	2.0.0-20200418-005330
Clipboard	2.0.0-20200418-005342
Comment	2.0.0-20200418-005342
CSV/TXT	2.0.0-20200418-005342
Database	2.0.0-20200418-005345
Data Table	2.0.0-20200418-005637
Datetime	2.0.0-20200418-005348
Delay	2.1.0-20200418-005348
Dictionary	2.0.0-20200418-005349
Run DLL	2.0.0-20200418-005620
Email	2.0.0-20200418-005352
Error handler	2.0.0-20200418-005357
Excel basic	2.0.0-20200422-000204
Excel advanced	2.0.0-20200422-000103
File	2.0.0-20200418-005358
File & folders	2.0.0-20200317-030352
Folder	2.0.0-20200418-005400

Supported packages	
Package	Version
FTP / SFTP	2.0.0-20200418-005404
IF/ELSE	2.0.0-20200418-005406
Image Recognition	2.0.0-20200420-104210
Interactive forms	2.12.0-20200420-084203
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20200418-005413
Simulate keystrokes	2.0.0-20200418-005415
Legacy Automation	1.0.0-20200422-075546 1.0.0-20200422-075549
List	2.0.0-20200418-005422
Log To File	2.0.0-20200418-005423
Loop	2.0.0-20200418-005424
Message Box	2.0.0-20200418-005424
Mouse	2.0.0-20200418-005428
Number	2.0.0-20200418-005433
OCR	2.1.0-20200418-005434
Office 365 Excel	2.0.0-20200418-005517
Office 365 Calendar	2.0.0-20200418-005338
Office 365 OneDrive	2.0.0-20200418-005523
PDF	2.1.0-20200418-005526
PGP	2.1.0-20200418-005528
Ping	2.0.0-20200418-005529
Printer	2.0.0-20200418-005535
Play Sound	2.0.0-20200418-005530
Prompt	2.0.0-20200418-005536
Python Script	2.0.0-20200418-005537
Recorder	2.0.0-20200318-020414
REST Web Service	2.0.0-20200418-005619
SAP	2.1.0-20200418-005622
Screen	2.0.0-20200418-005625
SNMP	2.0.0-20200418-005627
SOAP Web Service	3.0.0-20200418-005630
String	3.0.0-20200418-005635

Supported packages	
Package	Version
System	2.0.0-20200418-005636
Task	2.0.0-20200417.230104-1256
Terminal Emulator	2.0.0-20200418-005641
Trigger Email	1.1.0-20200418-005652
VBScript	2.0.0-20200418-005643
Wait	3.0.0-20200418-005645
Window	2.0.0-20200418-005700
Workload	2.0.0-20200422-054201
XML	2.0.0-20200418-005650

Changed features
<p><b>Build 4105 replaced with Build 4111</b></p> <p>Build 4105 has been deprecated and replaced with Build 4111. If you have installed Build 4105 on Windows, perform a regular upgrade to get the new build. If you have installed Build 4105 on Linux, you must uninstall it and reinstall Build 4111. After you are on Build 4111, an update to Bot agent 7.0.4789 is also required.</p> <p><a href="#">Update to latest Automation 360 version</a></p>
<p><b>User interface changes in Excel basic and Excel advanced packages</b></p> <p>The text field titled <b>Cell name</b> is now <b>Cell address</b> in the actions from the Excel basic and Excel advanced packages.</p>
<p><b>Specify the column title in the Get cell address action in the Excel advanced package</b></p> <p>The <b>Specific cell</b> option is now the <b>Based on header</b> option, which accepts the column title as either the column heading or the default column title.</p> <p><a href="#">Using the Get cell address action</a></p>
<p><b>Edit a work item without changing its status</b></p> <p>You no longer have to change the status of a new work item for editing. You can now edit work items that are in <b>New</b> status. Previously, you were allowed to edit the work item attribute values after changing the state of the attributes so that the edits to the work item could be saved.</p> <p><a href="#">Edit work items</a></p>
<p><b>Mark work items for reprocessing</b></p> <p>The <b>Ready to run</b> action is now updated to <b>Re-process</b> so that you can mark work items that are in <b>Failed</b>, <b>Data error</b>, or <b>On hold</b> state to <b>New</b> status for reprocessing.</p> <p><a href="#">View work items</a>   <a href="#">Edit queues</a></p>

Fixed features	
Service Cloud case ID	Description
00560339	You can now do a second checkout of the same bot, make updates (for example delete a command) , and check it back in. The "File Not Found" error that prevented subsequent checkouts of the same bot and data deletion not actually getting deleted has been fixed.
--	Devices running an older version of the Bot agent can now connect to A2019.12 Control Room.
--	Secure Data Store (SDS) installation on Enterprise A2019.12 is now working.
00530388	Multiple bot updates and check-ins succeed irrespective of the Enterprise A2019 version used to import the bot.  Bot check-in on Cloud deployments used to fail when the bot was imported multiple times and overwritten. This issue is now fixed.
00521691	After Excel files are extracted from a .zip file, common tasks such as renaming and deleting the Excel files failed. This issue is now fixed.
00519528	Bot Scanner version 2.0.0 now works as expected. The crash issue is now fixed.
00517040	When the Email package is used in Exchange Web Services, the action loop exited after processing 10 emails. This early exit is fixed. Now all specified emails are processed before the loop exits.
00504163	When bots are run using the <b>Open</b> and <b>Close</b> actions from the <b>DLL</b> package in a loop, the Bot agent window now functions correctly. The Bot agent service does not require a manual restart after a bot is run.
00494267	Actions from the <b>DLL</b> package can now be run inside and outside a loop.
00494273	The <b>Create worksheet</b> action in the Excel advanced package now supports default sheet names for all the supported languages in Enterprise A2019.
00492554	The <b>Sort table</b> action in the Excel advanced package now supports OS setting for the Swedish region.
00446956	The <b>Open</b> action in the CSV/TXT package can now read values from files encoded with UTF-8.
00503230	The SOAP Web Service action now supports responses with non-English characters.
00522147	The \$StringVar.String:trim\$ shorthand now trims leading and trailing spaces in a string when used in the <b>Message box</b> package.

Fixed features	
Service Cloud case ID	Description
--	You can now deploy bots on selected Bot Runner devices with the <b>Run as</b> option from the <b>My bots</b> page in an Control Room configured on Microsoft Azure.
--	Scheduled bots now run as expected and do not get stuck in the queue in an Control Room configured on Microsoft Azure.
--	<p>After you capture an object in a browser or application window, the browser window containing the Bot editor is now reactivated. Previously, users had to manually return to the Bot editor.</p> <p>Actions in the Image Recognition, Mouse, OCR, Screen, and Recorder packages support this feature.</p>
00475070	Exporting a report to CSV from <b>Activity &gt; Historical</b> now correctly outputs the data.
00516331	You can now build a bot that contains more than one <b>Database &gt; Read from</b> action that is followed by a <b>Loop</b> action, within the same database session. Each time the bot runs the <b>Read from</b> action, the query results are refreshed, and the loop will only iterate on the current results.
00509735	Auto Login now works when you deploy a bot as an unattended Bot Runner on a Horizon Virtual Desktop Infrastructure (VDI) session.
00509831	Prompt package actions now support long inputs. The user interface displays up to 512 characters. If the input is longer than 512 characters, the rest appear as a tooltip when the user hovers over the prompt box.
00518566	You can now use the recorder feature within actions to select window titles and file paths on a device that has proxy authentication enabled. Previously, users had to manually enter this information because they could not access the device through actions while building a bot.
00475107	The Japanese language now supports column names when using CSV-related actions.
00532894 00532253 00539241	When you reimport a bot using exported files from a different Control Room of the same version (from version A2019.12 onward) and choose to overwrite the bot, you can now check-in that bot. The error generated when you choose the overwrite option that prevented check-in of the reimported bot is now fixed only for version A2019.12 onward. Reimporting bots on A2019.11 and older releases are not supported at this time.
00521222, 00525635, 00529274, 00526613, 00526489, 00530609, 00530787, 00533445, 00535366, 00530900, 00538070	The progress of a TaskBot is not stalled at line 0 and does not remain in queue to run when you deploy the bot on a Bot Runner. The status of the device reflects <i>Yet to Be Determined</i> until the device is available to process the items.

Fixed features	
Service Cloud case ID	Description
00421195	You can now create a work queue by providing details such as the queue name, queue owners, participants, consumers, and work item structure. This feature is available from <b>Workload &gt; Queues &gt; Create Queue</b> .
00533465	When you delete any action from an existing bot, the corresponding metadata for the deleted action is now removed from the bot.

Known limitations
If you are running A2019.12 Enterprise On-Premises with build 4105 on Linux and want to use Build 4111, then you must uninstall Build 4105 and do a fresh installation of Build 4111. You cannot perform an upgrade to get Build 4111. See <a href="#">Uninstall Automation 360 On-Premises from Linux server</a> . A2019.12 Enterprise On-Premises on Windows can be upgraded as normal.
The <b>Send reset password email</b> functionality (from the <b>Administration &gt; User</b> page) to help users reset their password is not working and returns a 401 error. Users should use the "Forgot password?" flow to reset their password.
Folders created using the <b>Folder &gt; Create</b> action cannot have names that contain system actions or device references such as AUX, CON, LPT, NUL, and PRN.
Mouse click with key combo for preset triggers in SAP application is currently not supported.
The following are known limitations in the form builder: <ul style="list-style-type: none"> <li>• If the character limit is set to 0 and the field is marked necessary for the <b>Password</b> element in a form, an error message is displayed when you run the bot.</li> <li>• An invalid file path associated with the <b>Document</b> element in a form displays an error message when the <b>Get</b> and <b>Set</b> actions of the interactive forms are used.</li> <li>• A blank page is displayed on the form builder when you paste content into any of the existing form elements.</li> <li>• A form that is linked to a bot through the <b>Display</b> action of interactive forms is displayed in front of all other windows, even when the <b>Always display form window in front</b> option is not selected.</li> </ul>
Cloud-enabled deployments only support local authentication.
Linux is not supported for Cloud-enabled On-Premises installations.
<ul style="list-style-type: none"> <li>• Work items might be queued on the <b>View queues</b> page as the number of devices in the device pool increase. This should not affect the bot execution because the queues are cleared when the work items are processed.</li> <li>• You cannot simultaneously insert work items from multiple devices in a queue.</li> <li>• You cannot create a draft queue.</li> <li>• When you insert a number value using the <b>Insert work item</b> to a queue, the system shows an incorrect value. For example, if you insert 023456789, the system shows 2.3456789E7.</li> <li>• When you add more devices to a device pool that is processing WLM automations, the newly added devices might not immediately pick up the pending work items.</li> </ul> <p><b>Workaround:</b> Pause and resume the WLM automation.</p>

Known limitations
If a device goes idle while processing workload management work items in a device pool, it will not process the work items. However, those work items can be processed by other devices in the pool.
When you create a form with using the <b>Document</b> element and provide an incomplete file path, your bot will not run successfully.
When you create a form and specify that a password is required, the password length can be set to 0.

## IQ Bot (Build 4088)

Enterprise A2019.12 Build 4111 is compatible with IQ Bot A2019 (Build 4088).

The IQ Bot On-Premises version supports all the features and functionality available in IQ Bot Version 6.5.2.

### [IQ Bot feature comparison matrix](#)

Review the compatibility of the IQ Bot On-Premises version with the corresponding Automation Anywhere Control Room On-Premises version.

### [Automation 360 IQ Bot version compatibility](#)

The IQ Bot Cloud version is available for this release and supports all features and functionality available in IQ Bot Version 6.5.2. This version provides users with automatic provisioning for up to three environments such as Development, Test, and Production. Users can migrate learning instances between environments using APIs.

The IQ Bot Community Edition and the free trial version are available for this release. Both versions have feature parity and are based on IQ Bot Version 6.5.2.

Known limitations
IQ Bot On-Premises IQ Bot registration is not supported for Cloud-enabled On-Premises installations.

## Bot Insight

New features
<p><b>View filtered data of the dashboard widgets</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Bot Insight dashboard widget filter enables you to apply filters across the widgets in the dashboard to display filtered data. While the dashboard filters enable you to view different combinations of information from a single dashboard, the widget filters enable you to drill down to information from the already filtered data. You can also save and publish the custom dashboards with the preset widget filters.</p> <p><a href="#">Bot Insight dashboard filter</a></p>

New features
<p><b>Retrieve information from the Bot Insight API, and generate and visualize data analytics on Microsoft Power BI</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The Automation Anywhere custom connector enables you to establish a secure connection to Microsoft Power BI, and generate and visualize data analytics. You can select the Bot Insight APIs in Microsoft Power BI and apply specific parameters for each of the APIs. The custom connector transforms the Bot Insight API responses to data model visualizations in Microsoft Power BI.</p> <p><a href="#">Data connector for Power BI</a></p>
<p><b>Preview and analyze business information in the default business dashboard</b></p> <p>Enterprise A2019 and Community Edition</p> <p>The <b>Data Preview</b> menu in the Bot Insight default business dashboard displays information that is logged for multiple <b>Analyze Open</b> and <b>Close</b> commands used in the bot. The <b>Preview Data</b> menu does not appear when you perform a comparison between the default dashboards.</p>
<p><b>API enhancements</b></p> <p>Enterprise A2019</p> <p>The <code>deletetasklogdata</code> API is updated to include the <code>runid</code> parameter. The <code>getbotrundata</code> API retrieves information about the vital statistics of the bot. The <code>getaudittraildata</code> API retrieves information about the audit data that is logged for all users.</p> <p><a href="#">Bot Insight API</a></p>

### Related concepts

#### [Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

### Related tasks

#### [Update to latest Automation 360 version](#)

If you are already using Automation 360 On-Premises, you can update to the latest version of Automation 360.

#### [Updating Automation 360 IQ Bot](#)

Update Automation 360 IQ Bot On-Premises to the most recent version for all the latest features and enhancements.

## Enterprise A2019.11 Release Notes

Review the new features, supported packages, changed features, fixed features, and known limitations in the Enterprise A2019.11 (Build 3337) release. There are no security fixes in this release.

- [Enterprise A2019](#)
- [IQ Bot](#)
- [Bot Insight](#)

## Enterprise A2019

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Migrate 11.x TaskBots and MetaBots to Enterprise A2019</b></p> <p>Enterprise A2019</p> <ul style="list-style-type: none"> <li>Additional support is provided for packages and variables.           <ul style="list-style-type: none"> <li><a href="#">Package mapping for migration</a>   <a href="#">Variable mapping for migration</a></li> </ul> </li> <li>You can now migrate MetaBots (with DLLs) and their components from 11.x to Enterprise A2019. You cannot migrate screen-based MetaBots.           <ul style="list-style-type: none"> <li><a href="#">How MetaBots are migrated</a></li> </ul> </li> <li>Use the Bot Scanner to analyze MetaBots to determine if they can be migrated.</li> <li>Verify the list of certified 11.x bot versions available for migration: <a href="#">Supported versions for migration</a></li> </ul>
<p><b>Bot Store integration with the Control Room</b></p> <p>Enterprise A2019</p> <p>You can now access the Bot Store from within the Control Room. You can install, configure, and run the Bot Store bots within the Control Room.</p> <p>As a registered user, you can log in to the Bot Store from the Control Room and access all your downloads. You can install bots and packages from your downloads to the Control Room private repository. You can also submit your existing bots and packages from the Control Room to the Bot Store.</p> <p><a href="#">Bot Store</a></p>
<p><b>Use interactive forms in a bot</b></p> <p>Enterprise A2019</p> <p>Interactive forms provide a form builder experience for users to build interfaces for submitting and regrouping data being used to send and receive data from various applications within their attended automation process. Users with Bot Creator and Bot Runner license can use the interactive forms package to control and manage the form flow within a bot during runtime. Actions performed by users on the interactive forms can be monitored to execute logic using subtasks.</p> <p>Interactive forms are first-class citizens within the bot repository and have the same workflows for moving forms between public and private workspaces, and for export or import actions. No additional licenses or permission are required to use interactive forms.</p> <p>Action items in the interactive forms can be used to manage various forms within a bot.</p> <p><a href="#">Using interactive forms</a></p>

## New features

### Reuse an identical value between bots by configuring a global value in the Control Room

Enterprise A2019 and Community Edition

A global value enables users to reuse an identical value between bots instead of creating a new variable for each bot. Global values remain constant for all users and bots in an Control Room instance. A user with the `AAE_admin` role can configure a global value with a default value and enable non-admin users to overwrite the value to use in their bots.

[Global values](#) | [Create a global value](#) | [Overwrite the default value](#)

## Workload enhancements

Enterprise A2019 and Community Edition

- Monitor the progress of ongoing workload automations. You can also pause, resume, or stop the automations as required.
- Configure and edit workload automations to ensure that the automations are deployed seamlessly to unattended Bot Runner devices. Execute the workload automations with priority or round-robin mode from the **Devices** > **Edit Device pool** page.
- Set the output status of the work item processed in the Control Room on the **Queues** and **Work item** details page using the `$workItemResult$` variable in a TaskBot.
- Edit work items that are in **Ready to run**, **On hold**, **Data error**, or **Failed** state.
- Set the individual work item status to **Mark complete**, **Defer**, or **Re-process** from the **Edit work item** page or in bulk from the **View queues** page.

[View automation of a queue](#) | [Edit device pools](#) | [Edit work items](#) | [Use Work Item variables](#)

## Download a file from the Control Room to your device

Enterprise A2019 and Community Edition

Use the **Download CR file** action from the File package to download a file from the Control Room to your device.

**Note:** You cannot use this action to download a bot or a file from the `My Scripts` folder.

[File package](#)

## Clone a bot or files

Enterprise A2019 and Community Edition

Create a read-only copy of a selected bot or file from the public repository to the private repository. The clone is a local copy for the same user and will not be updated with the public repository copy automatically. This provides a testing environment experience for Bot Creators to make and validate changes locally and take advantage of reusable TaskBots in concurrent developments by reusing an existing bot or file as a dependency.

- Cloned bots and files cannot be edited, renamed, or moved.
- Cloned bots and files can be deleted from a private repository.
- Users can create a copy of the cloned bot.
- A cloned bot can be used in Run Task action in another bot.
- Cloned bots and files can be added as a manual dependency for another bot.

## New features

### New features in the If package

Enterprise A2019 and Community Edition

- Configure an **If** action with multiple conditions.  
Specify whether all or either of the conditions must be met.
- Verify whether JavaScript, Task, or VBScript ran successfully or not.
- Verify whether a string variable is empty or not.
- Execute actions only if two strings have matching uppercase and lowercase letters.

[If package](#) | [Example of using a conditional statement](#)

### Universal Recorder enhancements

Enterprise A2019 and Community Edition

Universal Recorder now enables you to:

- Automate in Java applications that run using Java Runtime Environment (JRE) 9, 10, and 11.
- Capture objects in tables in Oracle EBS applications.
- Automate interactions with user interface objects in the taskbar, desktop, or currently active window. This option is available in the window selection drop-down list in the following packages:
  - Image Recognition
  - Mouse
  - Recorder
  - Screen
  - Simulate keystrokes
  - Window

[Universal Recorder for object-based automation](#)

### New features in the Excel advanced package

Enterprise A2019 and Community Edition

- In the **Replace** action, you can choose to replace cell values with an empty character.
- In the **Get cell address** action, you can choose to save the retrieved cell address to a string variable.

[Using the Replace action](#) | [Using the Get cell address action](#)

### Add DLL dependencies

Enterprise A2019 and Community Edition

As a bot creator, you can use a DLL that refers to a child DLL.

[Bot dependencies](#)

### Licensing server failover

Enterprise A2019

HA failover from a primary cluster to a secondary cluster applies to all the servers, including the licensing server, and is handled by the data center high availability tools.

[Distributed architecture with HA/DR support](#) | [High availability cluster configuration](#)

New features
<p><b>Automate locking, logging off, restarting, or shutting down the computer</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use actions from the System package at the end of tasks to automate locking, logging off, restarting, or shutting down the computer.</p>
<p><b>Manage running bots with the Pause and Stop actions from the Task Bot package</b></p> <p>Enterprise A2019 and Community Edition</p> <ul style="list-style-type: none"> <li>• Insert a <b>Pause</b> action to temporarily pause the running bot.</li> <li>• Insert a <b>Stop</b> action to terminate the running bot.</li> </ul> <p><a href="#">Task Bot package</a></p>
<p><b>Automate printer settings</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Use actions from the Printer package to automate retrieving and setting the default printer.</p>
<p><b>Return the path and name of the currently running TaskBot using the system variable AATaskName</b></p> <p>Enterprise A2019 and Community Edition</p> <p><a href="#">Predefined variables</a></p>
<p><b>Run JavaScript, Python, or VBScript from a file selected from your desktop</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can select the file containing the script as part of configuring the action.</p> <hr/> <p><b>Note:</b> The file and any dependencies must be in a standalone folder. When you select a file for upload, all files and folders at the same folder level are uploaded.</p> <hr/> <p><a href="#">JavaScript package</a>   <a href="#">Python Script package</a>   <a href="#">VBScript package</a></p>
<p><b>Device optimization for bot deployment</b> (Zendesk ID: 238675)</p> <p>Enterprise A2019 and Community Edition</p> <p>Bot Runner devices that are used for Workload automation are now available for deployment in the <b>Scheduled Automations</b> page. This ensures that idle devices during a workload cycle are available to the user with scheduling rights for Control Room deployment.</p> <p><a href="#">Edit device pools</a></p>

## Supported packages

Package	Version
Node Manager	6.0.4015
Application	2.0.0-20200302-135910
Analyze	2.2.1-20200314-193039

Package	Version
Boolean	2.0.0-20200302-135912
Browser	2.0.0-20200302-135913
Clipboard	2.0.0-20200302-135922
Comment	2.0.0-20200302-135922
CSV/TXT	2.0.0-20200312-122802
Database	2.0.0-20200302-135926
Data Table	2.0.0-20200302-140308
Datetime	2.0.0-20200302-135930
Delay	2.1.0-20200302-135931
Dictionary	2.0.0-20200302-135932
Run DLL	2.0.0-20200313-170350
Email	2.0.0-20200302-135934
Error handler	2.0.0-20200302-135940
Excel basic	2.0.0-20200302-140133
Excel advanced	2.0.0-20200302-140020
File	2.0.0-20200316-045955
File & folders	2.0.0-20200317-030352
Folder	2.0.0-20200302-135945
FTP / SFTP	2.0.0-20200302-135948
IF/ELSE	2.0.0-20200302-135950
Image Recognition	2.0.0-20200302-135953
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20200313-170107
Simulate keystrokes	2.0.0-20200313-170111
Legacy Automation	1.0.0-20200317-220124 1.0.0-20200317-220128
List	2.0.0-20200302-140013
Log To File	2.0.0-20200302-140014
Loop	2.0.0-20200302-140015
Message Box	2.0.0-20200302-140016
Migration	2.0.0-20200317-220133
Mouse	2.0.0-20200302-140016
Number	2.0.0-20200302-140023
OCR	2.1.0-20200302-140025

Package	Version
Office 365 Excel	2.0.0-20200309-140138
Office 365 Calendar	2.0.0-20200305-124125
Office 365 OneDrive	2.0.0-20200309-110128
PDF	2.1.0-20200302-140126
PGP	2.1.0-20200309-110135
Ping	2.0.0-20200302-140130
Printer	2.0.0-20200311-100204
Play Sound	2.0.0-20200309-110137
Prompt	2.0.0-20200302-140148
Python Script	2.0.0-20200313-170254
Recorder	2.0.0-20200318-020414
REST Web Service	2.0.0-20200312-090358
SAP	2.1.0-20200302-140250
Screen	2.0.0-20200302-140254
SNMP	2.0.0-20200302-140257
SOAP Web Service	2.0.0-20200312-110311
String	2.0.0-20200302-140306
System	2.0.0-20200309-140321
Task	2.0.0-20200317-030340
Terminal Emulator	2.0.0-20200302-140313
VBScript	2.0.0-20200313-170417
Wait	2.0.0-20200302-140319
Window	2.0.0-20200302-140348
XML	2.0.0-20200302-140321

#### Changed features

##### Change in the Dictionary > Remove action

The **Dictionary > Remove** action offers the option to assign the removed value to a variable.

[Dictionary package](#)

The **Update migration status** permission name has been changed to **Allow a bot-runner user to run migrations**. All functionalities remain the same.

Changed features
<p>When multiple bots are scheduled to run on the same user or device, the bots are now queued and run whenever the previous bots completes its run.</p> <p>Service Cloud case ID: 00440072</p> <p><a href="#">Schedule</a>   <a href="#">Workload management</a></p>

## Fixed features

Service Cloud case ID	Description
00483976	When the copy function is used, nested subfolders were not visible when users clicked browse to search through directories. This issue has been fixed.
00457550	When a user checks out a bot that uses the <b>Run</b> action to run child bots, the child bots are now cloned from the public repository to the private.
00492706	When a user exports a bot from another Control Room and imports that same bot to a new Control Room, the imported bot and enabled packages now show all required actions.
00482934	Bot deployments and website launches are now optimized for quicker process.
00421864	When a user is viewing historical activity details in <b>Historical activity</b> , the run option is no longer displayed.
00505120	When bots fail the check-in process, the contents are now restored in the <b>Private</b> repository.
00488504	Bots with more than 100 dependencies are now exported successfully without an error, even if the parent bots are in the list of those 100 dependencies.
00444902	When the Control Room is used in Internet Explorer 11, the Bot agent is now compatible and the UI is rendered properly.
00454079	When the <b>Capture</b> action in the Recorder package is used, content in the browser is captured successfully.
00460530	In a developer Control Room, a user can now successfully import a bot with cyclic dependency.
00493605	In the <b>Run</b> action in the TaskBot package, the <b>Assign the output to variable (optional)</b> option now functions properly when an assigned variable is removed.
00486734	When the <b>Set cell</b> action in the Excel advanced or Excel basic package is used with multiple Microsoft Excel files, the values of the <b>Active cell</b> operation now activate and set the cells accordingly in the respective Microsoft Excel file.
00530915	Migration is not advisable for 11.x customers using Workload Management (WLM) due to known issues.

Service Cloud case ID	Description
--	You can now add date variables in the <b>Vertical Bar Graph</b> widget in the Bot Insight <b>Business</b> dashboard.
00475173	All fields of the <b>Recorder &gt; Capture</b> action have been translated to Enterprise A2019 supported languages.
00476820	When a Bot Runner machine is logged off, the device shows the state as Disconnected in the Control Room. Previously, the device showed the state as Connected in the Control Room.

Known limitations
MetaBot logic that uses a DLL function call with one or more parameters migrates successfully. However, when you run the migrated bot, an error is shown.
Global values of the Date time data type cannot be used in actions.
The Enterprise A2019 On-Premises Control Room installation does not support the semicolon (;) special character in the Windows user password. The installation fails if you use this special character.
When data is exported into a CSV file from <b>User Management, Audit Logs, and Roles Management</b> for all locales except English, the respective language is not displayed correctly. Workaround: Export to a CSV file and access a Microsoft Excel file. Import and save that CSV file as a CSV with UTF-8 encoding.
Users must explicitly enable the feature flag for the forms feature in the On-Premises build.
<b>Note:</b> Go to Automation Anywhere support site for more information: <a href="#">Interactive forms not available in Automation 360 v.11 On-Premises (A-People login required)</a>
Forms with many radio buttons and check boxes in the same row are not rendered correctly.
Only the <b>Form Events</b> and <b>UI Triggers</b> event types are supported by event loop as the file or folder triggers and hot keys have issues.

## IQ Bot

The IQ Bot On-Premises version is available for this release with additional features or updates since the last release. This IQ Bot version supports all the features and functionality available in IQ Bot Version 6.5.2.

### [IQ Bot feature comparison matrix](#)

Review the compatibility of the IQ Bot On-Premises version with the corresponding Automation Anywhere Control Room On-Premises version.

### [Automation 360 IQ Bot version compatibility](#)

The IQ Bot Cloud version is available for this release and supports all features and functionality available in IQ Bot Version 6.5.2. This version provides users with automatic provisioning for up to three environments such as Development, Test, and Production. Users can migrate learning instances between environments using APIs.

The IQ Bot Community Edition and the free trial version are available for this release. Both versions have feature parity and are based on IQ Bot Version 6.5.2 .

New features
<p><b>Upgrade from earlier versions of IQ Bot to the latest IQ Bot On-Premises</b></p> <p>IQ Bot On-Premises</p> <p>If you are using any of the earlier versions of IQ Bot (5.3.x or 6.5.x), you can upgrade to IQ Bot A2019 Build 3337 On-Premises.</p> <p><a href="#">Updating Automation 360 IQ Bot</a></p>
<p><b>Use API to migrate learning instances between environments</b></p> <p>You can use an API to migrate learning instances in IQ Bot On-Premises.</p>
<p><b>Access IQ Bot from the Control Room dashboard</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can access IQ Bot from the Control Room through a link, provided you have registered IQ Bot in the Control Room. Otherwise, the IQ Bot section remains hidden.</p>

Known limitations
<p>IQ Bot On-Premises</p> <p>IQ Bot installation fails if the user password contains any of these special characters: single quotation mark ( ' ), quotation mark ( " ), or semicolon ( ; ).</p>
<p>IQ Bot Cloud</p> <ul style="list-style-type: none"> <li>• ABBYY FineReader Engine is the default OCR for data extraction in IQ Bot Cloud.</li> <li>• Data validation using Python script is not supported.</li> <li>• IQ Bot extensions for custom extraction are not available.</li> </ul>

## Bot Insight

New features
<p><b>View filtered data of Bot Insight dashboards</b></p> <p>Enterprise A2019</p> <p>The Bot Insight dashboard filter enables you to apply filters across dashboards to display filtered data on the dashboard widgets. The filter enables you to view different combinations of information from a single dashboard, thereby eliminating the need to maintain separate dashboards for different sets of users.</p> <p><a href="#">Bot Insight dashboard filter</a></p>

**New features****View business analytics for multiple transactions simultaneously**

Enterprise A2019

The **Multiple Transaction Names** menu displays transactional information about bots with multiple **Analyze- Open** and **Close** commands. Each **Analyze- Open** and **Close** command is considered as a transaction, and each transaction is displayed as a unique block in the data preview section. The number of rows for each unique transaction block is limited to 100.

[Business dashboard](#)

## Enterprise A2019.10 Release Notes

Review the new features, supported packages, changed features, fixed features, and known limitations in Enterprise A2019.10 (Build 2545). There are no security fixes in this release.

- [Enterprise A2019](#)
- [IQ Bot](#)
- [Bot Insight](#)

### Enterprise A2019

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

**New features****Migrate 11.3.x TaskBots to Enterprise A2019**

Enterprise A2019

- Analyze whether you can migrate bots created in Enterprise client version 10.x using the Bot Scanner.

[Analyze reports](#)

- Additional support is provided for packages and variables.

[Package mapping for migration](#) | [Variable mapping for migration](#)

- Multiple Bot Runner users are supported for bot migration.

[Migrate Enterprise bots](#)**AISense Recorder to capture objects from remote applications**

This is a **Beta** release on Enterprise A2019 (Cloud deployment only) and Community Edition

Record a task and capture objects using the AISense Recorder from applications that are usually accessed remotely and with a complex user interface (UI).

[Record a task with AISense Recorder](#)

New features
<p><b>Manage your automation as Work Items for resource optimization and workload automation</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Divide your automation into small, logical modules called Work Items using the new <a href="#">Workload Management</a> feature. Process these Work Items simultaneously using queues to ensure that your organization's automation goals are achieved with optimum resource utilization.</p> <p>Use the workload module to create and manage workload queues and run bots on unattended Bot Runners through the workload queues. Also, pass the Work Item attributes or values to the bot from the Control Room when you <b>Run bot with queue</b> with the help of Work Item variables.</p> <p><a href="#">Workload management</a></p>
<p><b>Install Control Room on Red Hat Enterprise Linux 7.7 and Linux CentOS 7.7</b></p> <p>Enterprise A2019</p> <p>Use the command line to install your Control Room on your Linux servers in the datacenter.</p> <p><a href="#">Installing Control Room on Linux</a></p>
<p><b>Use wildcard characters in folder and file path fields in the Encrypt and Decrypt actions</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Substitute an asterisk (*) for one or more unknown alphanumeric characters or symbols. This maximizes the search results by returning all folders and files that contain the string that you have specified.</p> <p><a href="#">Encrypt</a>   <a href="#">Decrypt</a></p>
<p><b>Use system variables to return data from the computer that is connected to the running Bot agent</b></p> <p>Enterprise A2019 and Community Edition</p> <p>You can use the following system variables:</p> <ul style="list-style-type: none"><li>• <b>AAControlRoom</b>: Returns the URL of the Control Room.</li><li>• <b>CPUUsage</b>: Returns the percentage utilization of the CPU.</li><li>• <b>RAMUsage</b>: Returns the RAM usage in megabytes.</li><li>• <b>OSName</b>: Returns the operating system.</li><li>• <b>TotalRAM</b>: Returns the total amount of RAM available.</li></ul>

New features
<p><b>Automate tasks in Oracle EBS and Forms with the Universal Recorder</b></p> <p>Enterprise A2019 and Community Edition</p> <p>Open Oracle EBS applications in a browser as Java Web Start applications or as a thick client. The Universal Recorder can capture the following objects:</p> <ul style="list-style-type: none"> <li>• Window/Tab</li> <li>• Button</li> <li>• Text box</li> <li>• Label (read-only)</li> <li>• Radio button</li> <li>• Check box</li> <li>• Table/Grid</li> <li>• Scroll bar</li> <li>• Menu</li> <li>• Combo-box/Drop-down list</li> </ul>

## Supported packages

Package	Version
Node Manager	2.0.2885
Application	2.0.0-20200131-085947
Analyze	2.1.0-20200204-154550
Boolean	2.0.0-20200131-085949
Browser	2.0.0-20200127-180439
Clipboard	2.0.0-20200131-085958
Comment	2.0.0-20200130-183435
CSV/TXT	2.0.0-20200205-175938
Database	2.0.0-20200205-175940
Data Table	2.0.0-20200131-200235
Datetime	2.0.0-20200131-090006
Delay	2.1.0-20200131-090007
Dictionary	2.0.0-20200205-175946
Run DLL	2.0.0-20200205-230300
Email	2.0.0-20200206-135926
Error handler	2.0.0-20200130-183452
Excel basic	2.0.0-20200205-110122
Excel advanced	2.0.0-20200205-110012
File	2.0.0-20200131-090018

Package	Version
Folder	2.0.0-20200131-090021
FTP / SFTP	2.0.0-20200206-110020
IF/ELSE	2.0.0-20200131-090025
Image Recognition	2.0.0-20200131-090028
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20200205-180013
Simulate keystrokes	2.0.0-20200205-105955
List	2.0.0-20200131-090039
Log To File	2.0.0-20200131-090040
Loop	2.0.0-20200131-090041
Message Box	2.0.0-20200131-090041
Migration	1.1.0-20200206-180601
Mouse	2.0.0-20200131-090044
Number	2.0.0-20200205-110015
OCR	2.1.0-20200131-090053
Office 365 Excel	2.0.0-20200205-180122
Office 365 Calendar	2.0.0-20200206-105949
Office 365 OneDrive	2.0.0-20200127
PDF	2.1.0-20200131-090152
PGP	2.1.0-20200205-110117
Ping	2.0.0-20200131-090156
Play Sound	2.0.0-20200127-180654
Prompt	2.0.0-20200127-180707
Python Script	2.0.0-20200205-180148
Recorder	2.0.0-20200212
REST Web Service	2.0.0-20200206-110309
SAP	2.1.0-20200205-180245
Screen	2.0.0-20200131-090311
SNMP	2.0.0-20200207-090446
SOAP Web Service	2.0.0-20200127-180819
String	2.0.0-20200131-090323
System	2.0.0-20200205-110240
Terminal Emulator	2.0.0-20200131-090330
VBScript	2.0.0-20200205-180309

Package	Version
Wait	2.0.0-20200131-090335
Window	2.0.0-20200131-090337
XML	2.0.0-20200131-090339

Changed features
<p><b>Updated layout for the summary report generated by Bot Scanner</b></p> <p>The layout of the summary report is updated to provide information about the number of bots scanned, and the commands and variables used in the scanned bots that are supported in Enterprise A2019.</p> <p><a href="#">Analyze reports</a></p>
<p><b>Python script and VBScript packages return output without quotation marks</b></p> <p>The actions in the Python script and VBScript packages now return output without any quotation marks. For example, if the action previously returned "ABC" as the output, now the action returns only ABC.</p>
<p><b>Use Microsoft SQL Server address as alias for database</b></p> <p>Service Cloud case ID: 00401484</p> <p>The Control Room now supports using a Microsoft SQL Server address as alias for a database during installation.</p> <p><a href="#">Automation 360: Steps to change database server post Control Room installation (A-People login required)</a></p>

## Fixed features

Service Cloud case ID	Description
00463210	In a virtual machine using Remote Desktop Protocol, the <b>Keystrokes</b> action now functions properly without prompting a special characters error.
00455359, 00466407, 00475122	When the Control Room is used in Google Chrome, renaming a folder in the <b>My bots</b> section no longer causes the browser to crash.
00440659	In the <b>Data Table</b> package, the <b>Create folders/files if it doesn't exist</b> option in the <b>Write to file</b> action now functions properly and does not create a file when the option is not selected.
00377861, 00466104	When you install Enterprise A2019 On-Premises with Amazon Relation Database Service (RDS) and there is no internet connectivity, the installation now completes successfully.
00472738, 00496476	In the Control Room, the bot now runs successfully without prompting an interactive bot error message in any circumstance.

Service Cloud case ID	Description
00472655	In the <b>Loop</b> action, selecting the <b>Cell range</b> in the <b>Loop through</b> option now functions properly with the <b>For each row in worksheet</b> in the <b>Iterator</b> option.
00475040	When a bot is developed in Google Chrome, the pause and resume options now function correctly.
00445671	The time taken to connect to the Control Room is now less than 2 minutes after you restart the Control Room services.
00421864	You can now configure your Bot agent using the Google Chrome browser. The following error message is no longer displayed: <code>Please use Chrome to configure your bot agent.</code>
00462095	Bot compilation time has decreased, so it takes less time for the bot to run. Previously, some bots took up to 40 seconds in pre-processing mode.

## IQ Bot

The IQ Bot On-Premises version is available for this release with additional features or updates since the last release. This IQ Bot version supports all the features and functionality available in IQ Bot Version 6.5.2.

### [IQ Bot feature comparison matrix](#)

Review the compatibility of the IQ Bot A2019 On-Premises version with the corresponding Automation Anywhere Control Room On-Premises version.

### [Automation 360 IQ Bot version compatibility](#)

New features
<p><b>IQ Bot On-Premises unified database</b></p> <p>IQ Bot Build 2545 On-Premises now supports a unified database. You have to run a migration script to migrate the databases of Builds 1089, 1598, and 2079 to Build 2545.</p> <p><a href="#">Run IQ Bot On-Premises database migration script</a></p>

---

**Note:** The version number in the IQ Bot installer is incorrect and will be fixed in the next release.

---

## Bot Insight A2019

New features
<p><b>New Bot Insight homepage</b></p> <p>The new homepage displays all the available dashboards in a single page and enables you to directly access the dashboard of your choice. The smart search functionality enables you to search for dashboards in the <b>Search</b> text field. The homepage also enables you to bookmark your favorite dashboards and to sort the dashboards based on the following parameters:</p> <ul style="list-style-type: none"> <li>• <b>Dashboard Name</b></li> <li>• <b>Type</b></li> <li>• <b>Total Views</b></li> <li>• <b>Last Refreshed</b></li> </ul> <p><a href="#">Bot Insight dashboards</a></p>
<p><b>Operations dashboard</b></p> <p>View information about the bots that are deployed on different Bot Runner machines and their statistics based on the performance from the Bot Insight <b>Operations</b> dashboard. You can use this information to enhance productivity and take measures based on real-time information for RPA deployments.</p> <p>You can directly access the <b>Bots</b> and <b>Audit</b> dashboards from the hyperlinks in the <b>Operations</b> dashboard.</p> <p><a href="#">Operations dashboard</a></p>
<p><b>Transaction data</b></p> <p>View data that is aggregated and logged by the bots when they are deployed in the Bot Runner machines by using the <b>Transaction</b> data feature in the <b>Profile</b> menu. You can access this feature from the <b>Business</b> dashboard.</p> <p><a href="#">Business dashboard</a></p>
<p><b>Exporting data from widgets</b></p> <p>Export data that is generated by the various smart widgets to comma-separated value (CSV) files on your local drive from the <b>Custom Business</b> dashboard. The export file for all the widgets, except the <b>Data Table Chart</b> and the <b>US Map</b>, contains the following headers:</p> <ul style="list-style-type: none"> <li>• Group</li> <li>• Subgroup</li> <li>• Metric</li> <li>• Volume</li> </ul> <p>The <b>Data Table Chart</b> export file contains all the headers that are present in the <b>Data Table Chart</b>. The <b>US Map</b> export file contains the state codes, metric values, and the volume headers.</p> <p><a href="#">Exporting data from a dashboard widget</a></p>

**New features****Visualization updates**

Customize the widgets on the Bot Insight dashboards to gain insights for specific scenarios. The following widgets are added to Bot Insight:

- **Heat Map**
- **Data Table Chart**

[Bot Insight visualizations](#)

## Known limitations

Using the Universal Recorder in Oracle EBS applications:

- The **Select item by text** action does not retrieve the value of a selected **ListView** object.

Workaround: Manually enter the item value after capturing the object control or use the **Select item by index** action.

---

**Note:** Item index count starts at 1.

- At runtime, the **Select item by text** and **Select item by index** actions do not appear to select the item specified in a **PageTab** object, but the bot successfully executes the action.
- At runtime, the **Select item by text** and **Select item by index** actions do not appear to select the item specified in a **ComboBox** object, but the bot successfully executes the action.

In Enterprise A2019 On-Premises, the following activities are currently not logged in the workload logs:

- Create a queue
- Create a device pool
- Create a bot
- Run a bot with a queue

You can access the logs from the `C:\ProgramData\AutomationAnywhere\Logs` folder.

### Related information

<https://www.automationanywhere.com/in/lp/rpa-editions-comparison>

## Enterprise A2019 (Build 2094) Release Notes

These release notes describe new features, changed features, fixed features, security fixes, deprecated features, and known limitations in Enterprise A2019 (Build 2094).

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

### Enterprise A2019 Build 2094

Build 2094 contains updates for the following:

- [Enterprise Community Edition](#)
- [Bot Insight A2019](#)
- [IQ Bot A2019](#)

- *On-Premises* (Build 2079)

## New features in Build 2094

Feature	Description
<b>Migration</b>	<p>Migrate 11.3.x TaskBots to Enterprise A2019.</p> <ul style="list-style-type: none"> <li>• Run the Bot Scanner (previously called the pre-migration utility) to analyze if your 11.x bot (currently only 11.3.1, 11.3.2, and 11.3.2.x versions are supported) can be migrated to Enterprise A2019. The utility generates a summary report in HTML format and a separate report for each bot in XML format.</li> </ul> <p><i><a href="#">Bot Scanner overview</a></i></p> <ul style="list-style-type: none"> <li>• Migrate multiple TaskBots with dependent TaskBots using a single Run-as user.</li> </ul> <p><i><a href="#">Migrate Enterprise bots</a></i></p> <ul style="list-style-type: none"> <li>• As part of the bot migration process, you can identify previously migrated TaskBots on the bot selection page and preview a list of the dependent TaskBots before finalizing the migration.</li> </ul> <p><i><a href="#">Migrate Enterprise bots</a></i></p> <ul style="list-style-type: none"> <li>• Analyze the status of individual bot migrations and identify any unsupported commands or attributes associated with the migrated bot and its dependencies.</li> </ul> <p><i><a href="#">View migration reports</a></i></p> <ul style="list-style-type: none"> <li>• Additional support is provided for packages and variables.</li> </ul> <p><i><a href="#">Package mapping for migration</a></i></p>
<b>SAML 2.0</b>	<p>Switch an authenticated environment Control Room database to a SAML identity provider (IDP).</p> <p><i><a href="#">Set up SAML authentication</a></i></p>

Feature	Description
<b>Bot Deploy API</b>	<p>The Bot Deploy API now includes / <code>automations/deploy</code> and is introduced to support the <code>runAs user</code> feature for Bot deployment.</p> <ul style="list-style-type: none"> <li>The Bot Deploy API works only in Enterprise public accounts, and not in Community Edition.</li> <li>The API supports callback URL for environments that have both the Control Room and callback server on the same network.</li> </ul>
<b>Geo Presence</b>	The Geo Presence feature is a multi-tenant, secure, scalable, Cloud Control Room enhancement to securely communicate with users and Bot Runners over a customer network.
<b>Exchange Web Services support</b>	<p>Actions in the Email package enable users to automate email-related operations using Exchange Web Services (EWS).</p> <p><i>Email package</i></p>
<b>Variables in place of an index or key value</b>	<p>Data table, dictionary, list, and record type variables can express index and key values as variables.</p> <p><i>Variable types</i></p>
<b>Copy bot</b>	<p>The copy bot functionality retains the metadata of the original bot, including captured images, recorded objects, called files, and child bots.</p> <p><i>Copy a bot</i></p>
<b>Excel actions to retrieve cell, column, or row location</b>	<p>The following actions enable users to retrieve location information from an Excel sheet and save it to a variable.</p> <ul style="list-style-type: none"> <li><i>Get cell address</i></li> <li><i>Get column</i></li> <li><i>Get row</i></li> </ul>
<b>Recorder enhancements</b>	Users can discard the most recently captured object while the Recorder is running.

## Supported packages

Package	Version
Node Manager	1.0.1891
Application	2.0.0-20191223-210256

Package	Version
Boolean	2.0.0-20191223-210258
Browser	2.0.0-20191223-210259
Clipboard	2.0.0-20191223-210308
Comment	2.0.0-20191223-210309
CSV/TXT	2.0.0-20191223-210310
Database	2.0.0-20191223-210312
DataTable	2.0.0-20191223-210802
DateTime	2.0.0-20191223-210316
Delay	2.1.0-20191223-210318
Dictionary	2.0.0-20191223-210318
DLL	2.0.0-20191223-210742
Email	2.0.0-20200114-060001
Error Handler	2.0.0-20191223-210326
Excel	2.0.0-20200107-140225
Excel_MS	2.0.0-20200107-140116
File	2.0.0-20200114-060009
Folder	2.0.0-20200114-060012
FTP/SFTP	2.0.0-20191223-210334
If/Else	2.0.0-20191223-210336
IR	2.0.0-20191223-210339
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20191223-210345
Keystrokes	2.0.0-20191223-210348
List	2.0.0-20191223-210350
LogToFile	2.0.0-20191223-210350
Loop	2.0.0-20191223-210352
MessageBox	2.0.0-20191223-210352
Migration	1.1.0-20200111-070201
Mouse	2.0.0-20191223-210355
Number	2.0.0-20191223-210402
OCR	2.1.0-20191223-210525
Office 365 Excel	2.0.0-20191231-170605
Office 365 Calendar	2.0.0-20191231-170422
Office 365 OneDrive	2.0.0-20191231-170612

Package	Version
PDF	2.1.0-20191223-210631
PGP	2.1.0-20191223-190649
Ping	2.0.0-20191223-210634
PlaySound	2.0.0-20191223-210636
Prompt	2.0.0-20191231-130717
Python	2.0.0-20191223-210644
Recorder	2.0.1-20200111-070529
Rest	2.0.0-20191231-120639
SAP	2.1.0-20191223-210745
Screen	2.0.0-20191223-210748
SNMP	2.0.0-20191223-210752
SOAP	2.0.0-20191210-081952
String	2.0.0-20200114-110316
System	2.0.0-20191223-210800
Terminal Emulator	2.0.0-20191223-210806
VBScript	2.0.0-20191223-210809
Wait	2.0.0-20191223-210812
Window	2.0.0-20191223-210814
XML	2.0.0-20191223-210815

## Changed features

Feature	Description
Office 365 packages authorization	<p>Authorize each Office 365 package separately through the <b>Connect</b> package in each package.</p> <p><i>Using the <a href="#">Connect action</a></i></p>

## Fixed features

Feature	Description
Bot agent	<p>In the Control Room, upgrading to the latest Bot agent version now successfully executes the bot without any prompted error messages. See <i><a href="#">Switch Bot agent to a different Control Room.</a></i></p>

Feature	Description
Excel advanced package	In the <b>Excel advanced</b> package, the <b>Close</b> action now terminates only a specific open session as defined by the <b>session name</b> .
Keystrokes	The <b>Keystrokes</b> command now functions properly with the Japanese keyboard layout.

## Security fixes

The security fixes in this release have not changed since the previous release. For a list of these fixes, see [Enterprise A2019 \(Builds 1598 and 1610\) Release Notes](#).

## Deprecated features

The deprecated features in this release have not changed since the previous release. For a list of these deprecations, see [Enterprise A2019 \(Builds 1598 and 1610\) Release Notes](#).

## Known limitations in Build 2094

### Migration

- When selecting a bot for migration, values for the **Last Migrated** and **Migrated By** columns might differ for the same bot in the **Available Files** and **Selected** tables.
- The "System" value in the **Migrated By** column indicates that the bot has not been migrated previously.
- When viewing commands and variables associated with each migrated bot, you should only see the unsupported commands and variables. Currently, all commands and variables are shown.

## IQ Bot Build 2079

IQ Bot On-Premises version is available for this release with no additional features or updates since the last release. This version is based on IQ Bot Version 6.5.2 feature and functionality.

[IQ Bot feature comparison matrix](#)

IQ Bot On-Premises version is compatible with the corresponding Automation Anywhere Control Room On-Premises version.

[Automation 360 IQ Bot version compatibility](#)

For a fresh Control Room installation, the user has to upload the IQ Bot package manually. See [Add packages to the Control Room](#) for details.

Go to Automation Anywhere support site to download the package:

[A-People Downloads page \(Login required\)](#).

## IQ Bot fixed features

The fixed features in this release have not changed since the previous release.

## IQ Bot security fixes

The security fixes in this release have not changed since the previous release.

## IQ Bot deprecated features

The deprecated features in this release have not changed since the previous release.

## IQ Bot known limitations

There are no new known limitations in this release.

## Bot Insight new features in Build 2094

Feature	Description
<b>Visualizations</b>	<p>The <b>Visualization</b> widget in the Bot Insight dashboard provides a host of highly customizable widgets that you can use to gain insights on specific scenarios. Vertical and horizontal <b>Clustered</b> and <b>Stacked</b> bars are added.</p> <p><i>Adding a dashboard widget</i></p>

## Bot Insight changed features

The changed features in this release have not changed since the previous release.

## Bot Insight fixed features

The fixed features in this release have not changed since the previous release.

## Bot Insight deprecated features

The deprecated features in this release have not changed since the previous release.

## Bot Insight known limitations

The known limitations in this release have not changed since the previous release.

## Enterprise A2019 (Builds 1598 and 1610) Release Notes

These release notes describe new features, changed features, fixed features, security fixes, deprecated features, and known limitations in Enterprise A2019 (Builds 1598 and 1610).

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

### Enterprise A2019 Builds 1598 and 1610

Build 1598 contains updates for the following:

- [Enterprise Community Edition](#)
- [Bot Insight](#)
- [IQ Bot](#)

Build 1610 contains updates for the following:

- [On-Premises](#)
- [Bot Insight](#)
- [IQ Bot](#)

### New features in Builds 1598 and 1610

Feature	Description
<b>Pre-migration utility for On-Premises</b>	<p>The Automation Anywhere pre-migration utility evaluates your 11.x bots for migration to Enterprise A2019.</p> <p>Run the pre-migration utility to verify whether your existing 11.x bots can be migrated to Enterprise A2019. Use the summary report generated by the utility to identify the bots that can and cannot be migrated and decide if you want to start the migration.</p> <hr/> <p><b>Note:</b> This is an initial version of the pre-migration utility. We plan to include updates to the utility in upcoming releases to help migrate most of your bots.</p> <hr/>
<b>On-Premises Windows installer</b>	Enterprise A2019 On-Premises Windows installer is certified for Azure.
<b>Bot Creator and Bot Runner on Azure Cloud</b>	Users can create and execute bots for devices on Azure Cloud.
<b>Action localization</b>	Labels, buttons, and tooltips are localized to the supported language set.
<b>Updated action packages</b>	<ul style="list-style-type: none"> <li>• Additional REST Web Service error codes for better troubleshooting of API calls</li> <li>• PGP package for encrypting and decrypting files</li> <li>• Improvements to SAP actions</li> </ul>

Feature	Description
<b>Control Room to a SAML-based, SSO-authenticated Control Room</b>	Enterprise A2019 integrates with SAML identity providers (IDPs). Post installation, administrators can switch the Control Room to a SAML-based, SSO-authenticated Control Room.
<b>Move email messages to different folder</b>	The Move message command enables the user to move all the filter-matched emails to a different folder.

## Supported packages

Package	Version
Node Manager	1.0.2110
Application	2.0.0-20191128-060339
Boolean	2.0.0-20191128-060340
Browser	2.0.0-20191128-060342
Clipboard	2.0.0-20191128-060350
Comment	2.0.0-20191128-060351
CSV/TXT	2.0.0-20191128-060352
Database	2.0.0-20191128-060354
DataTable	2.0.0-20191128-060707
DateTime	2.0.0-20191128-060358
Delay	2.1.0-20191128-060359
Dictionary	2.0.0-20191128-060400
DLL	2.0.0-20191128-060648
Email	2.0.0-20191205-100336
Error Handler	2.0.0-20191128-060404
Excel	2.0.0-20191128-060547
Excel_MS	2.0.0-20191128-060434
File	2.0.0-20191128-060407
Folder	2.0.0-20191128-060409
FTP/SFTP	2.0.0-20191128-060412
If/Else	2.0.0-20191128-060414
IR	2.0.0-20191121-100240
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20191128-060423
Keystrokes	2.0.0-20191128-060426
List	2.0.0-20191128-060427

Package	Version
LogToFile	2.0.0-20191128-060428
Loop	2.0.0-20191128-060429
MessageBox	2.0.0-20191128-060429
Mouse	2.0.0-20191128-060430
Number	2.0.0-20191128-060437
OCR	2.1.0-20191121-100301
PDF	2.1.0-20191128-060540
PGP	2.1.0-20191129-100500
Ping	2.0.0-20191128-060544
PlaySound	2.0.0-20191128-060545
Prompt	2.0.0-20191128-150505
Python	2.0.0-20191128-060553
Recorder	1.0.45-20190904-210340
Rest	2.0.0-20191128-060646
SAP	2.1.0-20191128.003143-259
Screen	2.0.0-20191121-100518
SNMP	2.0.0-20191128-060656
String	2.0.0-20191128-060704
System	2.0.0-20191128-150557
Terminal Emulator	2.0.0-20191128-060711
VBScript	2.0.0-20191121-110553
Wait	2.0.0-20191128-060716
Window	2.0.0-20191128-060718
XML	2.0.0-20191017-030831

## Fixed features

The fixed features in this release have not changed since the previous release. For a list of these features, see [Enterprise A2019 \(Builds 1082 and 1089\) Release Notes](#).

## Security fixes

The security fixes in this release have not changed since the previous release. For a list of these fixes, see [Enterprise A2019 \(Builds 1082 and 1089\) Release Notes](#).

## Deprecated features

The deprecated features in this release have not changed since the previous release. For a list of these deprecations, see [Enterprise A2019 \(Builds 1082 and 1089\) Release Notes](#).

## Known limitations in Builds 1598 and 1610

- IQ Bot is not supported in Automation Anywhere Cloud and users cannot register any IQ Bot instance with the Cloud Control Room.
- If a bot is deployed on a device, no other bots can be deployed on that device until the first bot has completed the deployed task.
- When deploying a bot using Unattended Bot Runner on a virtual machine with Windows 10 desktop, users have to enable remote access to the device (**Control Panel > System Properties > Allow Remote Access**).
- Deploying a bot with Bot Runner on a locked device will leave that device in an unlocked state.
- A Bot Creator is not able to view devices as assigned by the Control Room administrator. With this release, changes to the basic role has removed the **View and manage all devices** permission so that unless this permission is expressly granted by the Control Room administrator, the Bot Creator will no longer be able to see other devices in the Control Room. Bot Creators can register their devices directly; however, they will not be able to see the other devices in the Control Room.
- Unable to deploy bots from a private workspace using the wizard. Bot Creators can deploy bots from the editor.
- If users have set up Active Directory for Control Room authentication, changing to SAML or Control Room Database is not supported.
- Device pool administrators can delete a device pool after automation is scheduled and assigned to the pool.
- Users without SMTP can still import bots and packages.
- When users delete a bot from the Public workspace, the same bot is deleted from the Private workspace as well.
- Elastic Search Disaster Recovery backup is not supported.
- Using the Run Task action with the child task using triggers is not supported.
- User cannot export a bot with dependencies if that user does not have access to any of the related dependencies.
- Users cannot check out bots if they are linked through circular dependencies.
- Minimizing the window for some Microsoft Active Accessibility apps, such as Notepad, Calculator, or Remote Desktop Applications, can cause the operation to fail.
- UI Automation, such as Snagit Editor Window for example, will not work in the background unless expressly minimized.
- UI Triggers are not generating events with Snagit Editor or Inflow app.
- Applications such as calculator use different technologies on Windows 10 vs. Windows 2012 or other servers. In these cases, when a bot is created in one server configuration, the bot cannot be carried to another server. User triggers in these cases will not trigger bot deployment and there are no errors in the trigger listener or node manager logs.
- UI Triggers that are configured with multiple triggers are taking as much as 25 seconds to complete.
- UI Triggers with a single capture and a filter do not work with files larger than 2 MB.
- Button events where a user is switched from one window to a new window of an application fail to deploy a bot when listening for UI Triggers.
- For Automation Anywhere Elastic Search Service users, the `C:\ProgramData\AutomationAnywhere` folder has to be removed before installing Enterprise A2019.
- Users cannot enable SMTP with TLS for the On-Premises version of the Control Room (On-Premises only).

- User credentials are not editable (On-Premises only).
- Even when a newly added device is registered correctly, the indication icon does not turn green.
- **Activity - In Progress** table is not cleaning event records until the user performs a hard refresh (F5) of the browser.
- Domains are not shown for the **Device/Run as** tab when creating a role. This option is also missing when running a bot.
- Node manager is not able to establish a handshake SSL connection to the Control Room running on SSL certificate (On-Premises only).
- Repository Management API is incomplete; there is only one URL in the Swagger file.
- Device pools display completed automations, not scheduled automations.
- If a user is not the device pool administrator, the devices are not correctly displayed when editing a device pool.
- For an Unattended Bot Runner, with a device assigned and auto-login credentials set, and **Run as self** selected, the **Run now** option is disabled.
- When a user is running a bot from the Run Wizard and the Bot agent requires an update, after the user has updated the agent from the pop-up box, the user cannot deploy the bot until the user navigates back to the previous page and returns to the workflow to run the wizard.
- Folder triggers do not deploy bots when a folder change event occurs.

## IQ Bot Builds 1598 and 1610

IQ Bot On-Premises version is available for this release with no additional features or updates since the last release.

## IQ Bot changed features

IQ Bot is compatible with A2019 Builds 1598 and 1610.

## IQ Bot fixed features

The fixed features in this release have not changed since the previous release.

## IQ Bot security fixes

The security fixes in this release have not changed since the previous release.

## IQ Bot deprecated features

The deprecated features in this release have not changed since the previous release.

## IQ Bot known limitations

There are no new known limitations in this release.

## Bot Insight new features in Builds 1598 and 1610

Feature	Description
<b>Operation dashboard</b>	<p>The <b>Operation</b> dashboard in Bot Insight displays the <b>Audit</b> dashboard.</p> <p>You can search for the dashboards using the <b>Search</b> text box. You can also customize the dashboards based on your requirements. Role-based access control and permissions are applied to the dashboards so that the dashboard shows data only a specific user is authorized to view.</p> <p>See <a href="#">Operations dashboard</a> .</p>
<b>Analytic visualization widgets</b>	<p>The following new widgets are added:</p> <ul style="list-style-type: none"> <li>• Stacked Bar Chart</li> <li>• Clustered Bar Chart</li> </ul> <p>See <a href="#">Adding a dashboard widget</a>.</p>

## Bot Insight changed features

The changed features in this release have not changed since the previous release.

## Bot Insight fixed features

The fixed features in this release have not changed since the previous release.

## Bot Insight deprecated features

The deprecated features in this release have not changed since the previous release.

## Bot Insight known limitations

The deprecated features in this release have not changed since the previous release.

## Enterprise A2019 (Builds 1082 and 1089) Release Notes

These release notes describe new features, changed features, fixed features, security fixes, deprecated features, and known limitations in Enterprise A2019.

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

## Enterprise A2019 Builds 1082 and 1089

Build 1082 contains updates for the following:

- [Enterprise Community Edition](#)
- [Bot Insight](#)

Build 1089 contains updates for the following:

- [On-Premises](#)
- [IQ Bot](#)
- [Bot Insight](#)

New features in Builds 1082 and 1089

Feature	Description
<b>Universal recorder support for SAP</b>	The universal recorder now supports the SAP graphical interface for fast and accurate control and ease of editing generated scripts.
<b>Citrix support</b>	Citrix agent enables remote application recording for object cloning on Citrix servers and leverages ICA to create user sessions.
<b>Enhanced code editing</b>	Select multiple lines of code in editor to copy, move, disable, enable, as well as disable/enable a line of an action in a bot script.  Users can run bots from a particular line of code or action inside the bot.
<b>Bot import and export</b>	Users can export bots with dependencies into a common zip file, including all actions. Users can manually exclude packages from the export process.  All imported action packages will be automatically installed into the target Cloud Control Room and the bots placed inside the user private workspace.
<b>Background processing</b>	Background processing for Citrix Virtual Apps and Windows native applications. Excel packages inherently support background processes.
<b>REST package</b>	Support for GET, POST (text, XML, and HTML), PUT, and DELETE methods. Authentication types supported include Basic, Logged-in AD user, and NTLM.
<b>OCR Action</b>	Users can capture window and capture image by path.
<b>Active Directory integration for On-Premises</b>	Allowing auto-discovery of sites and domains, Enterprise A2019 On-Premises integrates Active Directory to support multi-domain as well as multi-forest deployments.

Supported packages

Package	Version
Node Manager	1.0.1745

Package	Version
Application	2.0.0-20191016.213334-22
Boolean	2.0.0-20191017-030403
Browser	2.0.0-20191017-030404
Clipboard	2.0.0-20191016.213334-16
Comment	2.0.0-20191017-030408
CSV/TXT	2.0.0-20191017-030409
Database	2.0.0-20191017-030411
DataTable	2.0.0-20191029.062940-3
DateTime	2.0.0-20191017-030416
Delay	2.1.0-20191017-030417
Dictionary	2.0.0-20191017-140648
DLL	2.0.0-20191031-100332
Email	2.0.0-20191024-120209
Error Handler	2.0.0-20191031-100110
Excel	2.0.0-20191024-160417
Excel_MS	2.0.0-20191101-120011
File	2.0.0-20191017-140654
Folder	2.0.0-20191017-140657
FTP/SFTP	2.0.0-20191023-181858
If/Else	2.0.0-20191017-030432
IR	1.0.0-20190923-115359
IQ Bot	2.0.0-20191031-150538
JavaScript	2.0.0-20191031-100128
Keystrokes	2.0.0-20191018-100419
List	2.0.0-20191017-030447
LogToFile	2.0.0-20191017-030447
Loop	2.0.0-20191017-030449
MessageBox	2.0.0-20191017-030449
Mouse	2.0.0-20191017-030450
Number	2.0.0-20191029-100152
OCR	2.1.0-20191017-030626
PDF	2.1.0-20191017-030713
Ping	2.0.0-20191017-030715
PlaySound	2.0.0-20191024-160415

Package	Version
Prompt	2.0.0-20191024-160423
Python	2.0.0-20191031-100238
Recorder	1.0.45-20190904-210340
Rest	2.0.0-20191024-090501
SAP	2.1.0-20191031-100334
Screen	2.0.0-20191017-030809
SNMP	2.0.0-20191023-181621
String	2.0.0-20191025-221016
Terminal Emulator	2.0.0-20191023-181907
VBScript	2.0.0-20191031-100352
Wait	2.0.0-20191017-030828
Window	2.0.0-20191017-030829
XML	2.0.0-20191017-030831

## Changed features

Changed features	
<b>TaskBot</b>	All rich features of MetaBot, such as DLL and code protection using execute permission, are now part of a standard TaskBot. This also includes inline scripting using Python, VBScripts, and more to help reduce the learning curve for new users and provides a uniform bot development experience.

## Fixed features

The fixed features in this release have not changed since the previous release. For a list of these features, see [Enterprise A2019 \(Build 550\) Release Notes](#).

## Security fixes

The security fixes in this release have not changed since the previous release. For a list of these fixes, see [Enterprise A2019 \(Build 550\) Release Notes](#).

## Deprecated features

The deprecated features in this release have not changed since the previous release. For a list of these deprecations, see [Enterprise A2019 \(Build 550\) Release Notes](#).

## Known limitations in Builds 1082 and 1089

- IQ Bot is not supported in Automation Anywhere Cloud and users cannot register any IQ Bot instance with Cloud Control Room.
- To create database tables in Cloud Control Room where internet access is restricted and deploying Liquibase, users are required to unblock the Java process to connect to [www.liquibase.org](http://www.liquibase.org) in order to download the schema and allow java.exe to have internet access.
- The Folder trigger has the following event options: **create**, **modify**, and **delete**. The File trigger only has the **modify** and **delete** event options.
- A bot cannot have duplicate Triggers that point to the same directory.
- Using the action Run Task with the child task using triggers is not supported.
- Activity - In Progress is not cleaning the event record until user does hard refresh (F5) of the browser.
- User cannot export a bot with dependencies if that user does not have access to any of the related dependencies.
- Users cannot checkout bots if they are linked via circular dependencies.
- Minimizing the window for some Microsoft Active Accessibility apps, such as Notepad, Calculator, or Remote Desktop Applications, can cause the operation to fail.
- UI Automation, such as Snagit Editor Window for example, will not work in the background unless expressly minimized.
- If the system Citrix plugin is not updated, the Recorder will not launch.
- If the user renames a previously saved recorder bot, a download error is generated and results in loss of images.
- For Elasticsearch users, remove the `C:\ProgramData\AutomationAnywhere` folder prior to installing Enterprise A2019.
- Users cannot enable SMTP with TLS for the on-premises version of the Control Room (On-Premises only).
- User credentials are not editable (On-Premises only).
- Installer fails to create credentials using Windows Authentication. Use SQL Authentication service credentials (On-Premises only).
- In an On-Premises environment, creating credentials with the Credential Vault is not supported in this release.
- When using the Recorder with Citrix in an On-Premises deployment, the Citrix Agent could generate an internal server error during the recording process.

## IQ Bot Builds 1082 and 1089

IQ Bot Community Edition is available for this release. IQ Bot is not yet available on Automation Anywhere Cloud.

See [IQ Bot Community Edition quick start guide](#) .

## IQ Bot changed features

IQ Bot is compatible with Enterprise A2019 Build 1089.

## IQ Bot fixed features

The fixed features in this release have not changed since the previous release.

## IQ Bot security fixes

The security fixes in this release have not changed since the previous release.

## IQ Bot deprecated features

The deprecated features in this release have not changed since the previous release.

## IQ Bot known limitations

For On-Premises, if IQ Bot and Control Room are installed on the same machine, on restarting the machine, IQ Bot does not work, and displays an error message.

---

**Note:** We recommend restarting Automation Anywhere Control Room Reverse Proxy service to resolve the issue.

---

## Bot Insight new features in Builds 1082 and 1089

Feature	Description
<b>Smart data profiling for country, state, and zip codes</b>	Bot Insight analyzes information provided in the variables to automatically identify information based on the country, state, and zip or postal code. You can use this information to create the <b>World</b> and <b>US Map</b> widgets.  See <a href="#">Editing a data profile</a> .
<b>Business data delete API</b>	Use this API to delete logged data from either the production mode or the development mode for a particular Control Room instance.  See <a href="#">Delete task log data</a> .
<b>Business data profile API</b>	Use this API to extract the business data profile logged in Bot Insight.  See <a href="#">Get bot variables data</a> .
<b>Business data API</b>	Use this API to extract the business data logged in Bot Insight.  See <a href="#">Get task log data</a> .
<b>Resize dashboard widgets</b>	You can resize and save the widgets in the Bot Insight dashboard based on your requirements. When you resize a dashboard widget, other widgets in the dashboard are automatically adjusted to fill in the available layout.  See <a href="#">Editing a dashboard widget</a> .

Feature	Description
<b>US map widget</b>	The <b>US Map</b> widget enables you to visualize and analyze information about Country, State, City, and Zip Code.  See <a href="#">Adding a dashboard widget</a> .
<b>World map widget</b>	The <b>World Map</b> widget enables you to visualize and analyze information about Country, State, Zip Code, Latitude, and Longitude.  See <a href="#">Adding a dashboard widget</a> .
<b>Parent child dashboard</b>	When you create a new bot, Bot Insight automatically creates a default dashboard. If you have a parent bot and a child bot, Bot Insight creates a separate dashboard for each of the bots.  See <a href="#">Bot Insight dashboards</a> .
<b>Notification of variable updates in the standard dashboard</b>	Data profile updates are highlighted with a red dot in the standard dashboard.  See <a href="#">Customizing a dashboard</a> .
<b>Data logging</b>	When you deploy and run a bot on the Bot Runner machine, Bot Insight aggregates all the information about that bot. The published dashboard for that bot displays the aggregated bot information.  See <a href="#">Bot Insight dashboards</a> .
<b>Bot Insight</b>	The <b>Analyze</b> package provides the following functions to enable business analytics in the Bot Insight dashboard: <ul style="list-style-type: none"> <li>• <b>Analyze Open</b></li> <li>• <b>Analyze Close</b></li> </ul>

### Bot Insight changed features

The changed features in this release have not changed since the previous release.

### Bot Insight fixed features

The fixed features in this release have not changed since the previous release.

### Bot Insight deprecated features

The deprecated features in this release have not changed since the previous release.

## Bot Insight known limitations

The known limitations in this release have not changed since the previous release.

## Enterprise A2019 (Build 550) Release Notes

These release notes describe new features, changed features, fixed features, security fixes, deprecated features, and known limitations in Enterprise A2019 (Build 550).

### New features in A2019 Build 550

Feature	Description
<b>On-premises installer</b>	The on-premises installation application for Enterprise A2019.
<b>IQ Bot supports IE11</b>	IQ Bot (Build 550) supports Internet Explorer version 11 (IE11).
<b>Download all documents</b> action	Use the <b>Download all documents</b> action to download the extracted results from an IQ Bot server that was created by running a TaskBot, using the <b>Upload Document</b> action.

### Supported packages in Build 550

The supported packages in this release have not changed since the previous release. For a list of these packages, see [Enterprise A2019 \(Build 543\) Release Notes](#).

### Changed features

IQ Bot (Build 550) Changed Features	
Issue	Description
Language toggle UI redesigned	<p>On the IQ Bot landing page, user can click the language toggle at the top right corner, to select a language from the drop-down list. The UI displays in the selected language.</p> <p>User can select a language from either the Control Room or IQ Bot language toggle icon.</p> <hr/> <p><b>Note:</b> After logging out of the system, the system performs a reset. This requires the user to select the language again at login.</p> <hr/>
<b>Upload document</b> action	The <b>Upload document</b> action lets you to upload documents for processing with IQ Bot, using a TaskBot.

## Fixed features

IQ Bot (Build 550) fixed features:

- Japanese documents using Microsoft Azure Computer Vision OCR engine get classified correctly.
- In the Designer window, during document training, user is able to move from one page to the other successfully along with mapping of form and table fields.
- Download API can download successfully processed documents after moving the bot and learning instance to production.

## Security fixes

No security features are introduced in this build.

## Deprecated features

No deprecated features are introduced in this build.

## Known limitations

IQ Bot (Build 550) known limitations:

- When using Internet Explorer (IE) 11, icons disappear after a page refresh. A hard refresh (Ctrl plus F5) helps fix the issue.
- When using Internet Explorer (IE) 11, if user imports a domain, the system shows an error message. However, the feature works as expected.
- User is unable to migrate IQBA files from other versions of IQ Bot.
- IQ Bot portal does not launch after a machine restart. User has to restart Automation Anywhere Control Room Reverse Proxy Service as well.

## Enterprise A2019 (Build 543) Release Notes

These release notes describe new features, changed features, fixed features, security fixes, deprecated features, and known limitations in Enterprise A2019 (Build 543).

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

## New features in A2019 Build 543

Feature	Description
<b>Next generation bot workbench</b>	<p>Create bots from any device, from anywhere through a web browser. The intuitive new design for applying multiple personas with varying bot building skills and a redesigned work area for simple assembly and deployment. These include:</p> <ul style="list-style-type: none"> <li>• A universal recorder to simplify capturing processes</li> <li>• <b>List</b> and <b>Flow</b> views for TaskBot creation</li> <li>• Powerful bot code management capabilities</li> <li>• Rich variable passing with no cross-language mapping required</li> </ul>
<b>Bot Runner</b>	<p>Access and run bots from the cloud. When bots are deployed to Bot Runners, any dependent actions are also deployed. When updates to Actions are available, the updates are also automatically pushed.</p>
<b>Package manager</b>	<p>The package manager centralizes control over bundled actions to enable users to deploy and upgrade only those targeted actions being used.</p>
<b>Advanced variable types</b>	<p>Access expanded variables and array types for enhanced action implementation, including DateTime, numbers, list, Boolean, dictionary, multi-dimension arrays for reading Microsoft Excel documents, and file data column for .CSV files.</p>
<b>Inline scripting</b>	<p>Native support for Python and VBScript inline scripting languages enables simple data passing between scripts and bots.</p>
<b>New UX</b>	<p>The new user experience provides assistance for users who are getting started and includes step-by-step guidance for common tasks.</p>
<b>Excel automation</b>	<p>Configure Microsoft Excel TaskBot automation without installing Microsoft Office on the Bot Runner machine.</p>
<b>Recording of automation</b>	<p>Record automation, even from a remote device.</p>
<b>IQ Bot</b>	<p>Enterprise A2019 will fully support IQ Bot, the only AI-driven solution for users to automate processing of complex documents.</p>
<b>Bot Insight</b>	<p>The <b>Analyze</b> package provides the following functions to enable business analytics in the Bot Insight dashboard:</p> <ul style="list-style-type: none"> <li>• <b>Analyze Open</b></li> <li>• <b>Analyze Close</b></li> </ul>

Table 1: Supported packages in Build 543

Package	Version
Node Manager	1.0.1221
Application	1.0.0-20190919.040305-1231
Boolean	1.0.0-20190919.040305-1435
Browser	1.0.0-20190919.040305-1287
Clipboard	1.1.0-20190919.040305-1492
Comment	1.0.0-20190919.040305-633
CSV/TXT	1.2.0-20190919.040305-1349
Database	1.1.0-20190919.040305-1287
DateTime	1.0.0-20190919.040305-1189
Delay	1.1.0-20190919.040305-1492
Dictionary	1.0.0-20190919.040305-1337
DLL	1.0.0-20190920.070246-677
Email	1.0.0-20190919.040305
Error Handler	1.0.0-20190919.040305-1333
Excel	1.1.0-20190921.042722-1353
Excel_MS	1.0.0-20190921.042722-1309
File	1.0.0-20190919.040305-1382
Folder	1.0.0-20190919.040305-1337
FTP/SFTP	1.0.0-20190919.040305-660
If/Else	1.0.0-20190919.040305-1375
IR	1.0.0-20190923.062209-1140
IQ Bot	2.0.0-20191031-150538
JavaScript	1.0.1-20190919.040305-989
Keystroke	1.1.0-20190919.040305-1492
List	1.0.0-20190919.040305-1466
Log to File	1.1.0-20190919.040305-1456
Loop	1.0.0-20190919.040305-1466
Message Box	1.1.0-20190919.040305-1492
Mouse	1.1.0-20190919.040305-1492
Number	1.0.0-20190919.040305-1148
PDF	1.1.0-20190919.040305-1492
Ping	1.0.0-20190919.040305-1319
PlaySound	1.0.0-20190919.054049-118

Package	Version
Prompt	1.1.0-20190919.040305-1180
Python	1.0.3-20190919.040305-1287
Recorder	1.0.45-20190904.153347-191
RunTask	1.1.0-20190701.181500-763
SAP	1.1.0-20190923.152217-493
Screen	1.0.0-20190919.040305-1105
SNMP	1.0.0-20190919.040305-359
Step	1.0.0-20190701.181442-695
String	1.1.0-20190919.040305-1469
Table	1.0.0-20190919.040305-719
VBScript	1.0.1-20190919.040305-1334
Wait	1.0.0-20190919.040305-1287
Window	1.0.0-20190919.040305-1333
XML	1.0.0-20190919.040305-717

### Changed features

This build does not include any changed features.

### Fixed features

No fixed features are introduced in this build.

### Security fixes

No security fixes are introduced in this build.

### Deprecated features

No deprecated features are introduced in this build.

### Known limitations

Feature	Limitation description
Recorder	.NET Framework 4.6.1 is required for the Recorder package.
Bot agent	Users of build 543 are required to download and install the latest agent.

Feature	Limitation description
Bot Insight	<p>Bot Insight has the following limitations:</p> <ul style="list-style-type: none"> <li>• Bot Insight dashboard does not support Drag and Drop to move and arrange the dashboard widgets within the dashboard.</li> <li>• The <b>Date</b> widget in the dashboard displays the Unix time stamp.</li> <li>• Bot Insight does not support the <b>Aggregate By</b> feature in the <b>Table</b> widget, if the table contains a <b>Timestamp</b>.</li> <li>• Once the bots run successfully, the default dashboard is generated after 5 to 10 seconds.</li> </ul>

## Community Edition Release Notes

Review the new capabilities in different Automation 360 Community Edition releases.

**Note:** Enterprise A2019 is now called Automation 360. Although the release notes for releases earlier than Automation 360 v.21 reference the old product name, the content in these releases notes is applicable and relevant to Automation 360.

Follow the links to view the release note updates for the respective release.

### Related concepts

[Automation 360 Release Notes](#)

Review the new capabilities, changes, fixes (resolved issues), security fixes, deprecated features, and limitations in each release.

### Related reference

[Automation 360 v.21 Cloud Preview Sandbox Release Notes](#)

## Automation 360 v.21 Community Edition Release Notes

*Release date: 02 June 2021*

Review the new features in the Community Edition of the Automation 360 v.21 (Build 9637) release.

- [RPA Workspace](#)
- [AARI](#)
- [Discovery Bot](#)

### RPA Workspace

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>Automation 360 navigation enhancements</b></p> <p>We have enhanced the overall readability and accessibility of the Automation 360 interface. To make navigation easier, menus and views are organized based on frequently used features and related tasks.</p> <p>The interface includes the following updates:</p> <ul style="list-style-type: none"> <li>• The Device, Profile, and Help icons are now located at the bottom of the navigation menu, consolidating all controls on the left for easy access.</li> </ul> <p>When you click these icons, flyout panels of content and actions are shown.</p> <ul style="list-style-type: none"> <li>• The side navigation menu can be collapsed to a slim bar to maximize the main workspace area.</li> </ul> <p>You can continue to use the side navigation in collapsed mode, with flyouts for each section.</p> <p><a href="#">Automation 360 navigation updates</a></p>
<p><b>Deploy workload automation on a multi-user Windows terminal server</b></p> <p>To optimize workload automation and multi-user devices, you can deploy workload automations on a multi-user Windows terminal server so that a single device can process multiple work items concurrently.</p> <p><a href="#">About multi-user devices</a>   <a href="#">About device pools</a></p>
<p><b>New actions in the SAP BAPI package</b></p> <p>Use the following new actions:</p> <ul style="list-style-type: none"> <li>• <b>Run standard workflow:</b> Runs a standard workflow in SAP BAPI.</li> <li>• <b>Run custom workflow:</b> Runs a custom workflow in SAP BAPI.</li> </ul> <p><a href="#">SAP BAPI package</a></p>
<p><b>New actions in File package</b></p> <p>Use the following new actions:</p> <ul style="list-style-type: none"> <li>• <b>Get name:</b> Reads a file name and stores it to a string.</li> <li>• <b>Get path:</b> Reads the path of the file and stores it to a string.</li> </ul> <p><a href="#">File package</a></p>
<p><b>Common table expression supported in Database package</b></p> <p>You can now use common table expression (CTE) in the <b>Read from</b> action using the <code>WITH</code> keyword in SQL-compliant databases such as Oracle and MySQL. Use CTE statements within a SQL query to simplify complex joins and subqueries.</p> <p><a href="#">Using the Read from action</a></p>
<p><b>Support for large numbers in Number package</b> (Service Cloud case ID:00557619)</p> <p>You can now perform mathematical operations for large numbers with more precision in the Number package.</p> <p><a href="#">Number package</a></p>

New features
<p><b>Snowflake database support using ODBC driver</b> (Service Cloud case ID:00761695)</p> <p>Snowflake ODBC driver is now supported in the Database package. You can connect to the Snowflake database using ODBC-based client applications.</p> <p>The following actions support this feature:</p> <ul style="list-style-type: none"> <li>• Connect</li> <li>• Disconnect</li> <li>• Read from</li> <li>• Export to data table</li> <li>• Insert/Update/Delete</li> </ul>
<p><b>Variables: new features and enhancements</b> (Service Cloud Case ID:00740585)</p> <ul style="list-style-type: none"> <li>• Edit the variable name after the variable is created.</li> <li>• Delete all or a specific selection of unused variables from a bot.</li> </ul>
<p><b>Universal Recorder new features and enhancements</b></p> <ul style="list-style-type: none"> <li>• Record object interactions in applications built on the Electron framework.</li> <li>• Perform double-click in all supported applications and browsers.</li> </ul>
<p><b>Limit credential attribute use to password fields only</b> (Service Cloud Case ID:00740585)</p> <p>When you create or edit a credential attribute, ensure that bots input the attribute value only in fields that are identified as password fields by selecting the <b>Set this attribute as a password</b> option.</p>
<p><b>Default names for output variables</b></p> <p>When you configure an output variable for the actions in the Error handler and Python Script packages, the Control Room automatically generates a descriptive default variable name. If you create more than one output variable for an action, the subsequent variable names are appended with a <i>-1</i>, <i>-2</i>, <i>-3</i>, and so on to avoid a variable name conflict.</p>
<p><b>New string action to support nested variables</b></p> <p>Use the <b>String &gt; Evaluate value</b> action to compare a user-specified string variable with the string variables in the bot. If a match is found, the action returns the value of the matching variable.</p> <p><a href="#">String package</a></p>
<p><b>Delete Global values</b></p> <p>A user with the <b>AAE_Admin</b> role can delete a global value from the <b>All global values</b> page.</p> <p><a href="#">Global values</a></p>
<p><b>ODBC driver support for all connection strings</b> (Service Cloud Case ID: 00748887, 00777676)</p> <p>An Open Database Connectivity (ODBC) driver is now available to support all the ODBC connection strings in the same way it was used in the Enterprise 11.x version. Using SQL as a standard for accessing and managing data, you can connect to MySQL, Google BigQuery, Snowflake, and other databases using the ODBC driver.</p>

**New features****Share a DLL session**

You can now share a DLL session between bots.

## Automation Anywhere Robotic Interface (AARI)

**New features****Download, delete, or view files in browser in initial forms or tasks**

Users can now use the **Select File** element to download files that are uploaded to the initial forms or tasks, and they can also delete files or access the hyperlink file to view the file in within the browser. The uploaded file can be accessed as a hyperlink, and new icons are available for download and delete.

**Enhancement to team roles**

The AARI team consists of three roles:

- **Member:** Can create, view, and delete their own requests. All the tasks are automatically assigned to the member when they create the request in a private team. In a shared team, the member can assign tasks to other members.
- **Owner:** Can create, view, delete, and assign all the requests from the members in the team.
- **Admin:** Can create, view delete, and assign all the requests from the members in the team. The admin can also modify the team.

An AARI admin or manager can edit their teams and update their team members' roles. They also have the option to add or remove team members. The AARI manager is the team admin by default when they create a team.

**Assign to me feature in tasks**

When a task is unassigned and users access the tasks, use the **Assign to me** option to allow the tasks to be assigned to the current user so that they can immediately access the form.

[Assign or unassign a task](#)

**New Bot page**

When AARI team members with attended Bot Runner licenses access the web interface, they are automatically redirected to AARI Assistant. Users can view all the bots created by them on this page. They can also pin, search, and sort their assigned bots.

**New team reference in Request and Process pages**

The user can now reference the team from which a request is created by referring to the new **Team** column in the **Request** page or the team name added in the process tile in the **Process** page, to help guide their team assignment.

**New Request Visibility field** (Service Cloud case ID: 00718119)

Request visibility enables users to allow or restrict access to a request they created to other team members. When the **Request Visibility** field is set to **Shared**, all the requests are accessible by all members, owners, and team admins. If the field is set to **Private**, the requests are available only to the user who has created the request, owner, and the team admin.

New features
<p><b>Enhancement to the Processes page</b></p> <p>The following enhancements are available on the <b>Processes</b> page:</p> <ul style="list-style-type: none"> <li>• Sort the processes by name, in ascending or descending order.</li> <li>• Toggle the pinning of a process.</li> <li>• Use the responsive view to adjust the display to the screen size.</li> </ul>
<p><b>AARI Assistant for attended Bot Runners</b></p> <p>The AARI Assistant application enables users with the attended Bot Runner license to access their bots without logging in to the Control Room. AARI web users can use the AARI Assistant when the attended Bot Runner license is enabled along with their AARI User license without impacting their existing functionality.</p> <p><a href="#">About AARI Assistant</a></p>
<p><b>Add rows from header row context menu</b></p> <p>Only the header row is displayed when a form that has a table is launched during bot runtime. Use one of the following methods to add new rows to the table:</p> <ul style="list-style-type: none"> <li>• Header row context menu of the table</li> </ul> <p><a href="#">Using the Table element</a></p> <ul style="list-style-type: none"> <li>• The <b>Set</b> action in a bot</li> </ul> <p><a href="#">Using Set action</a></p>

## Discovery Bot

New features
<p><b>Sort for a process tile from the Processes page</b></p> <p>You can now use the sort field to help you locate a process tile quickly. From the <b>Processes</b> page, use the drop-down menu to sort on a process tile based on the process name in alphabetical order. Alternatively, you can sort in the order of the newest process created to the oldest process and vice versa.</p> <p><a href="#">Create a Discovery Bot process</a></p>
<p><b>Enhancements to opportunities</b></p> <p>You can now review and analyze automatically generated (or system-generated) opportunities immediately from the <b>Opportunities</b> page. Auto-generated opportunities are created when at least two recordings are approved by the user. You can create a custom opportunity from an auto-generated opportunity and apply the <b>Model</b> and <b>Filter</b> options to target a specific opportunity for automation.</p> <p>You can now prioritize opportunities based on a simple formula for all recordings in a process. From the Opportunities table, you can view the cost without automation and savings for an opportunity. The system automatically calculates the cost and potential savings for each opportunity generated. You can customize these metrics based on your organization's model for cost and savings.</p> <p><a href="#">Review opportunities and convert to bot</a></p>

**New features****Generated PDD files are available on your local server**

The generated PDD file for an opportunity is now stored locally on your server for On-Premises deployments. The existing PDD files are automatically moved to the new location and are not deleted when a re-installation or upgrade is performed in the Control Room.

[Prerequisites for Discovery Bot](#)

## Community Edition A2019.20 Release Notes

*Release date: 14 April 2021*

Review the new features in the Community Edition A2019.20 release (Build 8846).

- [Community Edition](#)
- [AARI](#)
- [Discovery Bot](#)
- [Bot Insight](#)

### Community Edition

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

**What's new****Automate SAP-related tasks using SAP BAPI**

Use the actions available in the SAP BAPI package to automate SAP-related tasks using SAP BAPI.

[SAP BAPI package](#)

**Default names for output variables**

When you configure an output variable for the following packages, the Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.

- Browser
- CSV/TXT
- Email
- Excel advanced
- JavaScript
- Loop
- Recorder
- VBScript
- Window

What's new
<p><b>PDF split with blank pages supports scanned image documents</b> (Service Cloud case ID: 00683923)</p> <p>Use the PDF <b>Split</b> action to separate a blank page from pages with scanned images. With pixel-based split, you can now use <b>Split document</b> to split a PDF with blank page separators for scanned (image-based) documents.</p>
<p><b>SMTP port range expanded to include ports 1 through 65535</b></p> <p>The Email package now supports ports in the range of 1 through 65535 for the SMTP server. You can use the <b>Send</b> email action by configuring the SMTP port in this range.</p>
<p><b>New actions in the Active Directory package</b></p> <ul style="list-style-type: none"> <li>• <b>Update account options:</b> Sets account attributes for the user.</li> <li>• <b>Change user password:</b> Use this option to change a user's password.</li> </ul> <p><a href="#">User account operations</a></p>
<p><b>Enhancement to Create user action in Active Directory package</b></p> <p>You can now use the <b>Create user</b> action to create an Active Directory user with password.</p> <p><a href="#">Using the Create user action</a></p>
<p><b>Universal Recorder expanded support and new features</b></p> <p>Use the Universal Recorder to perform the following:</p> <ul style="list-style-type: none"> <li>• Automate clicks and data retrieval in drop-down lists and combo boxes in Oracle EBS applications such as Compass.</li> <li>• Link an object that the bot cannot reliably identify to a nearby object (such as a link or button) that is easier for the bot to find. Use this feature in MSA, UI Automation, or Java applications.</li> </ul>
<p><b>Support for new languages in variable names</b></p> <p>You can now use Czech, Danish, Dutch, Finnish, French, German, Hungarian, Italian, Norwegian, Polish, Portuguese, Romanian, Spanish, and Swedish characters in variable names.</p> <p><a href="#">Unicode range supported in variables</a></p>
<p><b>Search and add child bot in the parent bot</b></p> <p>Search for a child bot in the public and private workspaces so that you can add it in the parent bot. You can search for the child bot from the Bot editor and the <b>Run</b> action of the Task Bot package.</p> <p><a href="#">Using the Run action</a>   <a href="#">Bot editor for creating bots</a></p>
<p><b>Obtain information about user that deployed the bot</b></p> <p>Use the <code>AATaskInvoker</code> system variable to return the username, first name, last name, and email of the user that ran or scheduled the bot. If the bot is deployed to an attended Bot Runner, this variable returns information about the logged-in user. If the bot is deployed by a trigger, this variable returns information about the user who set the trigger.</p> <p><a href="#">System settings and parameters</a></p>

What's new
<p><b>New condition in If package</b> (Service Cloud case ID: 00536088, 00690073,00717514, 00737243, 00702383)</p> <p>Use the new <b>Window with same title does not exist</b> or <b>Window with same title exist</b> condition available in the If package to verify whether a window with the same title exists or whether the window title has changed.</p> <p><a href="#">If package</a></p>
<p><b>Google packages are now generally available</b></p> <p>Google Calendar, Google Drive, and Google Sheets packages are now generally available in Automation 360, and contain these new actions:</p> <ul style="list-style-type: none"> <li>• <b>Write from data table</b> and <b>Insert row/column</b> actions in the Google Sheets package.</li> <li>• Each Google package contains a <b>Connect</b> action to authenticate your account before adding other actions from that package to your automation. This action replaces the deprecated <b>OAuth</b> action from the G-Apps package.</li> <li>• Each Google package contains a <b>Disconnect</b> action to terminate the connection.</li> </ul> <p><a href="#">Using the Connect action for Google packages</a></p>

## Automation Anywhere Robotic Interface (AARI)

What's new
<p><b>Get Storage file action</b></p> <p>The new <b>Get Storage file</b> action in the <b>AARI Web</b> package enables you to download storage files to a bot device.</p> <p><a href="#">AARI web package</a></p>
<p><b>Upload files in initial forms or tasks</b></p> <p>Add the <b>Select File</b> element to forms to enable users to select and upload files in the initial forms or tasks in the web interface. Users can browse to upload a new file or replace an existing file. The uploaded file is shown as a hyperlink and redirects users to a new tab when opened.</p> <p><a href="#">Configure processes</a></p>
<p><b>Hyperlinks support for initial forms or tasks</b></p> <p>Use the new <b>Hyperlink</b> element to add links to forms and access them in initial forms and tasks.</p> <p><a href="#">Configure processes</a></p>
<p><b>Configure a scheduler user for each process</b> (Service Cloud case ID: 00713786)</p> <p>As an AARI administrator, you can now configure a scheduler user for each process to allocate the Control Room resources (devices and unattended Bot Runners) on the web interface. By default, the <b>Global scheduler</b> user is selected if a scheduler user is not configured for individual processes.</p> <p><a href="#">Configure scheduler user for AARI on the web</a></p>

What's new
<p><b>Update to properties panel for human task</b> (Service Cloud case ID: 00718109)</p> <p>As a Bot Creator, you can choose to not configure any actions in the human task by selecting the <b>Make the form read-only</b> check box in the <b>Properties</b> panel. The human task does not require any input and it is executed automatically to the next task.</p>
<p><b>Bookmark any page as landing page for AARI on the web</b></p> <p>The web interface is now enhanced to a new multiple page system so that you can directly bookmark any page (<b>Requests</b>, <b>Tasks</b>, or <b>Recycle Bin</b>) as your landing page. Also, the tabs in the web interface have been removed so that the requests are opened one at a time and not simultaneously. To perform multiple tasks, you can open the requests pages in different browser tabs.</p>
<p><b>Navigation enhancement in AARI on the web</b></p> <p>The web interface is now enhanced with a side navigation pane so that you can easily navigate to various pages (<b>Processes</b>, <b>Requests</b>, <b>Recycle Bin</b>, and <b>Tasks</b>).</p>
<p><b>New processes page</b> (Service Cloud case ID: 00694786)</p> <p>As an AARI user, navigate to your assigned processes and create new requests by using the new <b>Processes</b> page in the web interface. Use the navigation bar to quickly access the page.</p>
<p><b>Enhancements to the Button element</b></p> <ul style="list-style-type: none"> <li>• Use the <b>Disallow button click when this form is first loaded</b> option to disable the <b>Button</b> element in a form when it is displayed for the first time during bot runtime.</li> <li>• Use the <b>Subtle</b> option in the <b>Button type</b> drop-down menu if you want the button element to appear as a link during bot runtime.</li> </ul> <p><i><a href="#">Using the Button element</a></i></p>
<p><b>Enhancement to the form logo</b></p> <p>You can now use the <b>Logos in footer</b> field option to select up to two separate logos that are displayed in the footer of the form during bot runtime.</p> <p><i><a href="#">Create a form</a></i></p>

## Discovery Bot

What's new
<p><b>Search for a business process from the Processes page</b></p> <p>You can now use the search field to help you locate a specific process by name. The field is not case-sensitive. The search field is available from the <b>Processes</b> page.</p> <p><i><a href="#">Create a Discovery Bot process</a></i></p>
<p><b>View all captured images from the screenshot modal window</b></p> <p>You can now navigate across all captured screenshots when you click an image in full size from the modal window. Click the pagination located below the image to select a step number or use the right or left arrows to quickly display all captured images.</p> <p><i><a href="#">Record a Discovery Bot business process</a></i></p>

What's new
<p><b>Process Discovery package is included in default packages</b></p> <p>The Process Discovery package is now included in the default packages. You can preload the default package when you connect to your device. Preloading the package helps to speed the start time of the recorder the first time you begin recording a process</p> <p><i><a href="#">Prerequisites for Discovery Bot</a></i></p>
<p><b>Recorder enhancements</b></p> <p>You can now perform actions such as double-click, drag-drop, click and hold, and text select when recording a business process. Actions performed using keyboard strokes are displayed in the <b>Data</b> field. Double-click is captured by the recorder and displayed in the screenshot from the <b>Recordings</b> page.</p> <hr/> <p><b>Note:</b> The Discovery Bot recorder does not capture the drag-drop and click and hold actions from the <b>Recordings</b> page. To include these actions performed during the recording, you can document the individual steps in the <b>Step description</b> text field for the analyst.</p> <hr/> <p><i><a href="#">Record a Discovery Bot business process</a></i></p>

## IQ Bot

Known limitations
IPv6 addresses are not supported for IQ Bot, so ensure that you use only IPv4 addresses.

## Bot Insight

What's new
<p><b>AAE_Admin role access to operations API from Power BI connector</b></p> <p>The Power BI connector now provides the <b>AAE_Admin</b> user role access to the botrundata operational API. With this role, you can connect to the botrundata API and extract operational metrics to be analyzed and visualized within Power BI.</p>
<p><b>Enhancements to the publish (production) dashboard</b></p> <p>Users with the <b>AAE_Bot Insight Admin</b> and <b>AAE_Bot Insight Expert</b> role can now edit the published dashboard. You can use the save as option to save the production dashboard as a custom production dashboard and add widgets to your custom dashboard. You can also delete a default production dashboard and a custom production dashboard.</p> <p><i><a href="#">Save a published dashboard</a>   <a href="#">Delete a published dashboard</a></i></p>

---

**Important:** The supported packages information is moved to this topic: [Viewing package versions available in the Control Room](#).

---

# Community Edition A2019.19 Release Notes

Release date: 05 February 2021

Review the new features in the Community Edition A2019.19 release (Build 8145).

- [Community Edition](#)
- [AARI](#)
- [Discovery Bot](#)

## Community Edition

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

New features
<p><b>New features in Data Table package</b> (Service Cloud case ID: 00656843, 00707635)</p> <ul style="list-style-type: none"> <li>• Use the <b>Change column type</b> action in the Data Table package to perform operations on the column of a data table. Use this action to change the column data type to <b>Boolean</b>, <b>Datetime</b>, <b>Number</b>, or <b>String</b>.</li> <li>• Sort the data in the data table in <b>Number</b>, <b>Datetime</b>, <b>Boolean</b>, or <b>String</b> format.</li> </ul> <p><a href="#">Data Table package</a></p>
<p><b>New action in App Integration package</b></p> <p>Use the <b>Capture scrollable text</b> action to extract text from the selected window or any control within the selected window and save it to a variable. If you click any control within the window, then text from that specific control is extracted. If you click outside the window, then all the text from that window is extracted.</p> <p><a href="#">App Integration package</a></p>
<p><b>New encoding combo box option in Terminal Emulator for VT Series</b></p> <p>To send and receive Japanese text, you can now use the <b>Encoding</b> and <b>CodePage</b> combo boxes when you connect to the Terminal Emulator for the VT series terminal type.</p> <p><a href="#">Using the Connect action</a></p>

New features
<p><b>New actions in Active Directory package</b></p> <p>Use the following actions in the Active Directory to automate a task:</p> <ul style="list-style-type: none"> <li>• Move a computer <i>Using the <a href="#">Move computer action</a></i></li> <li>• Move an organizational unit <i>Using the <a href="#">Move organizational unit action</a></i></li> <li>• Add users to a group <i>Using the <a href="#">Add users to group action</a></i></li> <li>• Remove users from a group <i>Using the <a href="#">Remove users from group action</a></i></li> </ul>
<p><b>New system variable for new line character</b> (Service Cloud case ID: 00669232, 00672775, 00673578)</p> <p>Use the \$String:Newline\$ system variable to add a new line character. This variable adds a new line character in various applications regardless of the operating system of the device.</p>
<p><b>Zero-size form for Enterprise A2019</b> (Service Cloud case ID: 00677611)</p> <p>The <b>Run</b> action uses the zero-size form with name <code>AAZeroSizeForm</code> that can be used by DLLs to identify zero-size forms created by Enterprise A2019.</p>
<p><b>Enhancement to define parent path in Active Directory</b></p> <p>When you establish a connection with an LDAP server, you can now select the LDAP path by connecting to the server.</p> <p><i>Using the <a href="#">Connect action</a></i></p>
<p><b>Obtain information about Run-As user after bot deployment</b></p> <p>Use the <code>AATaskExecutor</code> system variable to return the username, first name, last name, and email of the user that ran the bot. If the bot is deployed on an attended Bot Runner, this variable returns information about the logged-in user. If the bot is deployed by a trigger, this variable returns information about the user associated with that Bot Runner license.</p> <p><i>System settings and parameters</i></p>
<p><b>Enhancements to the Recorder</b></p> <ul style="list-style-type: none"> <li>• Universal Recorder now supports object capture in Mozilla Firefox. You must install the A2019 extension from Mozilla Firefox browser add-ons.</li> <li>• Capture table, grid view, and main window objects from SAP applications.</li> </ul> <p><i>Universal Recorder supported applications and browsers   <a href="#">Actions performed on objects captured with Universal Recorder</a></i></p>

## Automation Anywhere Robotic Interface (AARI)

New features
<p><b>New filter task in the process editor</b></p> <p>In the process editor, the <b>Filter Task</b> enables users to filter variables such as human or bot task output with a specific filter criterion.</p> <p><a href="#">Create an AARI process</a></p>
<p><b>New process task in the process editor</b></p> <p>Use the new <b>Process Task</b> option in the process editor to call a subprocess within the main process. This feature enables you to separate tasks into different processes instead of including all the tasks in a single process. Multiple teams can now work at the same time on different tasks within the main process and remain segregated, without any conflicts.</p> <p><a href="#">Create an AARI process</a></p>
<p><b>Hide a task or view a hidden task</b></p> <p>With a Bot Creator license, you can now perform the following:</p> <ul style="list-style-type: none"> <li>• Hide the display of human and bot tasks by selecting the <b>Hide this task after completion</b> option in the process editor.</li> <li>• View a hidden human or bot tasks by selecting the <b>View hidden tasks</b> option in the tasks view page.</li> </ul> <p><a href="#">Create an AARI process</a></p>
<p><b>Edit title in process editor</b></p> <p>Users can now edit the title in the process editor.</p>
<p><b>Rich-text editor updates (web interface)</b></p> <p>In the web interface, you can use rich-text editor features such as bold text, italics, underline, alignment, formatting, color, and size in tasks.</p>
<p><b>Table element updates (web interface)</b></p> <p>In the web interface, the <b>Table</b> element now supports the use of date, number, drop-down, and text values in tasks.</p>
<p><b>Updates to elements in form builder</b></p> <p>The form builder now includes the following new elements:</p> <ul style="list-style-type: none"> <li>• <b>Select Folder</b> element: Add an upload folder option in the form. <a href="#">Using the Select Folder element</a></li> <li>• <b>Hyperlink</b> element: Assign a URL in the form. <a href="#">Using the Hyperlink element</a></li> </ul>
<p><b>Enhancement to the Checkbox action trigger</b></p> <p>If a form with a <b>Checkbox</b> element is used within a trigger loop package, you can now use the <b>Value selected</b> and <b>Value unselected</b> trigger actions.</p> <p><a href="#">Trigger loop package</a></p>

## Discovery Bot

### New features

#### View the duration of each recorded step

A recorded step is now displayed in minutes and seconds for the business user and analyst. Use this information to understand which steps are a bottleneck in the current process and will provide most benefit from automation. The step duration is displayed from the **Recordings** page (below the screenshot image), and from the **View process** and **View opportunities** page from the Preview pane window.

[Record a Discovery Bot business process](#)

---

**Important:** The supported packages information is moved to this topic: [Viewing package versions available in the Control Room](#).

---

## Community Edition A2019.18 Release Notes

*Release date: 05 January 2021*

Review the new features and supported packages in the Community Edition A2019.18 release (Build 7560).

- [Community Edition A2019](#)
- [AARI](#)
- [Discovery Bot](#)
- [Bot Insight](#)
- [Supported packages](#)

## Community Edition A2019

---

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

---

Build 7560 (Community Edition) is compatible with Bot agent 16.19.8232.

### New features

#### Configure timeout in Bot Migration package

When migrating bots, you can now set a timeout value in the range of 3 through 90 minutes (default value is 90 minutes). If the migration of any specific bot is not completed within the set time, a timeout message is displayed and the migration process moves to the next bot.

New features
<p><b>Use regular expressions in variables</b> (Service Cloud case ID: 00628227)</p> <p>Use regular expressions (regex) in value type variables to specify the entity on which you want to perform an operation. For example, actions in the File, Folder, String, and Window packages allow use of regular expression in variables.</p> <p>When 11.x or 10.x bots with commands that use regular expressions in variables are migrated, if their equivalent actions in Enterprise A2019 do not support regular expressions, the regular expression is converted to string in the migrated bots.</p>
<p><b>Recorder enhancements</b></p> <ul style="list-style-type: none"> <li>• Use the AISense Recorder <b>Define</b> option to record an interaction, such as click active text, with an object that is only visible when you hover the mouse over the object.</li> <li>• If you record a click and keystrokes in a text box with a <b>Control Type</b> of <code>PASSWORD_TEXT</code>, the <b>Recorder</b> does not capture the keystrokes entered into the field. Instead, the action selects the <b>Set text</b> option and offers users the option to select a credential from the Credential Vault, enter a credential variable, or enter an insecure string.</li> </ul>
<p><b>Efficiently map input and output variables between parent and child bots</b> (Service Cloud case ID: 00537090, 00698697)</p> <p>For input variables, use the <b>Quick map</b> option to select the variables and set the values for the parent bot to pass. For output variables, use the <b>Multiple variables</b> tab to associate each dictionary key with a variable. This feature eliminates the need to use actions to extract the output dictionary values.</p> <p><i>Task Bot package   Using the Run action</i></p>
<p><b>Support for PowerBuilder application in App Integration package</b> (Service Cloud case ID: 00680703)</p> <p>The App Integration package now supports PowerBuilder to capture and extract text from a window application. The <b>Capture text of window</b> action enables you to open a PowerBuilder screen to capture all the data and verify the captured text.</p>
<p><b>New action in Terminal Emulator package</b></p> <p>Use the <b>Search Field</b> action in the Terminal Emulator package to search for a field based on the text it contains. This action returns the name or index of the field based on the option selected.</p> <p><i>Terminal Emulator package</i></p>
<p><b>New action in PDF package</b></p> <p>Use the <b>Get Property</b> action in the PDF package to retrieve the properties of a PDF file and assigns the properties to a dictionary variable.</p> <p><i>Using the Get property action</i></p>

## New features

### New actions in Browser package

Use the following actions in the Browser package:

- **Close:** Closes a Google Chrome browser window or tab.
- **Get source code:** Retrieves the source code of a web page and saves it to a string variable.
- **Go back:** Returns to a web page that you previously visited in the current tab.
- **Open:** Opens the browser to a specific web page in an existing tab, new tab, or window.
- **Run JavaScript:** Executes JavaScript in a web page.

*Browser package*

### Specify application window dimensions

Use the **Resize windows** option to set the window height and width to specific dimensions or to the dimensions at which it was captured. This feature enhances the bot's ability to identify the target object.

The following packages support this feature:

- App Integration
- If **Image recognition** condition
- If **Legacy Automation > Window Control** condition
- Image Recognition
- Simulate keystrokes
- Legacy Automation **Desktop > Manage windows controls** action
- Loop **While > Image recognition** condition
- Loop **While > Legacy Automation > Window Control** condition
- Mouse
- OCR
- Screen

### Support for function keys in Terminal Emulator package

Function keys (F1 through F24) are now supported to automate processes using ANSI and VT100 terminals in the Terminal Emulator package.

### Use regex case insensitive flag for Window title

Enable the regex **Case insensitive** flag to identify a **Window title** field as not case-sensitive. This feature enables you to successfully run the bots even if the letter case does not match the captured window title.

The following packages and actions support this feature:

- Wait
- Image Recognition
- Simulate keystrokes
- Mouse > **Click** action
- Legacy Automation **Desktop > Manage windows controls**
- OCR > **Capture window, Capture area**
- Screen > **Capture window, Capture area**
- Recorder > **Capture**
- Window: **Activate, Close, Maximize, Minimize, Resize**

## Automation Anywhere Robotic Interface (AARI)

<p><b>New features</b></p>
<p><b>New AARI web package</b></p> <p>Use the AARI web package to perform actions such as assign, query, and cancel tasks; create and query requests; and retrieve a list of team members.</p> <p><a href="#">AARI web package</a></p>
<p><b>Filter by time</b></p> <p>You can now filter your requests and tasks by time:</p> <ul style="list-style-type: none"> <li>• <b>Requests</b> tab: Use the <b>Created</b> and <b>Updated</b> options in the <b>Filter</b> window to select any dates.</li> <li>• <b>Tasks</b> tab: Use the <b>Task created</b> and <b>Task updated</b> options in the <b>Filter</b> window to select any dates.</li> </ul> <p><a href="#">Filter and search for a request</a>   <a href="#">Filter and search for a task</a></p>
<p><b>View updated dates</b></p> <ul style="list-style-type: none"> <li>• Use the new <b>Updated</b> column in the <b>Requests</b> tab to view the dates and time of a request that was last updated.</li> <li>• Use the new <b>Task Updated</b> column in the <b>Tasks</b> tab to view the date and time of a task that was last updated.</li> </ul>
<p><b>Variable options</b></p> <p>In the <b>Insert a variable</b> window, the <b>Variable</b> field now shows child elements of available references, which include <b>Dictionary</b>, <b>List</b>, <b>Record</b>, and <b>Table</b> variable types.</p>
<p><b>Delete a request</b></p> <p>AARI administrators, managers, and users can now delete requests created by the AARI process. The AARI administrator can delete any requests. AARI managers can delete requests of the team for which they are the owner. AARI users can delete only the requests they have created.</p> <p><a href="#">Delete a request</a></p>
<p><b>Automatically assign managers and users</b></p> <p>Users can now select the <b>Auto assign this task</b> option in the <b>Human Task</b> to assign managers or users to the task. Users can also select the <b>Auto assign the target task to</b> option in the <b>Go to</b> element to assign managers to the task.</p> <p><a href="#">Create an AARI process</a></p>

## Discovery Bot

New features
<p><b>Access Discovery Bot capabilities in Community Edition</b></p> <p>Discovery Bot is now available in the Community Edition and the free trial version. Log in to the Control Room and click the Discovery Bot tab on the left panel to get started.</p> <p>The available limits to create processes, recordings, views, and opportunities are displayed on the respective page. Create any number of bots and download a PDD for your personal use as required.</p> <p>A single Community Edition user is a multi-role user with Admin plus Business user plus Analyst permissions.</p> <p><a href="#">Get started with Discovery Bot</a></p>
<p><b>Use Model option for system-generated views</b></p> <p>You can now use the <b>Model</b> option to compare and find the best aggregated view for your recordings. Use this option to save as many views with different combinations as required.</p> <p>You can also save the view as a manual view to further customize your view and compare side-by-side. Select either an <b>Easy</b> or <b>Strict</b> model so that you can view recordings where the steps are the same versus recordings with different results with more branches in the process path.</p> <p><a href="#">Create a process view with branches and opportunities</a></p>
<p><b>Use Filter option for system-generated views</b></p> <p>You can now use the <b>Filter</b> option to use a set of values to compare different sections of a process across various recordings by selecting a specific path and step filter. Used along with the <b>Model</b> option, the path and step filter options for a system-generated or manual view can help you to determine and decide on a good candidate for automation.</p> <p><a href="#">Create a process view with branches and opportunities</a></p>
<p><b>Use toggle frequency counter option for system-generated views</b></p> <p>You can now use the toggle frequency counter to display the number of recordings that a particular path takes in the flow in a system-generated view. Use this option to help you understand the frequency of the path compared to other recordings or views.</p> <p><a href="#">Create a process view with branches and opportunities</a></p>
<p><b>Remove recording screenshot for data privacy</b></p> <p>Use the <b>Screen</b> option (icon) to display or hide the recording screenshot before submitting the recording for the analyst to review. Use this option when you do not want to share personal image details with the analyst.</p> <p><a href="#">Record a Discovery Bot business process</a></p>
<p><b>Download PDD from the Opportunities table</b></p> <p>You can now download a process definition document (PDD) for an opportunity directly from the Opportunities table listed on the <b>Opportunities</b> page. The PDD is automatically generated when the opportunity is created. After the PDD is generated, the field changes from generating PDD to <b>Download PDD</b>. You can then download and save the document.</p> <p><a href="#">Review opportunities and convert to bot</a></p>

## Bot Insight

New features
<p><b>Access Bot Insight data from Tableau</b></p> <p>Use the Tableau connector in Bot Insight to access business and operational information. The Tableau connector connects to the Bot Insight APIs to create various business and operational metrics that you can analyze and visualize within Tableau.</p> <p><a href="#">Configure Tableau web data connector in Bot Insight</a></p>

## Supported packages

Package	Version
Application	2.1.0-20201112-22332
App Integration	2.3.0-20201210-171315
Active Directory	2.1.0-20201112-223323
Boolean	2.1.0-20201126-165109
Browser	2.3.0-20201211-222811
Clipboard	2.1.0-20201126-165124
Comment	2.3.0-20201126-165125
CSV/TXT	2.3.0-20201126-165126
Database	2.2.0-20201112-223343
Data Table	2.5.0-20201201-130615
Datetime	2.2.0-20201126-165136
Delay	2.2.0-20201126-165137
Dictionary	3.2.0-20201126-165138
Run DLL	3.3.0-20201126-165850
Email	3.2.0-20201120-062604
Error handler	2.3.0-20201126-165148
Excel basic	2.4.0-20201126-165604
Excel advanced	5.3.0-20201208-090251
File	3.2.0-20201126-165151
Folder	3.1.0-20201126-165154
FTP / SFTP	2.2.0-20201115-072759
Image Recognition	2.2.0-20201117-081754
JavaScript	2.4.0-20201126-165412
Simulate keystrokes	2.5.0-20201112-223902

Package	Version
Legacy Automation	3.2.0-20201124-064544
	1.5.0-20201125-004358
List	2.2.0-20201126-165427
Log To File	2.2.0-20201126-165428
Loop	2.1.0-20201126-165429
Message Box	2.1.0-20201126-165430
Mouse	2.2.0-20201112-223917
Number	2.1.0-20201126-165444
OCR	2.3.0-20201126-081210
Office 365 Excel	2.2.0-20201104-062559
Office 365 Calendar	2.1.0-20201111-162101
Office 365 OneDrive	2.2.0-20201126-165550
PDF	2.6.0-20201126-165555
PGP	2.2.0-20201126-165557
Ping	2.1.0-20201126-165559
Play Sound	2.1.0-20201127-115706
Prompt	2.2.0-20201109-192507
Python Script	2.4.0-20201208-064944
Recorder	2.10-20201215-211402
REST Web Service	3.2.0-20201112-224735
SAP	2.2.0-20201126-165852
Screen	2.2.0-20201126-165855
SNMP	2.1.0-20201126-165859
SOAP Web Service	3.2.0-20201123-093411
String	3.1.0-20201126-165909
System	3.0.0-20200921-090225
Terminal Emulator	3.6.0-20201213-084139
VBScript	2.4.0-20201208-065526
Wait	3.1.0-20201126-165922
Window	2.3.0-20201123-093430
Workload	2.1.0-20200825-071644
XML	2.1.0-20201126-165927

# Community Edition A2019.17 Release Notes

*Release date: 13 November 2020*

Review the new features and supported packages in the Community Edition A2019.17 (Build 7103) release. IQ Bot is on Build 7082.

- [Community Edition A2019](#)
- [AARI](#)
- [IQ Bot](#)
- [Bot Insight](#)
- [Supported packages](#)

## Community Edition A2019

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

New features
<p><b>Connect to EWS server with OAuth authentication</b></p> <p>A new authentication is available for the Exchange Web Services (EWS) protocol with OAuth. You can use the OAuth authentication and enable your EWS-managed API applications to access Exchange online in Office 365.</p> <p><a href="#">Using the Connect action</a></p>
<p><b>VT220 terminal type supported in Terminal Emulator</b></p> <p>To establish a connection and communicate with another machine, you can now use the VT220 terminal for sending and receiving text.</p> <p><a href="#">Using the Connect action</a></p>
<p><b>Enhancements to the Recorder</b></p> <ul style="list-style-type: none"> <li>• Record a task using the Universal Recorder or AISense Recorder from a single point of entry. Both recorders are now managed through a single package, which enables faster and more efficient updates.</li> <li>• You can now record tasks in a Microsoft Edge browser that runs on Chromium (versions 79 and later).</li> <li>• Use the AISense Recorder <b>Define</b> option to capture an object that is only visible when you hover the mouse over the object.</li> <li>• Use the <b>Resize window</b> option in the <b>Recorder</b> &gt; <b>Capture</b> action to set the window width and height.</li> </ul> <p>This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, thus increasing the likelihood that the bot identifies the target object.</p> <p><a href="#">Get started with recorders</a>   <a href="#">Universal Recorder supported applications and browsers</a>   <a href="#">Using the Capture action</a></p>

New features
<p><b>Use shared session in Terminal Emulator</b></p> <p>Use the new <b>Shared session</b> option to pass the exact state of an application to a concurrently occurring TaskBot or MetaBot logic. For example, instead of connecting to the same application multiple times for different tasks, you can use the option to connect to the application using a single task, thus optimizing your automation logic in the long run.</p> <p><a href="#">Share session between TaskBot logic</a></p>
<p><b>Share an Excel session between bots</b></p> <p>Use the <b>Set session</b> action from the Excel basic or Excel advanced package to assign an Excel session to a variable, and then pass that variable from a parent to a child bot. This enables the child bot to access the worksheet opened in the parent bot.</p> <p><a href="#">Excel basic package</a>   <a href="#">Excel advanced workbook operations</a>   <a href="#">Example of sharing an Excel session between bots</a></p>
<p><b>New option for Run Task</b></p> <p>In the Task Bot package, you can now use the <b>Run</b> action with an option to repeat the selected task until you choose to stop it.</p>
<p><b>New search for roles in User Management API</b></p> <p>Use the new <code>Search for roles</code> API in the User Management APIs in Swagger to obtain a list of all the roles or details for a specific role.</p> <p><a href="#">Search for roles API</a></p>
<p><b>Capture response status of REST API</b></p> <p>In the REST Web Service package, you can capture the response status of the REST API in the dictionary variable. The dictionary variable now shows the response key with its value.</p>
<p><b>New option for REST Web Service</b> (Service Cloud case ID: 00489741, 00646436)</p> <p>Use the <b>Capture failure response</b> action in the REST Web Service package to capture response details in the response body.</p>

## New features

### Use regular expressions in packages

You can use regular expressions (regex) in certain actions to support pattern-based search in a file, folder, or Windows title. Regular expressions are supported in the actions of the File and File and Folder packages such as **Copy**, **Delete**, **Rename**, **Print Multiple files**, and **Zip**.

You can also use regular expressions in some packages that support the wildcard character in their window titles.

The following packages and actions support regular expressions:

- Wait
- Image Recognition
- Simulate keystrokes
- Mouse > **Click** action
- Legacy Automation > **Manage windows control**
- OCR
- Screen
- Recorder > **Capture**
- Run DLL > **Run function (Legacy)**, **Run function**
- Window: **Activate**, **Close**, **Maximize**, **Minimize**, **Resize**

[Using Copy action for file](#) | [Using the Capture action](#)

### Support for overloaded functions in DLL package

The **DLL > Run function** action can now handle `.dll` files that contain multiple functions of the same name. The action calls the function based on the number of parameters passed.

[Using the Run function action](#)

### New actions for SAP captured objects

Use new actions that are available for **Tree**, **Tab**, and **Label** controls to perform operations for the various objects captured from an SAP application.

[Actions supported in various SAP versions](#)

### Store multiple lines of text in a string variable

You can use a string variable containing multiple lines of text in the following actions:

- **String > Assign**
- **String > Extract text**
- **String > Compare**
- **String > Lowercase**
- **String > Replace**
- **String > Reverse**
- **Log to file**
- **Message box**
- The string condition in the **If**, **Wait**, and **While** actions

**New features****Arabic, Japanese, and Russian characters supported in variable names**

You can now create variables with names containing Arabic or Russian characters, or Japanese double-byte numbers.

[Unicode range supported in variables](#)

## Automation Anywhere Robotic Interface (AARI)

**New features****View previous selected tasks**

AARI users can now reference selected actions of their tasks. When they view a submitted task in request view, a check mark indicator is now displayed next to the buttons that are selected.

**Run a process in private workspace**

You can now run a process in your private workspace by using the **Run** option in the process editor. The bots in the process are then executed on the default device of the Bot Creator.

[Configure processes](#)

**Use variables types**

You can now use new variables in the process editor such as **createdOn** and **updatedOn** (DateTime), **id** (Number), and **title** (String). These variables are part of a data flow (workflow engine) that moves data between each step of a process and requires variable input for the process to run properly.

[AARI variable types](#)

**Use the Data Privacy tag field**

The **Data Privacy tag** enables users to generate hidden custom output in their process tasks (**Start** panel, **Human Task**, and **Bot Task**). Users can enter the variables for this field during runtime with values. In the web portal, the AARI admin can use this tag to check for requests or tasks by using personal user data. The admin can also filter using this field.

[Create an AARI process](#) | [Filter and search for a request](#) | [Filter and search for a task](#)

## IQ Bot

New features	
<p><b>Support for Arabic language</b></p> <p>When creating a learning instance, you can now choose the Arabic language from the <b>Primary language of documents</b> drop-down menu, with the following limitations:</p> <ul style="list-style-type: none"> <li>• Advance table extraction is not available.</li> <li>• Search field on the <i>Validator</i> is not supported.</li> <li>• Arabic numerals are not supported.</li> </ul> <p>For example, if the document has date or time in Arabic language, it is extracted as text and validations can fail.</p> <hr/> <p><b>Note:</b> You can still use string-based validation checks (such as regular expressions) for Arabic numerals.</p> <hr/> <ul style="list-style-type: none"> <li>• Arabic is only supported on ABBYY FineReader Engine 12.4.</li> </ul> <p><i>Creating a learning instance</i></p>	
<p><b>Default validations for a group</b></p> <p>When editing a learning instance, you can now use the <b>Select the default validations group</b> drop-down menu to select an available group. This allows all the new group documents in production to be extracted based on the custom logic and validations defined in this selected group, before it goes to the Validator.</p> <p><i>Edit a learning instance</i></p>	

Fixed features	
Service Cloud case ID	Description
-	You can now create and edit a bot even if a document associated with a deleted bot appears in production. Previously, if a bot was deleted and a document associated with it appeared in production, you could not create a new bot.

## Bot Insight

New features
<p><b>New AARI dashboard in Bot Insight</b></p> <p>Use the AARI dashboard to view various widgets that provide information about requests created from published processes in AARI. The dashboard also provides statistics on the status of created requests.</p> <p><i>AARI dashboard</i></p>

## Supported packages

Package	Version
Application	2.1.0-20200921-085720
App Integration	1.1.0-20201014-042506
Analyze	2.2.4-20200903-113949
Active Directory	2.1.0-20200921-085716
Boolean	2.1.0-20201014-042509
Bot Migration	2.5.0-20200902-045043
Browser	2.1.0-20201002-123733
Clipboard	2.1.0-20201014-042520
Comment	2.2.0-20201014-042520
CSV/TXT	2.3.0-20201014-082525
Database	2.2.0-20201013-052941
Data Table	2.3.0-20201030-143334
Datetime	2.2.0-20201014-042531
Delay	2.2.0-20201014-042532
Dictionary	3.2.0-20201014-042532
Run DLL	3.2.0-20201105-205159
Email	3.1.0-20201104-062204
Error handler	2.2.0-20201014-042541
Excel basic	2.3.0-20201027-160012
Excel advanced	5.1.0-20201027-155758
File	3.1.0-20201016-065515
File & folders	1.1.0-20201023-202725
Folder	3.0.0-20201016-065517
FTP / SFTP	2.1.0-20200921-085757
IF/ELSE	2.1.0-20200921-085758
Image Recognition	2.1.0-20201014-042552
Interactive forms	2.17.3-20201102-103733
IQ Bot	2.1.0-20201013-095304
JavaScript	2.3.0-20201104-062431
Simulate keystrokes	2.4.0-20201021-163833
Legacy Automation	3.2.0-20201104-062439 1.3.0-20201105-151906

Package	Version
List	2.2.0-20201014-042806
Log To File	2.2.0-20201014-042806
Loop	2.1.0-20201014-042808
Message Box	2.1.0-20201014-042808
Migration	2.7.0-20201106-072418
Mouse	2.1.0-20201014-042814
Number	2.1.0-20201014-042823
OCR	2.2.0-20201104-062503
Office 365 Excel	2.2.0-20201104-062559
Office 365 Calendar	2.1.0-20200921-085726
Office 365 OneDrive	2.1.0-20201014-042924
PDF	2.5.0-20201014-042929
PGP	2.2.0-20201014-042931
Ping	2.1.0-20201014-042932
Printer	2.1.0-20200921-090131
Play Sound	2.1.0-20200921-090123
Prompt	2.1.0-20200918-081201
Python Script	2.3.0-20201105-204912
Recorder	2.0.9-20201105-164103
REST Web Service	3.1.0-20200928-231420
SAP	2.2.0-20200921-090209
Screen	2.1.0-20201014-043037
SNMP	2.1.0-20201014-043041
Service	3.0.0-20200921-090214
SOAP Web Service	3.1.0-20200921-090219
String	3.1.0-20201014-043052
System	3.0.0-20200921-090225
Task	2.0.1-20201023-202703
Terminal Emulator	3.4.0-20201028-021451
Trigger Email	1.1.0-20201105-152220
VBScript	2.3.0-20201105-205228
Wait	3.1.0-20201014-043117
Window	2.2.0-20201022-121649
Workload	2.3.0-20201105-205233

Package	Version
XML	2.1.0-20201014-043121

## Automation 360 v.21 Cloud Preview Sandbox Release Notes

*Release date: 02 June 2021*

---

**Important:** The cloud preview sandbox environment is for Automation 360 Cloud customers only.

---

The cloud preview sandbox environment enables you to test your production bots to ensure they work seamlessly in the production environment. Use the sandbox environment to plan and test new features for upcoming Automation 360 releases.

---

**Note:** For information about supported packages, see [Viewing package versions available in the Control Room](#).

---

- [RPA Workspace](#)
- [AARI](#)
- [Discovery Bot](#)

### RPA Workspace

---

**Bot agent update:** This release includes a required update to your . Ensure that you complete the update to continue with your automation activities when upgrading from a previous release to this release.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

---

To verify which version is compatible with this release, see [Compatibility with Automation 360 builds](#).

What's new
<p><b>Automation 360 navigation enhancements</b></p> <p>We have enhanced the overall readability and accessibility of the Automation 360 interface. To make navigation easier, menus and views are organized based on frequently used features and related tasks.</p> <p>The interface includes the following updates:</p> <ul style="list-style-type: none"> <li>• The Device, Profile, and Help icons are now located at the bottom of the navigation menu, consolidating all controls on the left for easy access. <ul style="list-style-type: none"> <li>When you click these icons, flyout panels of content and actions are shown.</li> </ul> </li> <li>• The side navigation menu can be collapsed to a slim bar to maximize the main workspace area. <ul style="list-style-type: none"> <li>You can continue to use the side navigation in collapsed mode, with flyouts for each section.</li> </ul> </li> </ul> <p><a href="#">Automation 360 navigation updates</a></p>

What's new
<p><b>Authenticate database connection with Microsoft Azure Active Directory credentials</b> (Service Cloud case ID 00676448)</p> <p>You can now authenticate the Control Room database connection using Microsoft Azure Active Directory credentials when you install the Control Room on Microsoft Azure.</p> <p><a href="#">Configure database type and server</a></p>
<p><b>Prioritize your automations</b></p> <p>Set priority on your automation and deployments to meet your business SLA and to optimally use your resources. You can set the preference when you create, edit, and schedule bots so that higher priority automations are deployed first. To run and schedule automations, you must be assigned the permission <b>Set automation priority to high</b> by the Control Room admin.</p> <p><a href="#">Feature permissions for a role</a>   <a href="#">Set automation priority for your bots</a>   <a href="#">Schedule a bot</a></p>
<p><b>Deploy workload automation on a multi-user Windows terminal server</b></p> <p>To optimize workload automation and multi-user devices, you can deploy workload automations on a multi-user Windows terminal server so that a single device can process multiple work items concurrently.</p> <p><a href="#">About multi-user devices</a>   <a href="#">About device pools</a></p>
<p><b>Control Room and Bot agent compatibility checks for automation</b></p> <p>To manage the lifecycle of your automation, you can view dependency information about minimum compatible Control Room and Bot agent versions when you create and deploy automations. You can then update your automation and reduce runtime errors caused by an incompatible Control Room or Bot agent version.</p> <p><a href="#">Actions palette content for bot creation</a></p>
<p><b>New actions in the SAP BAPI package</b></p> <p>Use the following new actions:</p> <ul style="list-style-type: none"> <li>• <b>Run standard workflow:</b> Runs a standard workflow in SAP BAPI.</li> <li>• <b>Run custom workflow:</b> Runs a custom workflow in SAP BAPI.</li> </ul> <p><a href="#">SAP BAPI package</a></p>
<p><b>New actions in File package</b></p> <p>Use the following new actions:</p> <ul style="list-style-type: none"> <li>• <b>Get name:</b> Reads a file name and stores it to a string.</li> <li>• <b>Get path:</b> Reads the path of the file and stores it to a string.</li> </ul> <p><a href="#">File package</a></p>
<p><b>Common table expression supported in Database package</b></p> <p>You can now use common table expression (CTE) in the <b>Read from</b> action using the <code>WITH</code> keyword in SQL-compliant databases such as Oracle and MySQL. Use CTE statements within a SQL query to simplify complex joins and subqueries.</p> <p><a href="#">Using the Read from action</a></p>

What's new
<p><b>Support for large numbers in Number package</b> (Service Cloud case ID:00557619)</p> <p>You can now perform mathematical operations for large numbers with more precision in the Number package.</p> <p><a href="#">Number package</a></p>
<p><b>Snowflake database support using ODBC driver</b> (Service Cloud case ID:00761695)</p> <p>Snowflake ODBC driver is now supported in the Database package. You can connect to the Snowflake database using ODBC-based client applications.</p> <p>The following actions support this feature:</p> <ul style="list-style-type: none"> <li>• Connect</li> <li>• Disconnect</li> <li>• Read from</li> <li>• Export to data table</li> <li>• Insert/Update/Delete</li> </ul>
<p><b>Variables: new features and enhancements</b> (Service Cloud Case ID:00740585)</p> <ul style="list-style-type: none"> <li>• Edit the variable name after the variable is created.</li> <li>• Delete all or a specific selection of unused variables from a bot.</li> </ul>
<p><b>Universal Recorder new features and enhancements</b></p> <ul style="list-style-type: none"> <li>• Record object interactions in applications built on the Electron framework.</li> <li>• Perform double-click in all supported applications and browsers.</li> </ul>
<p><b>Limit credential attribute use to password fields only</b> (Service Cloud Case ID:00740585)</p> <p>When you create or edit a credential attribute, ensure that bots input the attribute value only in fields that are identified as password fields by selecting the <b>Set this attribute as a password</b> option.</p>
<p><b>Organize device pools to check for available devices in a preferred order</b></p> <p>If you select multiple device pools (either in the <b>Run now</b> or <b>Schedule</b> window), you can now arrange the device pools in the order of preference. When a bot is deployed, the Control Room selects the first available device based on the order in which you organized the device pools. If none of the devices are available at the time of deployment, the bot is queued.</p>
<p><b>Default names for output variables</b></p> <p>When you configure an output variable for the actions in the Error handler and Python Script packages, the Control Room automatically generates a descriptive default variable name. If you create more than one output variable for an action, the subsequent variable names are appended with a -1, -2, -3, and so on to avoid a variable name conflict.</p>
<p><b>New string action to support nested variables</b></p> <p>Use the <b>String &gt; Evaluate value</b> action to compare a user-specified string variable with the string variables in the bot. If a match is found, the action returns the value of the matching variable.</p> <p><a href="#">String package</a></p>

<b>What's new</b>
<p><b>Delete Global values</b></p> <p>A user with the <b>AAE_Admin</b> role can delete a global value from the <b>All global values</b> page.</p> <p><a href="#">Global values</a></p>
<p><b>High availability support</b></p> <p>For Cloud-enabled users, high availability is supported through three-node deployments.</p>
<p><b>String package enhancement</b></p> <p>A new option to support local numbering styles is now available in the String package. You can now select your local format, represented by ISO-3166.</p>
<p><b>Dependent files and package information in Export package audit details</b></p> <p>In the Audit details of an exported package, you can now view the list of dependent files and packages associated with the exported package. This feature enables you to analyze what the exported package contains and identify any discrepancies. If you chose to include packages during an export, then only the package information is included in the audit details.</p>
<p><b>ODBC driver support for all connection strings</b> (Service Cloud Case ID: 00748887, 00777676)</p> <p>An Open Database Connectivity (ODBC) driver is now available to support all the ODBC connection strings in the same way it was used in the Enterprise 11.x version. Using SQL as a standard for accessing and managing data, you can connect to MySQL, Google BigQuery, Snowflake, and other databases using the ODBC driver.</p>
<p><b>Share a DLL session</b></p> <p>You can now share a DLL session between bots.</p>
<p><b>New CredentialAllowPassword annotation</b></p> <p>Use the new <b>CredentialAllowPassword</b> annotation in the package SDK to allow the selection of a credential attribute marked as a password. You can use this annotation when creating a new SDK package or when modifying an existing one.</p> <p><a href="#">Configure and use credential allow password annotation</a></p>
<p><b>Enhancements to check-in, check-out, and cloning permissions</b> (Service Cloud Case ID: 00645904, 00720237, 00752197, 00760306, 00764684)</p> <ul style="list-style-type: none"> <li>• When performing a check-in, you can now choose the dependencies to check in along with the bot. Directly referenced dependencies will be automatically checked in with the bot.</li> <li>• When a bot is checked in along with a cloned bot and there are no other bots dependent on the clone, the cloned bot is now deleted.</li> <li>• When performing a check-out, you can now choose the dependencies you want to check out with the bot. The dependencies that are not selected during the check-out are now cloned.</li> <li>• During check-out, you can now overwrite or replace a cloned bot.</li> </ul>
<p><b>Bot agent installer includes shortcut for AARI Assistant</b></p> <p>A shortcut to access AARI Assistant easily is added on the desktop and Windows menu when you install a Bot agent.</p> <p><a href="#">Install Bot agent and register device</a></p>

What's changed
<p><b>Bot Scanner shows invalid bots in "cannot be migrated" list</b></p> <p>The Bot Scanner is updated to show invalid bots as blocked from migration because these invalid bots were failing before and after migration. For example, 11.x or 10.x bots that referenced non-existent variables failed. So some bots will no longer be shown in the <b>can be migrated</b> list of bots but will instead be shown in the <b>cannot be migrated</b> list in the output report. This can decrease the number of bots that can be migrated to Automation 360.</p>
<p><b>Change in names of file locations and folders</b></p> <p>File locations and folder names are now updated for the change in product name (from Enterprise A2019 to Automation 360). For example, the file location for the default installation path is changed from C:\Program Files\Automation Anywhere\Enterprise\ to C:\Program Files\Automation Anywhere\Automation360. We will be updating these locations and names on our documentation pages soon.</p>
<p><b>Source string is optional in Split action</b> (Service Cloud case ID: 000687257, 00702258)</p> <p>In bots (including bots migrated from 11.x), when you use the <b>Split</b> action in the String package, the <b>Source string</b> field is now optional. You can run the bot without providing a source string value. Migrated bots that contain empty input strings now execute successfully.</p>
<p><b>Mandatory prerequisites validation before migrating bot</b></p> <p>When you migrate bots using the <b>Migrate bots</b> option in the Bot Migration Wizard, a prerequisite validation message appears with a checklist of all the validation items. The system now validates these prerequisites automatically to ensure that all prerequisites are met before you start the bot migration. Previously, validating prerequisites was optional.</p> <p>If the prerequisite validations are completed with a failure, a validation report appears with the list of items for which validation failed. If the prerequisite validations are completed without any failure, the bot migration is started.</p>
<p><b>Change in default Control Room database name</b></p> <p>The default Control Room database name is now changed from <i>AAE-Database</i> to <i>Automation360-Database</i>.</p> <p>If you are upgrading from an earlier release to this release, enter your existing Control Room database name to preserve your data.</p>
<p><b>Microsoft SQL Server clustering for high availability</b></p> <p>You can now use Microsoft SQL Server clustering for automatic and graceful failover of high availability deployments in Control Room clusters.</p> <p><a href="#">Database requirements</a></p>
<p><b>Bot agent nickname is hidden</b></p> <p>The nickname of a Bot agent (added during installation) is now hidden when you switch the registration of a user device from one Control Room instance to another.</p>
<p><b>User interface change in the Open action of Excel packages</b></p> <p>In the Excel basic and Excel advanced packages, the <b>Sheet contains header</b> check box now appears below the <b>Select file</b> field.</p>

What's changed
<p><b>User interface change in the Variables palette</b></p> <ul style="list-style-type: none"> <li>The <b>User-defined</b> variables list is now named <b>Your variables</b></li> <li>System, String, and Clipboard variables are organized within <b>Predefined variables</b></li> </ul>
<p><b>Digits with comma considered a valid number</b> (Service Cloud case ID: 00623458)</p> <p>In migrated bots, a set of digits that uses a comma is now considered a valid number. This change enables you to successfully verify mathematical operations and If, ElseIf, and Loop variable conditions containing various operators.</p>
<p><b>Date comparison works with dates in different formats</b> (Service Cloud case ID: 00723479)</p> <p>Date condition actions are now successfully migrated to the equivalent date conditions in On-Premises. The date condition now works with multiple subformats of the main format (MM/dd/yyyy). Therefore, you do not have to manually change the date format per the source format of the migrated bots that contain date strings.</p>
<p><b>Use string value with numeric operators</b></p> <p>Migrated bots that contain If or While actions that use string values or a variable containing a string value with &lt;, &lt;=, &gt;, and &gt;= numeric operators now run successfully.</p>
<p><b>Enhancement to Extract field action in PDF package</b></p> <p>Use the <b>PDF viewer</b> in the <b>Extract field</b> action to extract all the form field data and selected text, and store the form data to variables.</p> <p><i>Using the Extract field action</i></p>
<p><b>Connect automatically to SQL server for Windows authentication</b> (Service Cloud case ID: 00691554)</p> <p>When you upgrade the Bot agent, you no longer have to add <code>d11</code> files manually to connect to the Microsoft SQL Server using Windows authentication.</p> <p>Previously, users had to manually add <code>d11</code> files to configure devices and use the Connect action from the Database package to connect to the Microsoft SQL Server with Windows NT authentication.</p>
<p><b>Enhancement to Active Directory mapping</b></p> <p>You can now create AD groups using commas in the naming on the AD server side and the Control Room side. Previously, this caused an error.</p>
<p><b>Enhancement to the Split action of String package</b></p> <p>Migrated bots now run successfully when the <b>Split</b> action is used to split a string available in an input variable and that variable is empty.</p>

The following table lists the fixes and the builds in which they were fixed. Build 9637 is the latest build for Cloud and includes fixes from the previous builds. On-Premises is on Build 9642.

Fixes		
Build	Service Cloud case ID	Description
9642		Control Room instances configured with Active Directory for authentication with the retrieval of credentials from an external key vault were unsuccessful due to incorrectly prepending domain names in object names (CyberArk) and secret names (AWS) and caused authentication to fail. This issue is now fixed and object names (CyberArk) and secret names (AWS) are now properly formatted.
9637	00784333, 00784890, 00784382, 00784338	Bot deployments are no longer stuck in a queue after Automation 360 Cloud is updated from the previous release to this release.
9637	00780756	You can now check in bots that have a shared dependency with other bots successfully. Previously, check-in failed because of an issue with the cloned bots losing the dependency during check-in, irrespective of their existing parent bots.
9595	00733638, 00756399	Bots that use a variable to specify the child bot to run no longer encounter an error because the variablized path contains a backslash.
9595	00711390	The retry mechanism now enables you to migrate large .atmx files. Previously, when a large .atmx file was migrated, the connection with the Control Room became stale or unauthenticated, resulting in a <code>NoHttpResponseException</code> error. With the retry mechanism, the Migration utility attempts to build a connection with the Control Room 5 times until the connection is successfully rebuilt.

Fixes		
Build	Service Cloud case ID	Description
9595	00730369, 00747866	Recorder actions now work properly, which enable you to run the migrated bot without any delay. Previously, it took a longer time to run the bot due to a long delay.
9595	00733383, 00754559	The Loop counter variable now works properly for migrated bots. The variable is now migrated as part of the <b>XML</b> and the <b>Data Table</b> commands.
9595	--	When updating the SQL queries on a migrated bot using the <b>Read from</b> and the <b>Insert/Update/Delete</b> actions of the Database package, the existing format of the query is no longer automatically modified. Previously, when editing the SQL queries on a migrated bot, the characters were being misplaced.
9595	00721238	You can now use the <b>Browser</b> action to access a URL with parameters using the Microsoft Edge browser. Previously, when a URL with parameters through the <b>Browser</b> action was accessed using Microsoft Edge, the URL parameters were truncated from the & (ampersand) character after the bot was run.
9595	00721488	11.x bots that use the <b>Get multiple nodes</b> command no longer provide a different output after migration. Previously, the migrated bot returned output per the structure of the XML file, while the 11.x bot provided output in a single line.

Fixes		
Build	Service Cloud case ID	Description
9595	--	You no longer encounter an issue when you run bots migrated from 11.x that use identical names for variables differentiated by a hyphen or an underscore (for example, L-Lower and L_Lower). The variable name that contains a hyphen is now appended with some keywords (for example, variable Arr-val is updated to Arr-val-MIG-SPL-25). Previously, bots failed to execute after migration.
9595	00729931	After migration, when the bot file is generated, the correct DOMXPath is now migrated. Previously, an incorrect DOMXPath was migrated.
9595	00738643	The If and Loop conditions when used in a combination of multiple <b>AND</b> or <b>OR</b> conditions now works properly. Previously, using the If and the Loop conditions with multiple conditions resulted in a bot logic error.
9595	00743808, 00754554	Migrated bots that use the If command with a variable in the HH:MM format now work properly and no longer encounter any issue.
9595	00678059	You can now download exported packages if the bot name contains Japanese characters and an underscore (_). Previously, if the name contained such characters, an unexpected error occurred that restricted the user from downloading the package.
9595	--	When you run a migrated bot that contains the <b>Excel Advanced &gt; Find</b> action, the found cell is now active and subsequent actions can perform operations on that active cell.

Fixes		
Build	Service Cloud case ID	Description
9595	00731512	You can no longer edit a bot and change the bot repository file path from the public to private folder by updating the Control Room URL and repository path in the browser.
9595	00734059	INFO type messages are no longer duplicated in the Control Room <code>WebCR.log</code> file.
9595	--	When you install a Bot agent at the user level, the user device is now registered as admin.
9595	00744663, 00747831, 00737488, 00752613	You can now successfully export a bot that contains the Recorder package.
9595	00726433	Fixed an issue with Microsoft Graph APIs that caused errors when a bot downloaded files from OneDrive. Bots can now successfully run the <b>Office 365 OneDrive &gt; Download file</b> action.
9595	00703553	When a new user is created, the Audit API now returns the correct values for the <b>eventDescription</b> and <b>userName</b> parameters.
9595	00729563	The <code>atmx</code> file extension is no longer case-sensitive. You can now migrate tasks that include uppercase or lowercase letters in their file extensions. Previously, tasks with uppercase letters in their file extensions were not migrated by the Bot Migration Wizard.
9595	00740548	Bot status is now correctly displayed after a process is executed. Previously, scheduled bots were occasionally mislabeled as <code>In progress activity</code> even though the bot had completed the process.
9595	00731508	You can now enter Nordic characters in the credential attribute and credential variable values.

Fixes		
Build	Service Cloud case ID	Description
9595	00695176, 00692676	Newly copied bots containing an event trigger now run when the triggering event occurs.
9595	00759742	When you insert a variable in a text string, the variable is now inserted at the cursor position. Previously, the variable was inserted at the end of the string and not at the cursor position.
9595	--	You can now successfully deploy bots from the Bot editor. Previously, when the Bot Creator or Bot Runner (attended or unattended) user logged in to the Control Room and if the package download option was enabled, the package download took priority and bot deployment had to wait until the package download was completed.
9595	00730211	When you use the Recorder package > <b>Get property</b> action to extract the path property of the object, the recorder now retrieves the value of the height and path attributes of the captured object. Previously, the height and path attributes of the recorded object were not retrieved by the bot.
9595	00716793	An issue is no longer encountered when you execute a bot using the SOAP Web Service package with unformatted input parameters. Previously, bot execution failed with an error because the unformatted input parameters were not formatted in XML format by the bot.
9595	00706709	In the Email package, when you use the Outlook connection to retrieve emails with the date filter, all emails are now retrieved correctly. Previously, all the emails were not retrieved from the application when the date filter was applied.

Fixes		
Build	Service Cloud case ID	Description
9595	00714292	To support double backslashes (\\) in the file location for actions that use file input, you must now set the <b>Bot compatibility version</b> as 2 in the <b>Advanced settings</b> page of the Bot editor. Previously, the bot execution failed because the double backslash (\\) in the file location was replaced with a forward slash when you select a network path using <b>Browse</b> option.
9595	00697460	When you select the recorder in the If condition, the recorder now locates the object in the Oracle EBS application and captures the correct object properties without any error. Previously, the recorder failed to find the object when captured in the If condition.
9595	--	In Microsoft Edge or Firefox, when a bot opens a website inside a loop, the Recorder <b>Capture</b> action now works properly after the launch website operation is executed. Previously, the action failed after launch website was executed.
9595	00710257	In the Recorder package, the <b>Capture</b> action now works without encountering any issues. Previously, the Recorder failed with a timeout error because the network proxy details were not retrieved.
9595	00735480	A TaskBot now performs better when you use the <b>Loop</b> action to execute a bot. Previously, the TaskBot took a long time to complete execution.

Fixes		
Build	Service Cloud case ID	Description
9595	00559868	When you use Datetime package > <b>Assign</b> action to convert a DateTime variable using the custom format dd- <b>MMM</b> -yyyy, the bot now executes without any errors. Previously, the bot execution failed due to case-sensitive characters in the DateTime format.
9595	--	Migration of PaaS database (Azure SQL) connection strings by using an ODBC driver is now supported.
9595	00733651	You can now view the average time spent to create a TaskBot metric in the Control Room on different pages when you click a page number.
9595	00742305	When you turn off one node on a three-node cluster and log in to the Control Room, the following error is no longer displayed: <code>Cluster group is empty.</code>
9595	00712190, 00698197, 00700574	When you deploy a bot with string values that exceed the allowed limit of 2 - 4 MB, the Control Room recognizes it as an exception and now shows the following error message: <code>400 Bad Request.</code>
9595	00754585, 00755448	When you run a bot, dependencies including the child bots are now downloaded. The bot no longer shows an unknown status and session as expired.
9595	--	When you now migrate the Database command, no additional configuration is required.
9595	00745046	You can now check in your bots without encountering any issues. Previously, bot check-in failed because the Git repository was corrupted intermittently.

Fixes		
Build	Service Cloud case ID	Description
9595	00677638	When you add a user device as the default device in the Control Room, the <b>Devices</b> page now automatically displays it as the default device. You no longer have to re-log in to the Control Room or refresh the Control Room page.
9595	00733370	Users signed in to temporary (non-persistent) shared devices can now sign in to the Control Room after a previous session on the temporary device is deleted by the Control Room administrator.
9595	00736950	MetaBots using Japanese characters (double-byte string) as the output variable can now be successfully saved and executed after the MetaBots are migrated to On-Premises using the migration wizard.
9595	00723924	The Terminal Emulator type ANSI now accepts a password that contains braces or {}. Previously, when braces were used in the password, an invalid username and password error message was shown in the terminal screen.

Limitations
<p><b>Known behavior for configured ports on multiple instances</b></p> <p>When you install the Control Room and configure the database, the corresponding configured ports for multiple instances should match. For example, for first instance the configured port is 1434 and for second instance the configured port is 1435, ensure you add 1434 as port for first instance and 1435 as port for second instance.</p>

Limitations
<p>The Universal Recorder has the following limitations when capturing objects in Electron apps:</p> <ul style="list-style-type: none"> <li>The <b>Check</b> action in a check box is not currently supported. <b>Workaround:</b> Use <b>Toggle</b>, <b>Click</b>, or <b>Left click</b> instead.</li> <li>The Universal Recorder cannot capture tabular data. <b>Workaround:</b> When the Universal Recorder captures an object control of <code>Client</code>, select the <b>GetAllChildrenNames</b> action and store the data to a list variable.</li> <li>The Universal Recorder might capture the window containing Microsoft Teams as a Client technology, instead of the intended object. <b>Workaround:</b> Close and reopen Microsoft Teams.</li> <li>The Universal Recorder only supports object capture from Electron apps in a computer that has the display scale configured to 100% or has a DPI awareness setting.</li> </ul>
<p>If the maximum number of allowed activeMQ connections is exceeded, an AMQ failure can occur when running a RunTask automation that is looped 5 times, with each loop running 20+ bots after the fourth loop.</p>
<p><b>External key vault</b></p> <p>The Create/Edit User configure options still include the field permitting the administrator to enter the device credentials for the user. When auto-login is configured for the external key vault, these fields are still viewable and appear editable; however, the credentials added have no effect on the auto-login credential retrieval from the external vault.</p>

## AARI

What's new
<p><b>AARI Assistant for attended Bot Runners</b></p> <p>The AARI Assistant application enables users with the attended Bot Runner license to access their bots without logging in to the Control Room. AARI web users can use the AARI Assistant when the attended Bot Runner license is enabled along with their AARI User license without impacting their existing functionality.</p> <p><a href="#">About AARI Assistant</a></p>
<p><b>Download, delete, or view files in browser in initial forms or tasks</b></p> <p>Users can now use the <b>Select File</b> element to download files that are uploaded to the initial forms or tasks, and they can also delete files or access the hyperlink file to view the file in within the browser. The uploaded file can be accessed as a hyperlink, and new icons are available for download and delete.</p>

What's new
<p><b>Enhancement to team roles</b></p> <p>The AARI team consists of three roles:</p> <ul style="list-style-type: none"> <li>• Member: Can create, view, and delete their own requests. All the tasks are automatically assigned to the member when they create the request in a private team. In a shared team, the member can assign tasks to other members.</li> <li>• Owner: Can create, view, delete, and assign all the requests from the members in the team.</li> <li>• Admin: Can create, view delete, and assign all the requests from the members in the team. The admin can also modify the team.</li> </ul> <p>An AARI admin or manager can edit their teams and update their team members' roles. They also have the option to add or remove team members. The AARI manager is the team admin by default when they create a team.</p>
<p><b>Enhancement to creating requests</b></p> <p>A request can now be created either by a user or by a bot in the <b>Edit Process</b> page.</p> <ul style="list-style-type: none"> <li>• Choose the <b>by user</b> option to view the process in the <b>Processes</b> page.</li> <li>• Choose the <b>by bot</b> option so that the request is created either by a bot or by another process using the <b>Process Task</b>.</li> </ul> <p>You cannot view the process or create a request with this option. Because the request is created from within a team, specify the default team in the <b>Default team to take the bot created request</b> field in the <b>Edit Process</b> page.</p> <p><i><a href="#">Assign an AARI team to a process</a></i></p>
<p><b>Assign to me feature in tasks</b></p> <p>When a task is unassigned and users access the tasks, use the <b>Assign to me</b> option to allow the tasks to be assigned to the current user so that they can immediately access the form.</p> <p><i><a href="#">Assign or unassign a task</a></i></p>
<p><b>New Bot page</b></p> <p>When AARI team members with attended Bot Runner licenses access the web interface, they are automatically redirected to AARI Assistant. Users can view all the bots created by them on this page. They can also pin, search, and sort their assigned bots.</p>
<p><b>New team reference in Request and Process pages</b></p> <p>The user can now reference the team from which a request is created by referring to the new <b>Team</b> column in the <b>Request</b> page or the team name added in the process tile in the <b>Process</b> page, to help guide their team assignment.</p>
<p><b>New Request Visibility field</b> (Service Cloud case ID: 00718119)</p> <p>Request visibility enables users to allow or restrict access to a request they created to other team members. When the <b>Request Visibility</b> field is set to <b>Shared</b>, all the requests are accessible by all members, owners, and team admins. If the field is set to <b>Private</b>, the requests are available only to the user who has created the request, owner, and the team admin.</p>

**What's new****Enhancement to the Processes page**

The following enhancements are available on the **Processes** page:

- Sort the processes by name, in ascending or descending order.
- Toggle the pinning of a process.
- Use the responsive view to adjust the display to the screen size.

**Cloud storage usage**

Based on the maximum file and storage sizes, users who upload files can use cloud storage. The quota for storage is as follows:

- The size of the file uploaded using the **Select File** element cannot exceed 25 MB.
- By default, the storage can store a maximum of 100 MB of data.
- It is extended to an additional 1 GB for every AARI user license allocated.

**Copy process to URI feature**

The AARI admin can use the new **Copy process to uri to clipboard** feature in the **Process setup** page to obtain the URI data and share with team members as reference when they enter the URI data to the **Create a Request** action.

[AARI web package](#)

**Add rows from header row context menu**

Only the header row is displayed when a form that has a table is launched during bot runtime. Use one of the following methods to add new rows to the table:

- Header row context menu of the table

[Using the Table element](#)

- The **Set** action in a bot

[Using Set action](#)

**Support for interface triggers on Google Chrome**

Interface triggers are now supported on the Google Chrome browser for the following actions during bot runtime:

- When you click a button element in a form
- For **Got focus** and **Lost focus** actions in a text box
- When a preconfigured hot key is used with the **Got focus** action in a text box

[Add an interface trigger](#)

What's changed
<p><b>Upgrade changes to teams and processes</b></p> <p>For users who had access to processes, when they upgrade to the latest Automation 360 version, their existing teams remain the same but is now set to a <b>shared</b> team type, regardless of their existing team assignment. AARI users and managers, are now converted to <b>member</b> and <b>admin</b> team roles, respectively. While any existing processes assigned to your team are shown as <b>Team Migrated for Process</b> after the upgrade.</p> <p>For AARI managers (process manager) who could create requests without assigning process to teams. After the upgrade, the AARI managers must create teams, ask the AARI admin to assign teams to a process in order to create new requests.</p> <p>Processes have the <b>by user</b> option set by default for teams to view a process. You must choose the <b>by bot</b> option to have request be created by bots or another process.</p> <p><a href="#">Using AARI on the web interface</a>   <a href="#">Assign an AARI team to a process</a></p>
<p><b>Update to Auto Assign feature</b></p> <ul style="list-style-type: none"> <li>In the <b>Human Task</b>, you can no longer use the auto-assign feature to assign the task automatically to the manager. You can auto-assign the task to the user who created the request.</li> <li>The option to assign the target task to the manager is now removed from the <b>Go to</b> element.</li> </ul> <p>You can now override the previous auto-assign setting by selecting the <b>Override task assignment setting</b> option in the <b>Go to</b> panel by either unassigning the task or assigning the task to the user who created the request.</p>

The following table lists the fixes and the builds in which they were fixed. Build 9637 is the latest build for Cloud and includes fixes from the previous builds (including Build 9604). On-Premises is on Build 9642.

Fixes		
Build	Service Cloud case ID	Description
9604	00765406	When you enter more than four number values with a comma in a <b>Number</b> element field in the initial forms or tasks, the field can now accept the large number value without issues.
9595	00719862	In the <b>Team Setup</b> page, you can now view the members of your team and check if the member count is consistent with the number of team members.
9595	00738934	Users can now view, upload, download, or delete their files when they add the <b>Select File</b> element to forms to complete tasks in the web interface.
9595	00767008	When you upload a file with the <b>Select File</b> element in your tasks, the bot now downloads your file through the <b>Get Storage file</b> action without issues.

Fixes		
Build	Service Cloud case ID	Description
9595	--	Long text for the label name of <b>Radio button</b> and <b>Checkbox</b> elements in a form is now displayed completely.

Limitations
<p>When you log in to AARI Assistant application as a non-attended user, it shows an error as expected. However if you use that same credentials, or credentials from another non-attended user, and log in again to the application, it takes you to the web interface page.</p> <p><b>Workaround:</b></p> <ol style="list-style-type: none"> <li>1. Log in to the AARI Assistant application as an attended user.</li> <li>2. First, log in to the web interface (<code>aari/#/assistant</code> URL) then log out without changing anything in the browser. Second, navigate to the AARI Assistant application on your desktop and log in as an attended user.</li> </ol>
<p>The <b>Teams</b> column in the <b>Process setup</b> page is not automatically updated when the AARI admin adds or removes their team in a process.</p> <p><b>Workarounds:</b> Use the following options on the <b>Process setup</b> page:</p> <ul style="list-style-type: none"> <li>• Click the <b>Refresh the list</b> option.</li> <li>• Click the browser's refresh option to reload the page.</li> <li>• Navigate to another tab then return to this page.</li> </ul>
<p>When you use the <b>Process Task</b> in the process editor, you cannot use the <b>Public folder</b> option in the <b>Select process file</b> field because adding a public process as a dependency to the private process is not supported.</p>
<p>When users use the <b>Image</b> element to render images, the images does not render external images in the request view when users run their tasks.</p>

## Discovery Bot

What's new
<p><b>Sort for a process tile from the Processes page</b></p> <p>You can now use the sort field to help you locate a process tile quickly. From the <b>Processes</b> page, use the drop-down menu to sort on a process tile based on the process name in alphabetical order. Alternatively, you can sort in the order of the newest process created to the oldest process and vice versa.</p> <p><a href="#">Create a Discovery Bot process</a></p>

What's new
<p><b>Enhancements to opportunities</b></p> <p>You can now review and analyze automatically generated (or system-generated) opportunities immediately from the <b>Opportunities</b> page. Auto-generated opportunities are created when at least two recordings are approved by the user. You can create a custom opportunity from an auto-generated opportunity and apply the <b>Model</b> and <b>Filter</b> options to target a specific opportunity for automation.</p> <p>You can now prioritize opportunities based on a simple formula for all recordings in a process. From the Opportunities table, you can view the cost without automation and savings for an opportunity. The system automatically calculates the cost and potential savings for each opportunity generated. You can customize these metrics based on your organization's model for cost and savings.</p> <p><i><a href="#">Review opportunities and convert to bot</a></i></p>
<p><b>Generated PDD files are available on your local server</b></p> <p>The generated PDD file for an opportunity is now stored locally on your server for On-Premises deployments. The existing PDD files are automatically moved to the new location and are not deleted when a re-installation or upgrade is performed in the Control Room.</p> <p><i><a href="#">Prerequisites for Discovery Bot</a></i></p>

Fixes	
Service Cloud case ID	Description
--	Double-click, drag-drop, click and hold, and text select are now supported when you are recording a business process.

Limitations
<p>The Control Room installer for Red Hat Enterprise Linux (version 7.7 or 7.9) does not include the Discovery Bot package.</p> <p><b>Workaround:</b> Log in to the Control Room as an admin, select <b>Manage &gt; Package &gt; Upload</b> and upload the Discovery Bot package. The package is included in the list of default packages.</p>

### Related concepts

[Automation 360 Release Notes](#)

Review the new capabilities, changes, fixes (resolved issues), security fixes, deprecated features, and limitations in each release.

[Community Edition Release Notes](#)

Review the new capabilities in different Automation 360 Community Edition releases.

## Cloud preview sandbox environment

The Cloud preview sandbox environment for Automation 360 Cloud enables you to test your production bots to ensure that these bots work seamlessly in your production environment. Use the Cloud preview sandbox environment to help plan and test new features for upcoming Automation 360 releases.

### Benefits

The Cloud preview sandbox environment is the same as any Automation 360 Cloud instance but includes updates from the upcoming new release a few weeks before Automation Anywhere Cloud is updated.

---

**Note:** The Cloud preview sandbox environment should not be used as your production environment.

---

The environment helps Automation 360 Cloud customers to perform these tasks:

- Test new features and identify any changes that might be required in your current bots.
- Preview upcoming features and enhancements.
- Better plan and manage changes for the upcoming update to your environment.

The sandbox environment is available only for Automation 360 cloud and cloud-enabled deployments. The environment is not supported for an Control Room in a data center that is hosted by you or a third-party vendor. The environment includes upcoming updates for Automation 360, Discovery Bot, AARI, and Bot Insight.

---

**Note:** IQ Bot is not included in the sandbox environment.

---

### Prerequisites

- You must have a valid Automation 360 Cloud license to use the Cloud preview sandbox environment.
- You must purchase an orderable sandbox SKU.

Contact your Customer Success Manager (CSM) or Partner Enablement Manager (PEM) for more details.

## Configure the environment

Perform the following tasks before you start using the environment:

1. De-allocate some of the licenses from your existing Automation 360 instances and allocate these licenses to the sandbox environment.
2. Switch Bot agent to the sandbox environment.

*Switch Bot agent to a different Control Room*

3. Create the required users, roles, and other Automation 360 Cloud entities in the environment:
  - *Create a user*
  - *Create and assign roles*
  - *Credentials and lockers in the Credential Vault*

4. Export bots from your existing Automation 360 Cloud.

*Export bots*

5. Import the exported bots to the Cloud preview sandbox environment using Bot Lifecycle Management.

*Import bots*

## About Automation 360

The Automation Anywhere Digital Workforce platform is the foundation to deliver the automation of complex business work securely and at scale.

### Overview

Automation 360 is an industry-leading RPA and digital workforce platform that combines an easy-to-use user interface with enterprise-class reliability and the security to enable real-time self-automation. It delivers a browser-based, intuitive experience for business users to quickly automate tasks and tools for developers to build process automation. Automation 360 provides both On-Premises and Cloud deployment options and is the first platform that provides RPA-as-a-Service as an automation solution. It enables users to automate applications across different infrastructures and industries such as banking, telecommunications, and business process outsourcing (BPO) organizations.

Automation 360 provides capabilities such as the following:

- An intuitive interface to create a bot and design business process automation workflows.
- Support for multiple operating systems including Windows, Linux, and MacOS.
- Different views of bot to facilitate collaboration: flow view for business users, list view for developers, and dual view for collaboration.
- Recorder that works across various platforms such as Microsoft Windows, Citrix, Web, and SAP.
- Advanced variables capabilities and support for JavaScript, Python, and VBScript.
- A flexible architecture that enables you to add new command packages.

### Automation 360 components

#### **Automation Anywhere Robotic Interface (AARI)**

AARI is an easy-to-use interface that enables business users to collaborate with bots. Users can start process automations, provide feedback to bots to resume processes, and escalate requests to additional users for downstream processing. AARI enables the enterprise to unlock new automation opportunities between humans and bots that RPA could not previously address.

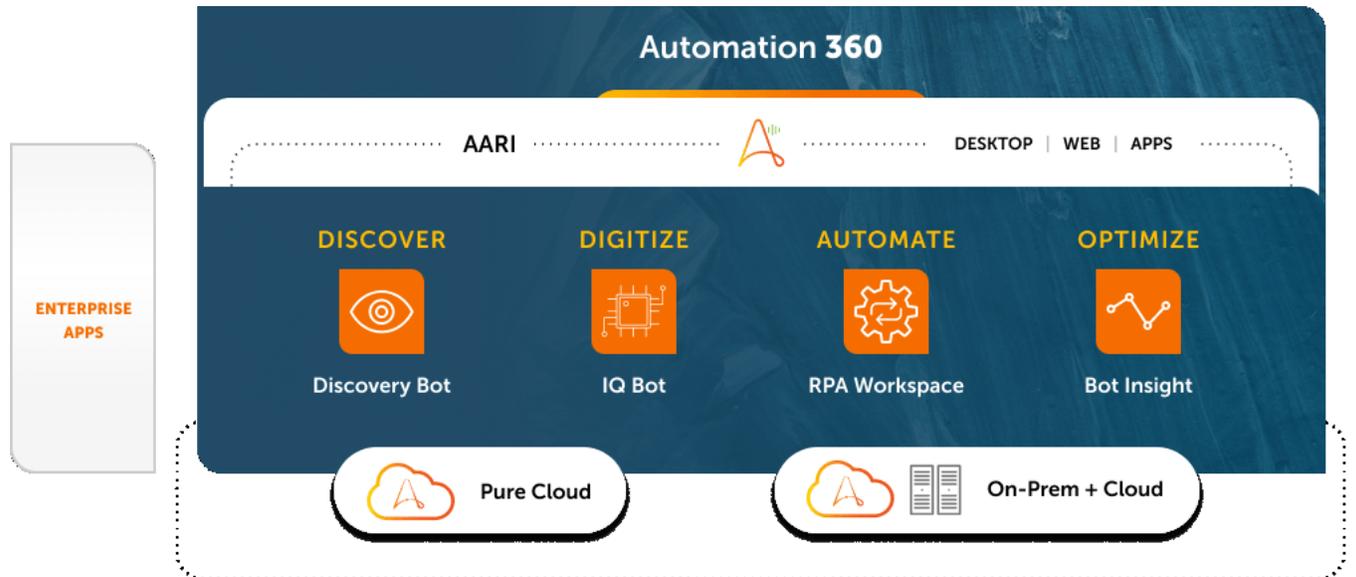
*Automation Anywhere Robotic Interface (AARI)*

#### **Discovery Bot**

An intelligent business solution for enterprise businesses that provides capabilities for end users to discover opportunities for automation using process discovery. Discovery Bot focuses on process automation by capturing document processes, identifying opportunities from business centric processes, and prioritizing opportunities based on

	ROI, and create bots automatically. Discovery Bot aligns business workers to uncover automation opportunities that can optimize the return on your RPA investment.
	<i>Process Discovery using Discovery Bot</i>
<b>IQ Bot</b>	An intelligent document processing solution that can read and process various complex documents and emails. IQ Bot combines RPA with multiple AI techniques to intelligently capture, classify, and extract semi-structured and unstructured data, allowing document-centric business processes to be automated end-to-end.
	<i>Install and update Automation 360 IQ Bot</i>
<b>Bot Insight</b>	The analytics platform that provides real-time, interactive, and smart insights about business processes and operational intelligence. Bot Insight uses the large amount of content-level and productivity data that the deployed bots generate and translates the data into insights through automatically generated and customizable dashboards.
	<i>Business analytics through Bot Insight</i>
<b>Bot Store</b>	Online marketplace for pre-built bots and Digital Workers that run on the Automation 360 platform. Access Bot Store directly from the Control Room to download or submit bots and packages.
	<i>Bot Store</i>
	<p><b>Private Bot Store</b> A secure internal bot marketplace for a company to post and share details and documentation for all internally developed bots. Employees can easily discover internal bots and commands to reuse in addition to all of bots from the Automation Anywhere Bot Store.</p> <p><i>Private Bot Store</i></p>

The following image shows the components of Automation 360:



## Benefits

### Faster time to value

- Instant web-based deployment that enables you to start developing bots quickly
- An intuitive interface that enables users with varying skill levels to easily use the product and speed up the learning process
- Easy collaboration between business, process, and IT

### Business agility

- Regular updates to stay up-to-date on any device anywhere
- Business continuity with high availability and disaster recovery
- Scalability

### Lowest total cost of ownership (TCO)

- No additional infrastructure investment required
- Single platform across front office, back office, and employee applications
- Reduced maintenance cost

## Deployment models

Automation 360 provides the following deployment models:

### Cloud

Fully hosted and managed in Automation Anywhere Cloud. This deployment model provides full SaaS experience with instant access to a complete platform that is secure, always up-to-date, and requires zero infrastructure.

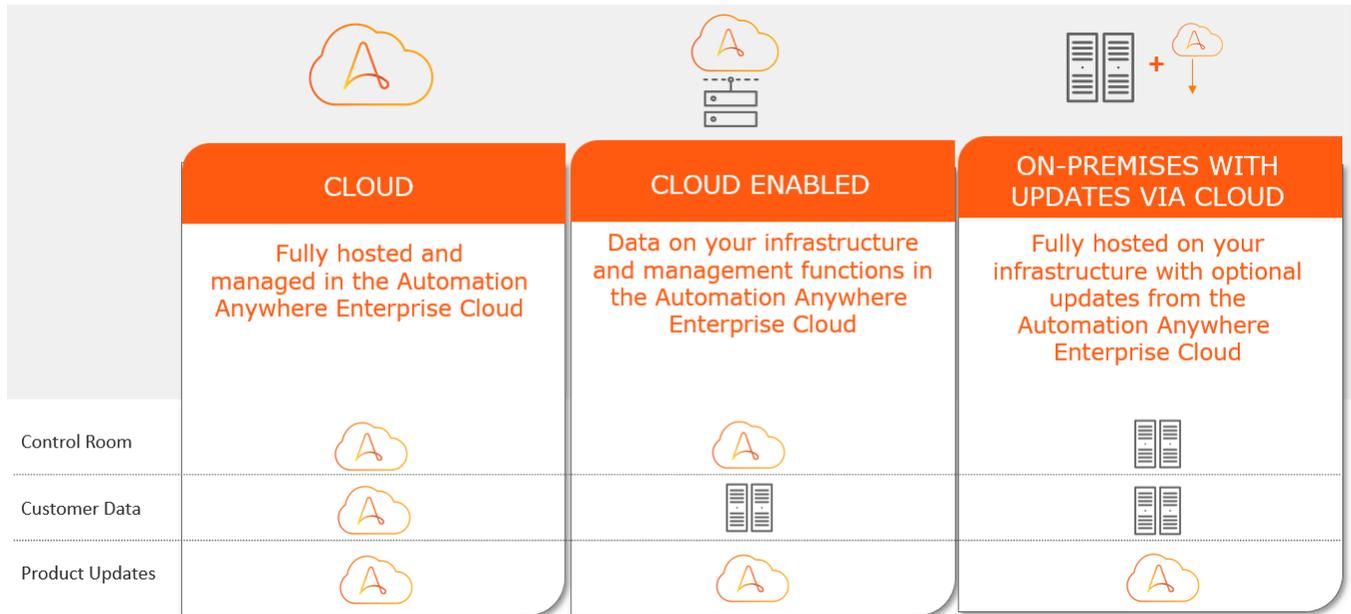
**Cloud-enabled**

Offers a SaaS experience while data is hosted On-Premises with lower total cost of ownership (TCO). This deployment model is suitable for customers who have to adhere to strict regulatory norms where data sovereignty is mandatory.

**On-Premises with updates through Cloud**

With Automation Anywhere On-Premises with updates through Cloud service, all business, personal, and operational data is kept on and deployed from the server on-premises on the customer network.

The following image shows the deployment models for Automation 360:



See also [Cloud operational responsibilities](#).

**Related information**

[Automation 360 platform](#)

[What is RPA?](#)

[RPA for Business Process Outsourcing \(BPO\)](#)

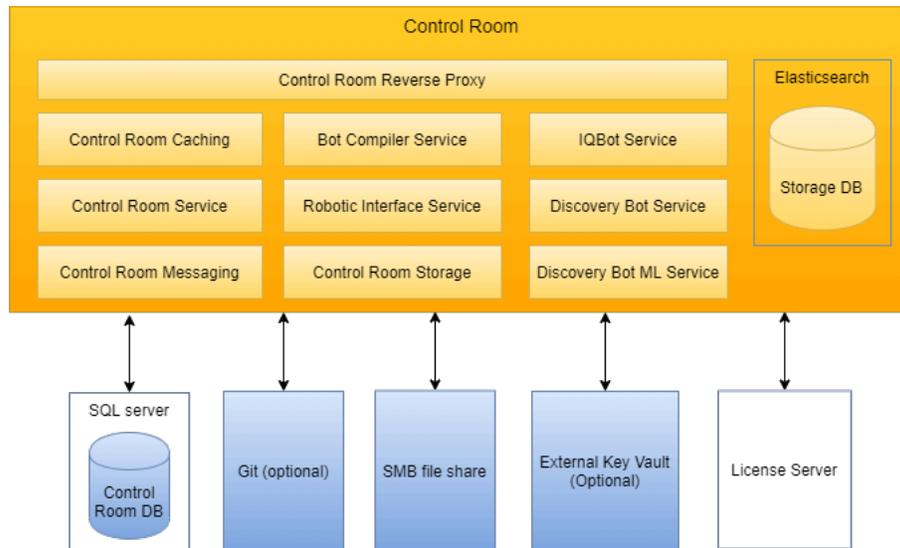
[Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#)

## Control Room overview

The Control Room manages, schedules, executes, and configures various capabilities of bots and Bot Runners using a collection of specialized web services.

### Components

The Control Room is a centralized management point for all bots. A reverse proxy is responsible for listening for remote connection requests and forwarding those requests to the correct specialized service. The following figure shows the Control Room components and general data center interaction. Control Room components are shown in orange and data center components provided by your organization are shown in blue.



In the data center, Control Room is installed on a server and configured to interact with the other data center components.

The Control Room includes objects that performs the following:

- Control Room reverse proxy is managed through the following functions:
  - Control Room services
  - Control Room messaging
  - Control Room caching
- Elasticsearch
- Licensing

The Control Room required data center components include:

- An SQL server with a Control Room database.
- A Server Message Block (SMB) file share

## Centralized Automation Deployment

- Control Room acts as the single point of access and control for bot execution.
- Control Room provides bot upload and download features to facilitate seamless collaboration for end to end business process automation by multiple users.
- All scheduling is managed by the Control Room. Bots are deployed on the Bot Runners either ad hoc or on pre-defined schedules. Once the schedules are created, Control Room automatically and intelligently picks up the subsequent updates to bots, without any need to alter automation schedules.

## Centralized Access Control

- Least Privilege and Access controls user access. They are implemented in the Control Room through Role Based Access Control (RBAC).
- All Users and Roles are created and managed from the Control Room.

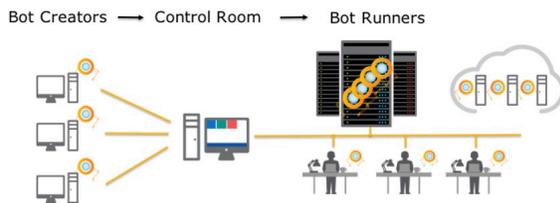
## Collaboration Centralized Workforce Management

- Control Room dashboards provide a single view of the entire automation infrastructure.
- Control Room receives real time heartbeat and telemetry from automations with events, exceptions and alerts.
- Unauthorized users cannot pause, resume or stop any of the ongoing automations on any Bot Runner.
- All historical automation data is logged in and available through Control Room Audit Logs.

## Distributed Architecture

Automation Anywhere platform is deployed using a distributed architecture.

Centralized management is accomplished via a web-based server, called the Control Room, to manage all development and execution of the digital workforce. The Control Room is connected to Bot Creators and Bot Runners. Bot Creators are development systems used for authoring and tailoring of automations. Bot Runners execute the automations; they are run-time systems installed on machines. Bot Runners can be deployed on desktops, on virtual machines in data centers or cloud.

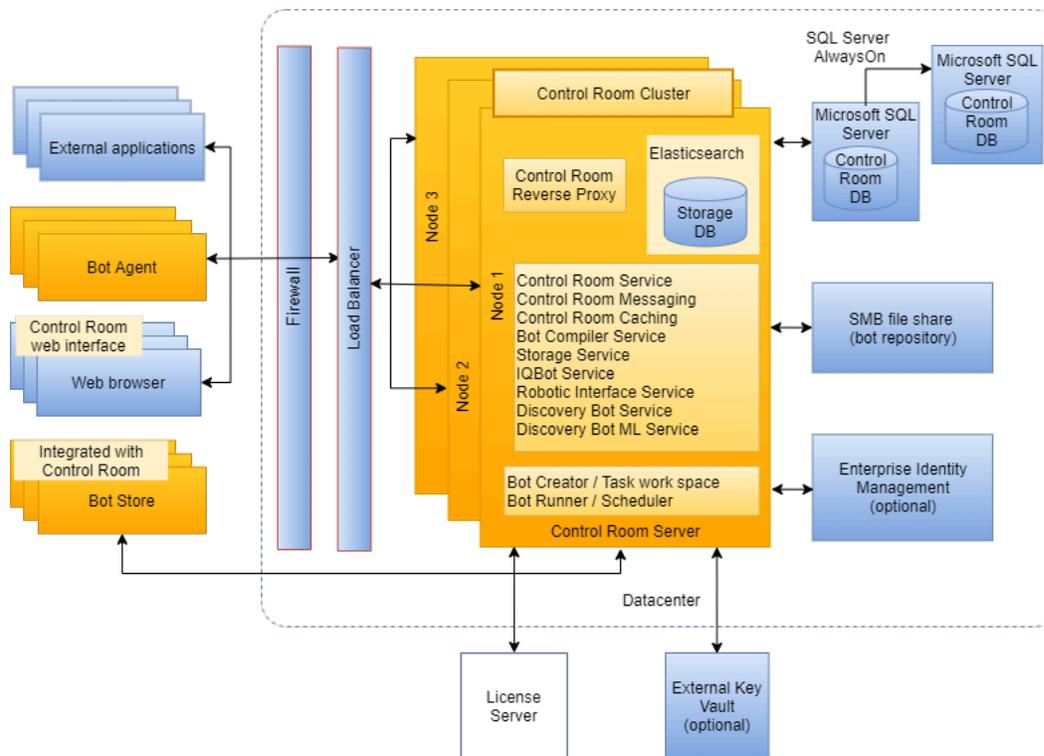


## Distributed architecture with HA/DR support

The Automation 360 self-contained platform within the customer environment mitigates the risk of "cross-contamination" from an unlikely event of a security breach from another network.

Automation Anywhere supports distributed architecture to deliver the optimal performance and security. Following are the main distributable components of Control Room which can be clustered to achieve High Availability (HA). In the image below, Automation Anywhere components are shown in orange and components provided by your organization are shown in blue.

Figure 1: Distributed Mode



## Distributed Cache

Control Room architecture uses distributed cache to update all other nodes as soon as any information is updated in one of the nodes. This ensures fastest data synchronization across all the nodes and delivers seamless user experience. Automation 360 platform uses clustering mechanism to implement distributed cache, to synchronize all data operations. For example, when the Credential Vault is opened from one node, it is automatically opened for all other nodes too.

### Related concepts

#### [High availability and disaster recovery deployments](#)

High availability (HA) provides a failover solution if a Control Room service, server, or database fails.

Disaster recovery (DR) provides a recovery solution across a geographically separated distance in the event of a disaster that causes an entire data center to fail.

## Automation 360 FAQ

For details and questions on the latest Automation Anywhere platform, Automation 360, review this FAQ.

### What is Automation 360?

Automation 360 delivers a browser-based, intuitive experience for business users to easily automate tasks and powerful tools for developers to build process automation, delivering security, governance, and control on a scalable infrastructure for IT.

### What is included in Automation 360?

Everything to build the bots you need to automate your business processes: Control Room cluster, Bot editor, Bot Runner, Universal Recorder, Enterprise-grade security certifications, support, access to the

**How is Automation 360 deployed?**

Bot Store, and courses on Automation Anywhere University.

Automation 360 can be deployed On-Premises as well as in the Cloud.

For Automation 360 On-Premises deployment, the installation is on the customer's servers. With the web-based nature of the Bot Creator, there is no installation or deployment required on the user machines, resulting in a significant reduction in total cost of ownership (TCO).

For Automation 360 deployed in the Cloud, the platform is available as a true software-as-a service (SaaS) experience. Automation Anywhere offers this SaaS experience as a turnkey solution where the buyers do not have to worry about choosing the cloud provider, or any other infrastructure elements— Automation Anywhere takes care of it all. Admins get the complete set of features for user management, security, governance, and control that they also access through a web browser. The end users can then access the platform using their browser, log in, and start creating their bots.

**What additional cloud hosting options are available?**

Automation 360 can be hosted on AWS, Microsoft Azure, Google Cloud, IBM, and any public, private, or hybrid cloud service.

**What scripting languages does Automation 360 support?**

Automation 360 supports JavaScript, Python, and VBScript.

**Is Automation 360 available in languages other than English?**

Yes, Automation 360 is available in 10 languages: English, French, German, Italian, Japanese, Korean, Portuguese, Spanish, Simplified Chinese, and Traditional Chinese.

**How is Automation 360 updated?**

For Cloud deployed Automation 360, customers are always on the latest version with updates rolled out by Automation Anywhere on a regular basis. For features such as action packages, admins and users have the ability to test the latest packages before choosing to accept the update.

For On-Premises customers, regular updates are made available through the customer portal, providing admins an opportunity to keep their business-wide installation on the version of their choice.

**What are some of the data privacy and security aspects of Automation 360?**

Automation Anywhere Cloud privacy is engineered with a comprehensive set of security features that either automatically provide or are configurable by the data owner to provide data protection. Automation Anywhere Cloud includes comprehensive security and encrypts data both in transit and at rest. No personal data is goes outside of the environment—unless you tell it to; it remains completely under the control of the IT manager.

**Is Automation Anywhere Cloud highly available?**

To ensure customers can trust the AAI Enterprise Cloud, Automation Anywhere Cloud services are secured based on industry standards and frameworks like NIST Cybersecurity Framework, AWS Cloud Adaption Framework, Center for Information Security (CIS) baselines, and others.

**Is Automation Anywhere Cloud protected with disaster recovery?**

Automation Anywhere Cloud is deployed using fully load balanced Control Room environments of Automation 360 deployed on fully HA public cloud infrastructure services within a region.

Backups are taken daily to another region (except Australia where backups are kept in country). If a disaster is declared for the primary region, then a secondary region is instantiated for all tenants using the daily backup. The current objectives for this recovery are:

- RTO (Recovery Time Objective): Time to get a new region up and running with the last backup data restored = 6 hours.
- RPO (Recovery Point Objective): The maximum duration for data loss during a restore = 24 hours.

---

**Note:** A DR region might be in a different country.

---

**Related concepts**[Automation 360 Release Notes](#)

Review the new capabilities, changes, fixes (resolved issues), security fixes, deprecated features, and limitations in each release.

## Automation 360 feature comparison matrix

Use the feature comparison matrix to compare the Automation 360 features with the features in Automation Anywhere Enterprise 11.3.x and 10.x versions.

- [Core components](#)
- [Control Room server capabilities](#)
- [Bot development](#)
- [Bot extensibility and code reuse](#)
- [Integration capabilities](#)
- [Device utilization capabilities](#)
- [Recorder capabilities](#)
- [Bot packages](#)
- [Variables support](#)

## Core components

	<b>Automation 360</b>	<b>Enterprise Version 11.3.x</b>	<b>Enterprise Version 10.x</b>
Target user	Citizen Developer Specialist/RPA Developer IT	RPA Developer IT	RPA Developer IT
Delivery model	On-Premises Cloud Cloud-enabled	On-Premises	On-Premises BotFarm (for Bot Runners)
Operating system	Microsoft Windows Linux (Linux CentOS 7.7, 7.9, and 8.3) and (Red Hat Enterprise Linux 7.7, 7.9, and 8.3)  (Operating system not applicable for Cloud)	Microsoft Windows	Microsoft Windows
Microsoft Active Directory support	Available (On-Premises and Cloud-enabled)	Available	Available
SAML 2.0	Available	Available	Not available
Authenticated proxy support	Available	Not available	Not available
Localized user interface (UI)	15 plus languages	3 languages	Not available
Bot Insight support	Available	Available	Available (Basic)
IQ Bot support	Available	Available	Available (Basic)
Interactive forms (attended automation) support	Available	Not available	Not available
Bot Creator platform	On premises thin client	Thick client	Thick client
Bot Runner platform	Web-deployed	Thick client	Thick client
Attended bots	Available	Available	Not available
Unattended bots	Available	Available	Available
Upgrade to use new actions or commands	No upgrade required for Cloud Upgrade required for On-Premises and Cloud-enabled	Upgrade required	Upgrade required
Automated queuing for job	Available	Available	Not available

	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Centralized licensing	Available	Available	Available
High availability	Available	Available	Available
Load balancing	Available	Available	Available
Disaster recovery	Available	Available	Available
Multi-domain support	Available	Available	Available
Hosting technology	Java	<ul style="list-style-type: none"> <li>Java (Control Room)</li> <li>Microsoft .NET Framework (Enterprise client)</li> </ul>	Microsoft IIS
Role-based access	Available	Available	Available
Power BI	Available	Not available	Not available
Tableau connector for Bot Insight	Available	Not available	Not available
Version Control	Available through Git integration (Subversion is deprecated)	Available through Subversion integration	Not available
Syslog integration	Not available	Available	Not available

### Control Room server capabilities

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Version control <ul style="list-style-type: none"> <li>Set production version</li> <li>Roll back to previous version</li> <li>Compare two versions of a bot</li> </ul>	Not available	Available	Available
Version control - Check version history	Available	Available	Available
Multi or two factor authentication	Available (through SSO)	Available (Native and through SSO)	Not available
Banner text on Control Room login	Not available	Available	Not available
Install Control Room on Oracle Database	Not available	Available	Not available

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Audit log	Available (Exporting logs spanning across multiple pages is not available)	Available	Available
Open web page in a new or existing tab of Internet Explorer	Not available	Available	Available
Open web page in a new or existing tab of Google Chrome	Available	Not available	Not available

## Bot development

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
In-product learning	Available	Not available	Not available
Bot Creator Flow view	Available	Not available	Not available
Bot Creator Dual view	Available	Not available	Not available
Bot Creator Code view	Available	Available	Available
Bot Creator Visualize view	Not available	Available	Available
Actions search	Available	Not available	Not available
Advanced expressions	Available	Limited availability	Limited availability
Regular expressions	Available	Available	Available
Remote device testing	Available (Develop on one device and test on another device)	Not available	Not available
Localized actions	Available	Not available	Not available
Collaborative development	Available	Not available	Not available
Bot Store integration	Available	Available (Version 11.3.3 and later)	Not available
Email triggers	Available	Available	Available
File and folder triggers	Available	Available	Available
Hot-key triggers	Available	Available	Available
User Interface triggers	Available	Not available	Not available
Performance triggers	Not available	Available	Available

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Process triggers	Not available	Available	Available
Service triggers	Not available	Available	Available
Windows triggers	Not available	Available	Available
MetaBot Logic	Available through TaskBot	Available	Available
MetaBot DLL	Available through DLL: Run function action	Available	Available
MetaBot Screen recalibration	Not available	Available	Available
Bot Lifecycle Management (BLM) - Import and export bots	Available	Available	Not available
Global values	Available	Not available	Not available
Bot cloning	Available	Not available	Not available
API deployment	Available	Available	Not available
Bot Runner sessions in Control Room	Available	Available	Available
Packaging Bot dependencies	Available	Available	Available
Bypass legal disclaimer	Available	Available	Available
Edit variable name	Available	Available	Available
Copy commands from one bot to another	Available The following options are not available: <ul style="list-style-type: none"> <li>• Image recognition</li> <li>• Triggers</li> </ul>	Available	Available
Save bot as XML/TXT	Not available	Available	Available
Disable mouse and keyboard for the bot	Not available	Available	Available
Run bot in stealth mode	Not available	Available	Available

## Bot extensibility and code reuse

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Custom actions in palette	Available (build using Package Development Kit)	Not available	Not available
Inline scripting	Available in Python, VBScript, and JavaScript	Not available	Not available
Code reuse	Available for TaskBots, custom actions, and DLLs	Limited availability for MetaBots and DLLs	Limited availability for MetaBots and DLLs
Quick map for variables	Available	Available	Available
Bot timeout	Not available	Available	Available
Bot priority	Available	Available	Available

## Integration capabilities

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Callouts using inline scripting	Available for Python, VBScript, and JavaScript	Not available	Not available
Control Room APIs	Available	Available	Not available
REST Web Service	Available	Available	Available
SOAP Web Service	Available	Available	Available

## Device utilization capabilities

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Workload management (WLM)	Available	Available	Not available
Device pools	Available for scheduling and WLM	Available in WLM only	Not available
Run-as users pool for automations	Available Set up multiple run-as users for device pools to provide effective license and device utilization	Not available	Not available

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Background processing	Available	Not available	Not available
Non-persistent virtual desktop infrastructure (VDI)	Available	Available	Available

### Recorder capabilities

Feature	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
AISense Recorder	Available	Available	Not available
Unified Recorder	Available (includes support for Microsoft Edge Chromium) <ul style="list-style-type: none"> <li>Pattern-based data extraction is not available</li> <li>Legacy Microsoft Edge and Flash/Flex are deprecated</li> </ul>	Not available (Recording capabilities through Web Recorder, Smart Recorder, and Standard or Screen Recorder)	Not available (Recording capabilities through Web Recorder, Smart Recorder, and Standard or Screen Recorder)
Recorder for Web/Windows	Available	Available	Available
Recorder for SAP	Available for 64-bit Version 750 Patch 9 or later	Available	Not available
Recorder for Citrix	Available - ICA Agent-based	Available	Not available
Recorder for Oracle	Available	Available	Not available
Secure recording	Available	Available	Available
Microsoft Silverlight 5 desktop and web applications	Available (Third-party controls are not available)	Available	Available
Selection of capture technology in recorder	Not available	Available	Available

### Bot packages

Feature	Automation 360 packages	Enterprise Version 11.3.x commands	Enterprise Version 10.x commands
AARI web	Available	Not available	Not available

Feature	Automation 360 packages	Enterprise Version 11.3.x commands	Enterprise Version 10.x commands
Active Directory	Available	Available	Available
Analyze	Available	Not available	Not available
Application	Available	Available	Available
App Integration	Available	Available	Available
Boolean	Available	Not available	Not available
Bot migration	Available	Not available	Not available
Browser	Available The following options are not available: <ul style="list-style-type: none"> <li>• Open web page in a new or existing tab of Internet Explorer</li> <li>• Iframe support in Execute Java script in a web page</li> <li>• Iframe support in extract source from a web page</li> </ul>	Available (through Web recorder)	Available (through Web recorder)
Citrix Automation	Not available (Deprecated and replaced with Unified Recorder)	Available	Available
Clipboard	Available	Available	Available
Comment	Available	Available	Available
Credential Vault	Available	Available	Available
CSV/TXT	Available	Available	Available
Data Table	Available	Available using Array type variable	Available using Array type variable
Database	Available	Available	Available
Datetime	Available	Not available	Not available
Delay	Available	Available	Available
Dictionary	Available	Not available	Not available
DLL	Available	Limited availability through MetaBots	Limited availability through MetaBots

Feature	Automation 360 packages	Enterprise Version 11.3.x commands	Enterprise Version 10.x commands
Email	Available (SMTP, EWS, and Outlook)  The following options are not available: <ul style="list-style-type: none"> <li>Send email with template</li> <li>Add picture inside the Email</li> <li>Font styles</li> </ul>	Available (SMTP, EWS)	Available (SMTP)
Error handler	Available (Advanced - Try, Catch, Finally, Throw)	Available (Basic)	Available (Basic)
Excel advanced	Available	Limited availability	Limited availability
Excel basic (without Excel)	Available	Not available	Not available
File operations	Available	Available	Available
Folder operations	Available	Available	Available
FTP / SFTP	Available	Available	Available
If	Available	Available	Available
Image Recognition	Available (Relative click is not available)	Available	Available
Interactive form operations	Available	Not available	Not available
Internet Connection	Not available (Deprecated for Automation 360)	Available	Available
IQ Bot	Available	Available	Available
IQ Bot Pre-processor	Available	Not available	Not available
IQ Bot (Local Device)	Available	Not available	Not available
JavaScript	Available	Available through Run Script	Available through Run Script
Legacy Automation (for migrated bots)	Not applicable	Not available	Not applicable
List operations	Available	Not available	Not available
Log To File	Available	Available	Available
Loop	Available	Available	Available
Message Box	Available	Available	Available

Feature	Automation 360 packages	Enterprise Version 11.3.x commands	Enterprise Version 10.x commands
MetaBot screens	Not available (Replaced with Universal Recorder)	Available	Available
Mouse	Available	Available	Available
Number	Available	Not available	Not available
OCR	Available	Available	Available
Office 365 Calendar	Available	Not available	Not available
Office 365 Excel	Available	Available (Desktop)	Not available
Office 365 OneDrive	Available	Not available	Not available
One Drive	Available	Not available	Not available
PDF	Available	Available	Available
PGP	Available	Available	Available
Ping	Available	Not available	Not available
Play Sound	Available	Available	Available
Printer	Available	Available	Available
Prompt	Available	Available	Available
Python Script (Inline)	Available	Not available	Not available
Recorder	Available	Available	Available
REST Web Service	Available	Available	Available
SAP support	Available (Native)	Limited availability through MetaBots	Limited availability through MetaBots
SAP BAPI	Available	Available	Available
Screen	Available	Available	Available
Services	Available	Available	Available
Simulate keystrokes	Available	Available	Available
SNMP	Available	Available	Available
SOAP Web Service	Available	Available	Available
Step	Available	Not available	Not available
String	Available	Available	Available
System	Available	Available	Available
TaskBot	Available	Available	Available
Terminal Emulator	Available	Available	Available
Trigger Loop	Available	Not available	Not available
VBScript (Inline)	Available	Not available	Not available

Feature	Automation 360 packages	Enterprise Version 11.3.x commands	Enterprise Version 10.x commands
Wait	Available	Available	Available
Window	Available The following options are not available for new bots: <ul style="list-style-type: none"> <li>• Close all Windows</li> <li>• Capture region option for Windows package</li> <li>• Wait for screen change</li> </ul>	Available	Available
Workload	Available	Available	Not available
XML	Available	Available	Available

## Variables support

**Important:** When you migrate from Enterprise versions 11.3.x or 10.x to Automation 360, some variables are mapped directly while some contain a different configuration.

Variable	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
<b>Application variables</b>			
Analytics	Available	Available	Not available
ArrayRows	Available through Recursive expressions	Available	Available
ArrayColumns	Available through Recursive expressions	Available	Available
Clipboard	Available	Available	Available
Credential	Available	Available	Not available
Dictionary	Available through Dictionary package	Available	Not available
Enter (String variable)	Available	Available	Available
Prompt Assignment (user-defined)	Available	Available	Available
Read from Excel/CSV	Available through Excel advanced package	Available through Array type user-defined variable	Available through Array type user-defined variable
Read from database	Available through Data Table package	Available through Array type user-defined variable	Available through Array type user-defined variable

Variable	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Read from text file	Available through Boolean, Datetime, Number, and String packages	Available through Array, List, and Value type user-defined variables	Available through Array, List, and Value type user-defined variables
Separator (String variable)	Available	Available	Available
Tab (String variable)	Available	Available	Available
Work Item	Available	Available	Not available
<b>System variables</b>			
AAApplicationPath	Available through global values	Available	Available
AADefaultDateFormat	Available through global values	Not available	Not available
AAInstallationPath	Available	Available	Available
AATaskExecutor	Available (Execution_type key is not available)	Available	Not available
AATaskName	Available	Available	Not available
AAControlRoom	Available	Available	Not available
Counter	Available through Number and Loop packages	Available	Available
CPUUsage	Available	Available	Available
CurrentDirectory	Available through Loop package	Available	Available
DatasetColumn	Available through Loop package	Available	Available
Date	Available	Available	Available
Day	Available	Available	Available
Email (includes EmailFrom, EmailMessages, EmailReceivedDate, EmailReceivedTime, EmailSubject, EmailTo, EmailSentDate, and EmailSentTime)	Available through Email, Dictionary, and Loop packages	Available	Available
ErrorLineNumber	Available through Error handler package	Available	Available
ErrorDescription	Available through Error handler package	Available	Available

Variable	Automation 360	Enterprise Version 11.3.x	Enterprise Version 10.x
Excel (includes ExcelColumn, ExcelCell, ExcelCellColumn, and ExcelCellRow)	Available through Excel advanced package	Available	Available
Extension	Available through Loop package	Available	Available
FileDataColumn	Not available	Available	Available
FileName	Available through File package	Available	Available
FolderName	Available through Folder package	Available	Available
Hour	Available	Available	Available
Machine	Available	Available	Available
Millisecond	Available	Not available	Not available
Minute	Available	Available	Available
Month	Available	Available	Available
OSName	Available	Available	Available
PDF (includes PDFFileName, PDFTitle, PDFAuthor, and PDFSubject)	Available through PDF, Dictionary, and Loop packages	Available	Available
RAMUsage	Available	Available	Available
Second	Available	Available	Available
TableColumn	Not available	Available	Available
TotalRAM	Available	Available	Available
Trigger	Available through Interface trigger	Available	Available
Year	Available	Available	Available
XMLDataNode	Not available	Available	Available

**Related concepts**[Automation 360 Release Notes](#)

Review the new capabilities, changes, fixes (resolved issues), security fixes, deprecated features, and limitations in each release.

[Package Software Development Kit \(SDK\)](#)

Review the requirements and process for creating and uploading an action package to your Control Room.

**Related reference**[Operating system, environment, and platform supported for Control Room](#)

Automation 360 can be hosted on AWS, Microsoft Azure, Google Cloud Platform, IBM, and any public, private, or hybrid cloud service that meets the Control Room and Bot agent hardware and software requirements.

### [Automation 360 FAQ](#)

For details and questions on the latest Automation Anywhere platform, Automation 360, review this FAQ.

### [Variable mapping for migration](#)

Some variables map directly from previous product versions to Automation 360 while others behave differently or contain configuration changes.

### [Global values](#)

Global values enable users to reuse identical values between bots instead of creating new variables for each bot. A user with the `AAE_admin` role configures a global value with a default value and can enable non-admin users to overwrite the value to use in their bots.

### [Recursive expressions](#)

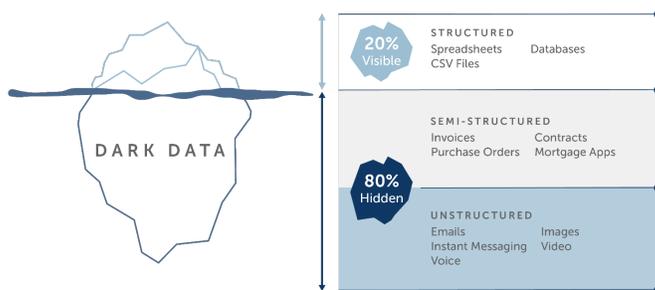
Use a recursive expression to insert a variable in the place of an index or key of a dictionary, list, record, or table variable.

## Automation 360 IQ Bot

Automation 360 IQ Bot provides cognitive (intelligent) automation that can learn further from humans to uncover and transform important, but less structured data to automate business processes quickly and efficiently, simultaneously reducing human error.

### Overview

Cognitive automation processes semi-structured and unstructured data and converts it into structured data that is used by Robotic Process Automation (RPA) bots for end-to-end automation.



IQ Bot leverages machine learning for continuous enhancement learning from user actions. Start using IQ Bot by creating a learning instance, which defines the type of document you must process, the language of documents, and a list of data fields to capture and extract from each document. Next, train the documents and review the results of the training. You can also download the extracted data to a CSV file for review. After correcting any errors, save the bot and send it for production. In the production environment, run the trained bot against a set of documents to automate data extraction.

### Features and benefits of using IQ Bot

Use IQ Bot for the following features:

- Use the wizard for learning instance training in order of importance on the web-based Designer.
- Download new domains from the Bot Store and reduce setup time for new use cases with the Domain Management utility.

- If you are logged in to the Control Room with the Single Sign-on feature, you can open the IQ Bot Portal directly.
- Leverage the stronger security features in the Automation Anywhere platform as part of IQ Bot Version 6.0 integration.
- Exception handling is fast and seamless with the web-based Validator.
- Preview the data extraction results to verify the training provided to the learning instance.
- Use semantic analysis and automated classification to analyze and extract data types and formats from learning algorithms, invoices, purchase orders, and bills. It also does the following:
  - Autodetects file values after field mapping
  - Autocorrects exceptions from human expertise
  - Flags exceptions based on the built-in confidence levels mechanism
  - Uses the cross-field mapping rules and field-collision resolution
- Leverage current computer vision technology OCR, document classification, and data extraction of documents.
- Support for 190 languages, including English, French, German, Italian, Spanish, Japanese, Korean, Simplified Chinese, and Traditional Chinese.

---

**Note:** The user interface language drop-down list appears by default. Select the respective language from the list.

---

## Resources

To learn more, search for the following courses in [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#):

- *Intelligent Document Processing with IQ Bot*
- *Unleash Your Intelligent Bots: Develop Cognitive Bots Driven by AI & Machine Learning (IQ Bot)*

## Phases in IQ Bot business process

1. Preprocess documents.
2. Receive text segmentation and optical character recognition (OCR).
3. Classify documents in groups.
4. Extract document data.
5. Validate and correct failed documents.
6. Complete validation and save.
7. Trigger approval.
8. Obtain final review and approval.

IQ Bot continues to learn from human corrections to become smarter and more accurate over time.

## User prerequisites

Users who create and configure automation tasks and deploy TaskBots also create IQ Bot learning instances, deploy the learning instances from staging to production environments, and correct documents with exceptions.

The primary user roles are as follows:

- **Services users:** Automation experts who train bots on sample documents, so these bots can later automatically process a larger volume of documents.
- **Validators:** Use a visual interface to manually verify or fix data extraction from a document.

Users are required to have an understanding of the following:

- Common administrative tasks of Automation Anywhere Control Room
- Differences between structured, semi-structured, and unstructured documents
- Standard fields in a semi-structured or unstructured document, for example, invoice number, invoice date, and so on.
- General automation commands in Automation Anywhere
- Internet information services
- How to start and stop web services
- How to block and unblock ports

### Related concepts

#### [IQ Bot standard forms](#)

Standard forms are one of the document types in Automation 360 IQ Bot that enables you to create a learning instance for content extraction.

## Automation 360 IQ Bot feature comparison matrix

Compare the key features of Automation 360 IQ Bot deployment models and review the feature parity with the latest IQ Bot 11.3.x release.

IQ Bot basic features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Prebuilt domains	Yes	Yes	Yes Supported domains include: <ul style="list-style-type: none"> <li>• Invoices</li> <li>• Purchase orders</li> <li>• Bank statements</li> <li>• Credit memo</li> <li>• Utility bills</li> </ul>	Yes
User confidence threshold in Validator	Yes	No	No	Yes
Learning instance creation/editing/renaming	Yes	Yes	Yes	Yes
Document image preprocessing	Yes	Yes	Yes	Yes
Document image classification	Yes	Yes	Yes	Yes
Document image OCR	Yes	Yes	Yes	Yes

IQ Bot basic features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Google Vision OCR	Yes	Yes	Yes	Yes
Tegaki API OCR engine	Yes	No	No	Yes
MICR (magnetic ink character recognition) extraction	Yes	Yes	Yes	Yes
PDFBox Toggle	Yes	Yes	Yes	Yes
Caching (enhanced performance)	Yes	Yes	Yes	Yes
Bot limiting	Yes	Yes	No	Yes
Bot creation/editing/deletion	Yes	Yes	Yes	Yes
Designer/Preview/Test	Yes	Yes	Yes	Yes
Production toggle	Yes	Yes	Yes	Yes
Validator	Yes	Yes	Yes	Yes
CSV output files	Yes	Yes	Yes	Yes
Learning instance import/export	Yes	Yes	No	Yes

Domain/training features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Web-based UI	Yes	Yes	Yes	Yes
Domain import/export	Yes	Yes	No	Yes
Hover over text segment to view OCR	Yes	Yes	Yes	Yes
Resize mapped box in Designer	Yes	Yes	Yes	Yes
Delete mapped box in Designer	Yes	Yes	Yes	Yes
Populate text in <b>End of table/section indicator</b>	Yes	Yes	Yes	Yes
Single click to extract text in the Validator	Yes	Yes	Yes	Yes
Document group description	Yes	Yes	Yes	Yes
<b>See extraction results</b> action displays list of all training documents in an alphanumeric sequence	Yes	Yes	Yes	Yes

Domain/training features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
InstallShield patch installer with simplified upgrade/downgrade for IQ Bot	Yes	No	No	Yes
OCR Pre-processing Settings configuration	Yes	No	No	No

Extraction/validation features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Original IQ Bot text segmentation/document classifier from IQ Bot Version 5.3.0/6.0	Yes	No	No	Yes
New IQ Bot text segmentation/ document classifier from IQ Bot Version 5.3.1/6.5	Yes	Yes	Yes	Yes
Option to select classifier version of existing learning instances during IQ Bot upgrade: <ul style="list-style-type: none"> <li>Version 1 (IQ Bot 5.3.0 or before 6.0)</li> <li>Version 2 (IQ Bot 5.3.1/ Version 6.5 Beta)</li> </ul>	Yes	No	No	Yes
Enhanced compatibility with ABBYY FineReader Engine 12.2 Plugin	Yes	Yes	Yes	Yes
Automated installation of ABBYY FineReader Engine 12.2 Plugin	Yes	Yes	Yes	Yes
Validator auto-correction	Yes	Yes	Yes	Yes
Check box extraction	Yes	Yes	Yes	Yes
Check box auto-detection	Yes	Yes	Yes	Yes
Advanced extraction: Repeated tables/sections; linking tables/sections; map some header-less columns	Yes	Yes	Yes	Yes
Alternative to stop extraction at <b>End of table/section indicator</b>	Yes	Yes	Yes	Yes

Extraction/validation features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Select text segments that enclose or are enclosed by other text segments	Yes	Yes	Yes	Yes
Option to select default training document	Yes	Yes	Yes	Yes
Formula validation	Yes	Yes	Yes	Yes
List validation in UI	Yes	Yes	Yes	Yes
List validation through external file	No	No	No	No
File/folder search validator	Yes	Yes	Yes	Yes
Microsoft Azure Computer Vision API (OCR)	Yes	Yes	Yes	Yes
Add user logic in the Designer	Yes	Yes	Yes	Yes
View and test all documents in the <b>Designer &gt; See extraction results</b>	Yes	Yes	Yes	Yes
IQ Bot extensions	Yes	No	No	Yes
Import standard form domains	Yes	Yes	No	Yes
(Beta) Enabled data capture and OCR using Google Vision API for Asian languages	Yes	Yes	Yes	Yes
Magnetic ink character recognition (MICR) extraction	Yes	Yes	Yes	Yes
Option to turn off PDFBox as OCR engine	Yes	Yes	Yes	Yes
Using variables in IQ Bot package	Yes	Yes	Yes	No
Extraction results opening in a new browser tab	Yes	Yes	Yes	No

Enterprise features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Access IQ Bot without device license (without Bot Creator or Bot Runner license)	Yes	Yes	Yes	Yes
Access IQ Bot as Validator users without Bot Creator or Bot Runner license	Yes	Yes	Yes	Yes
Database encryption	Yes	Yes	Yes	Yes

Enterprise features	Automation 360 IQ Bot			IQ Bot 11.3.x
	On-Premises	Cloud	Community Edition	
Roles-based access (RBAC) for new learning instances	Yes	Yes	No	Yes
Audit logs	Yes	Yes	No	Yes
Windows authentication	Yes	Yes	No	Yes
Azure PaaS Database Service	Yes	No	No	Yes
Counter for number of uploaded pages in production	Yes	Yes	No	Yes
API access	Yes	Yes	Yes	Yes
Access IQ Bot without <i>sysadmin</i> role that includes support for Amazon Relational Database Service (RDS) out of the box	Yes	No	No	Yes
Migrate learning instances as other learning instances are being edited	Yes	Yes	No	Yes
Migration Utility UI	Yes	Yes	No	Yes
Internationalization	Yes	Yes	Yes	Yes
UI Localization: <ul style="list-style-type: none"> <li>• Chinese Simplified</li> <li>• Chinese Traditional</li> <li>• French</li> <li>• German</li> <li>• Japanese</li> <li>• Korean</li> <li>• Spanish</li> <li>• Italian</li> <li>• Portuguese</li> </ul>	Yes	Yes	Yes	Yes

Automation 360 packages	Automation 360 IQ Bot		
	On-Premises	Cloud	Community Edition
IQ Bot Classifier package	Yes	Yes	No
IQ Bot [Local Device] package	Yes	Yes	Yes
IQ Bot Pre-processor package	Yes	Yes	Yes
IQ Bot Extractionpackage	Yes	Yes	No

### Related information

[IQ Bot feature comparison matrix](#)

## Automation 360 IQ Bot version compatibility

Review the version compatibility information before you upgrade from an earlier version of Automation 360 IQ Bot to the latest Automation 360 IQ Bot version, or from earlier versions of IQ Bot to Automation 360 IQ Bot.

- [IQ Bot On-Premises](#)
- [IQ Bot Cloud](#)

### Compatibility with Automation 360 Control Room

Automation 360 IQ Bot On-Premises version compatibility with Automation 360 Control Room:

<b>IQ Bot On-Premises</b>	<b>Control Room</b>
Build 9596	Build 9642 (Automation 360 v.21)
Build 8815	Build 8815 (A2019.20)
Build 8098	Build 8147 (A2019.19)
Build 7554	Build 7560 (A2019.18)
Build 7082	Build 7103 (A2019.17)
Build 6443	Build 6463 (A2019.16)
Build 5931	Build 5933 (A2019.15)
Build 5322	Build 5322 (A2019.14)
Build 4695	Build 4705 (A2019.13)
Build 4088	Build 4105 (A2019.12)
Build 3337	Build 3337 (A2019.11)
Build 2545	Build 2545 (A2019.10)
Build 2079	Build 2079
Build 1610	Build 1610
Build 1089	Build 1089
Build 550	Build 550

Automation 360 IQ Bot Cloud version compatibility with Automation 360 Control Room:

<b>IQ Bot Cloud</b>	<b>Control Room</b>
Build 9604	Build 9637 (Automation 360 v.21)

### Migration compatibility with earlier IQ Bot versions

Review the following version compatibility table to understand the available upgrade options for Automation 360 IQ Bot:

<b>IQ Bot version</b>	<b>Automation 360 IQ Bot (On-Premises)</b>
Version 11.3.5.x	Yes
Version 11.3.4.x	Yes

To migrate to Automation 360 IQ Bot On-Premises from a version earlier than 11.3.4.x, first upgrade to IQ Bot Version 11.3.4.x or later.

#### *Migrate to Automation 360 IQ Bot*

Importing learning instances between different IQ Bot versions is not supported. If you want to retain the associated data for a learning instance, ensure you update or migrate to the correct IQ Bot version before importing the corresponding learning instance. For example, if you export a learning instance in IQ Bot On-Premises (Build 8815), you can only import it within the same build.

#### *Migrate learning instances*

## Automation Anywhere Robotic Interface (AARI)

Automation Anywhere Robotic Interface or AARI provides a simple, front-end interface for users to execute and interact with bots and applications.

Use AARI from within applications such as Salesforce and within browsers and desktops for end-to-end process automation across the enterprise by connecting bots in the front and back offices.

### Why use AARI

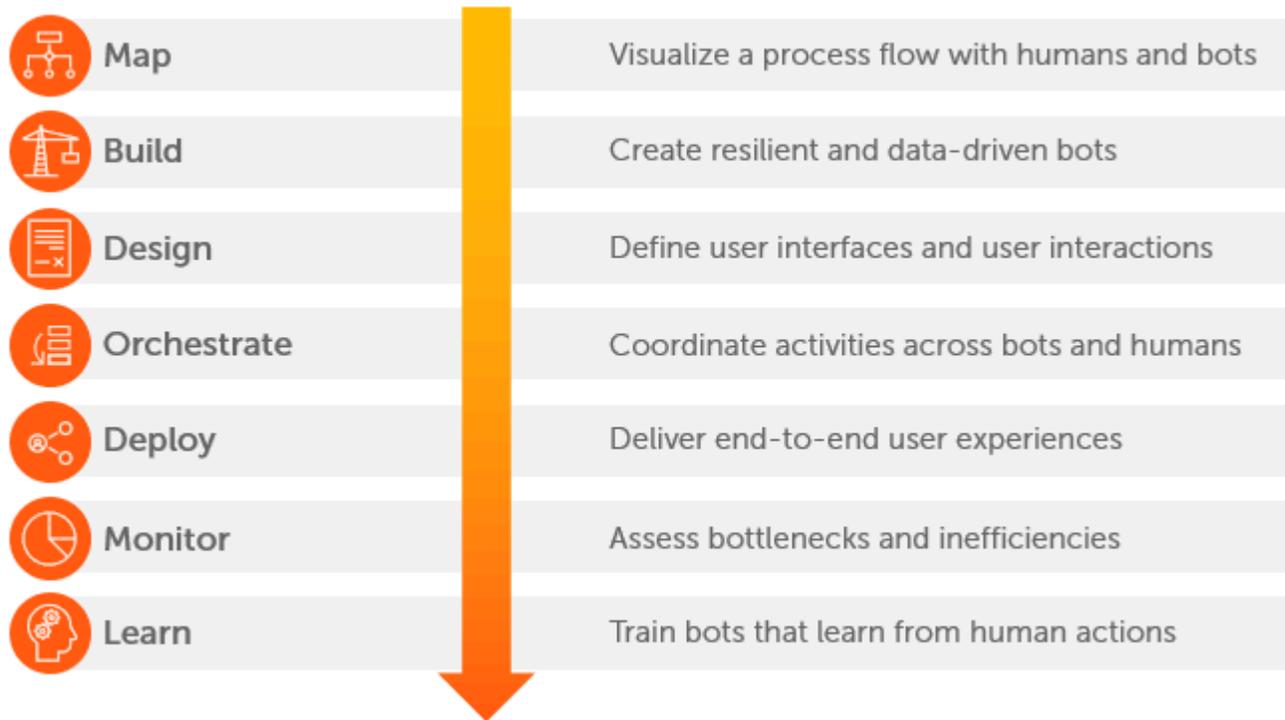
AARI helps you to achieve the following goals:

- Simplify everyday tasks, such as reporting and keeping track of urgent requests.
- Collaborate easily with your team's applications and bots, thereby improving average handle time and resolution rate, which helps improve customer satisfaction.
- Speed up even the most complex requests by automating escalations and approvals.
- Accelerate return-on-investment owing to minimal investment on infrastructure, training, and set-up costs for your enterprise.

### What you can do with AARI

AARI enables real-time communication between users and bots. By using AARI to automate repetitive and time-consuming tasks, you can improve customer experience, increase employee productivity, and cut operational costs for your organization.

The following image illustrates how AARI enhances automation.



## Accessing AARI

AARI provides various interfaces that you can use to connect to business workflows at multiple touchpoints. Access AARI in the following ways:

- Web browser

Access AARI through a URL to manage front and back office functions, gathering input and approval from a single interface. See [Using AARI on the web interface](#).

- Desktop

Retrieve and update data with custom forms. Users can view and interact with all data from a single screen instead of switching between multiple systems. See [Get started with AARI desktop](#).

- Applications

Execute bots from common enterprise applications such as Salesforce, Microsoft Excel, and G Suite through an embedded Automation Anywhere toolbar.

- [RPA Bots for Salesforce](#)
- [RPA Bots for Excel](#)
- [RPA Bots for G Suite](#)

- Mobile app

Start and stop bots and view analytic on your mobile device with the Automation Anywhere Mobile app. See [Automation Anywhere Mobile app](#).

## Attended and unattended automation

The Automation Anywhere RPA Workspace provides attended and unattended automation for users to create bots that can manage routine tasks efficiently. While users focus on critical inputs that require manual overview or approval, bots handle tasks such as gathering information across databases, validating data, or responding to chats.

### Overview

Collaboration between humans and software bots is called *attended automation*. As attended automation requires user supervision, it is best suited for use with smaller and more fragmented tasks. However, some tasks within a business process do not change a lot over time and might not require extensive user intervention, such as collecting data or retrieving information from multiple databases. When such tasks that require little or no user judgment are configured to trigger other bots, it is called *unattended automation*. Unattended automation is useful to perform privileged operations, requiring elevated permissions and credentials.

Automation 360 offers a combination of attended and unattended automation for a complete RPA solution with the following benefits:

- Automated integration between multiple applications or databases, reducing errors as very little user intervention is necessary.
- Access bots in real-time through an easy to use interface.
- Users can set up or change triggers to start bots based on real-time.

Watch the following video to understand attended automation:

### Related concepts

[Get started with AARI desktop](#)

Use Automation Anywhere Robotic Interface (AARI) through your desktop to manage routine tasks such as validating data, retrieving approvals, and managing escalations through bots.

## Private Bot Store

Private Bot Store is a secure internal bot marketplace for a company to post and share details and documentation for all internally developed bots. Employees can easily discover internal bots and commands to reuse in addition to all of the bots from the Automation Anywhere Bot Store vendors.

Use Private Bot Store to perform the following tasks:

- View, access, and reuse bots to automate processes:
  - Find and reuse bots built by your team
  - Use filters to search for bots by applications, business processes, or a keyword
  - Use bots from the Automation Anywhere Bot Store vendors
  - Review detailed documentation provided with each bot to decide whether to use the bot
- Submit details and documentation about your own bots
- Use the **Suggested bot idea** page to submit a bot idea

Use bots within your company:

- If required, email a bot developer for bot installation assistance
- Access bots in your Control Room
- Review and access your bots from the **My Bots** and **My Submissions** pages

Use admin tools to help you with the following tasks:

- Review, approve, and publish bots
- Review your team's bot use case ideas
- Add or remove users and assign permissions

Watch the following video on how to get started with Private Bot Store:

<https://www.youtube.com/embed/ZE5hxVQw-tY>

### **Related concepts**

#### [Getting started with Private Bot Store](#)

Use Private Bot Store to view and submit bots and bot use cases within your company. Use admin tools to review and publish bots and manage users.

## Security architecture

Many of the largest financial organizations in the world rely on Automation Anywhere's secure digital workforce platform to automate security-sensitive operations.

The platform's security architecture is founded on Least Privilege principles and a strict Separation of Duty model with 41 technical controls implemented across seven NIST 800-53r4 Control Families. Controls are applied across three components: the Control Room, Bot Creators (development systems), and Bot Runners (bot execution run times) through the bot life cycle from creation through decommissioning. This security architecture and the underlying controls are mapped to industry best practices as defined by NIST and can be readily mapped to other frameworks, for example, CoBIT (SOX) and ISO 27002.

### Access Controls. Automation Anywhere Enterprise (AAE)

Access Controls. Automation Anywhere Enterprise (AAE) limits and controls human and bot access to logical resources across components.

- Two independent control planes enforce least privilege. Only developers are enabled to read or write, only authorized Control Room users to execute automations, (Control Room authorizes and executes) subject to fine-grained Role Based Access Controls (RBAC) down to individual automations (bot), Bot Runners and domains.
- Bot-level Separation of Duty is enforced. Each bot is obfuscated and executed by its corresponding authorized Bot Runners.
- Bot execution is controlled via RBAC. Domain privileges are defined across groups of bot and Bot Runners.
- Security at-rest and in-transit. All access credentials are secured at-rest via a central credential vault with support for third-party credential stores. All communications are secured in-transit via SSL and TLS.

### Configuration management

Configuration management is controlled at both bots and Bot Runner levels.

- The Control Room authorizes, enforces, and logs changes to all Bot Creators and Bot Runners.
- Bot change control on execution is enforced through encryption and authentication.

## Identification and authentication

Identification and authentication is controlled through Microsoft Windows authentication services.

- Bot Creators use *Active Directory* for authentication
- Bot Runners have two levels of authentication, one for autologin authentication of the runner and the other for execution of bots.
- Credentials are secured at-rest and in-motion through the Credential Vault or integration with third-party products.

## Risk assessment

Risk assessment is undertaken on Static, Dynamic, and Network-based Vulnerability Assessments. Audit and Accountability are established through event capture, logging and auditing on all three components with granular event capture at the bot level and nonrepudiation. Bot Insight embedded analytics provides near-real-time Incident Response and integration with Security Event and Information Management systems.

### Related information

[RPA Security](#)

## Security architecture model

Automation Anywhere Cognitive security architecture is founded on Least Privilege principles and a strict Separation of Duty model with 41 technical controls implemented across seven NIST Control families.

The NIST framework was selected as a foundation for best practices as a way to enumerate the controls implemented throughout. Translations from NIST to other control frameworks are widely available, resources are provided at the end of this topic.

The product security architecture is maintained by the Automation Anywhere's Product Management team and forms part of a formal policy model as an integral part of the Automation Anywhere Development Roadmap. The following table lists the Control families and the corresponding features and security impacts. Details on each Control family and how the security architecture is implemented in Automation Anywhere products are in the corresponding topics.

Control Family	Control Code	Control Room Feature	Security Impact
Access controls	AC-3, 6, 7, 9, 10, 12	Central policy control	Enforce access restrictions for change control and least privileges on system components: <ul style="list-style-type: none"> <li>• Fine grained access to bots and Bot Runners is controlled via RBAC,</li> <li>• Bot and Bot Runner domains can be assigned to roles via RBAC</li> <li>• RBAC roles are fully audited</li> </ul>

Control Family	Control Code	Control Room Feature	Security Impact
	AC-2, 3, 5, 6	Role-based access control (RBAC)	Enable user access, restricts operational privileges, enforces least privilege principles
	AC-17	Bot repository	Bot versioning system with access restrictions
	AC-3, 7, 9, 10, 11	Bot and Bot Runner encryption	Encryption and obfuscation of sensitive information at bot level through credential vault and integration with key management systems
Configuration (change) management	CM-2, 5, 6, 7, 9	Centralized Bot Runner control	Restrict functionality based on roles, domains, implement deny-all and allow-by exception
	CM-10	Centralized licensing	Centralized provisioning, tracking and enforcement of Bot Creator and Bot Runner licensing
	CM-2, 5, 6, 8	Bot operations room	
	CM-8	Inventory control	Maintains centralized inventory control of all bots and runtimes
Bot Creator configuration management	SA-10	Bot Creator management, bot check-in, check-out	Control Room applies software life cycle management to bots from development, test, and production. Bot versioning enables change control of automations.
Audit and accountability	AU-1 through 15	Audit trail	Automated event logs captured on three levels: Control Room, Bot Runners, and Bot Creators. Non-repudiation is assured through read-only logs, all user identities are bound to actions.

Control Family	Control Code	Control Room Feature	Security Impact
Identification and authentication	IA-1 through 5	Active Directory integration, Bot Runner ID and Attestation	Implements Windows platform security including cryptographic bidirectional authentication, Bot Runner identification and attestation, and password management policies. Credential vault with integration with key management systems, protects the integrity of credentials.
Incident response	IR-4, 6	Incident response	Bot Insight embedded analytics capabilities can monitor events and generate alerts to SIEM systems for response.
Controlled maintenance	MA-2	Automated maintenance	Control Room versioning system provides an automated mechanism to roll out updates to bots, historical information is maintained.

(1) Resources: ISACA provides guides that map NIST SP800-53 to other security frameworks such as CoBIT (SOX), SANS Top20 (<http://www.counciloncybersecurity.org/critical-controls/tools/>) and ISO27002 (<http://www.bankinfosecurity.in/mapping-nist-controls-to-iso-standards-a-7251>).

## Cloud operational responsibilities

Learn about secure deployment models, data element locations, and operational responsibilities.

### Securing the Cloud

Automation Anywhere Cloud is deployed to only allow access to Automation Anywhere Cloud Operations personnel and Security Team resources. Network and cloud control plane access is restricted using VPN with multi-factor authentication for AAI operational and security personnel. All AAI users must first authenticate using MFA tokens to retrieve short-term credentials to access cloud resources. User credentials are continuously monitored for compliance. All other operational users, cloud resources, and applications are restricted from access to the Control Room. Regular AAI user access certification is conducted to ensure only necessary access is provided to cloud operations personnel.

The cloud service is multi-tenanted and each customer control room environment uses a unique tenant identifier to ensure data separation between the Control Rooms. Automation Anywhere members cannot access a customer environment unless specific permission is provided by the customer, typically under support troubleshooting procedures and controls.

#### Cloud

With the Automation AnywhereCloud offering, all business, personal, and operational data is stored

on Automation Anywhere administered cloud. Automation Anywhere is the cloud data controller and is responsible for customer data privacy as published in accordance with Automation Anywhere cloud security and compliance with data privacy.

*Cloud Security and Compliance with Data Privacy*

**Cloud-enabled**

With the Automation Anywhere Cloud-enabled solution, business, personal, and operational data is stored and managed on the customer-controlled infrastructure, while specific operational data related to RPA is shared between the Automation Anywhere Cloud and the customer infrastructure. All data privacy and compliance rests with the customer.

**On-Premises with updates through Cloud**

With Automation Anywhere On-Premises with updates through Cloud service, all business, personal, and operational data is kept on and deployed from the server on-premises on the customer network. All data privacy and compliance rests with the customer.

The following table lists the securing data and operations responsibilities:

<b>Data requirement</b>	<b>Cloud</b>	<b>Cloud-enabled</b>	<b>On-Premises with updates through Cloud</b>
Infrastructure and data security	Automation Anywhere Cloud	Shared customer and Automation Anywhere Cloud	Customer
Continuity and disaster recovery	Automation Anywhere Cloud	Shared customer and Automation Anywhere Cloud	Customer
High availability	Automation Anywhere Cloud	Shared customer and Automation Anywhere Cloud	Customer
Data localization	Automation Anywhere Cloud	Customer	Customer
Data privacy	Automation Anywhere Cloud	Customer	Customer
Software upgrades	Automation Anywhere Cloud	Shared customer and Automation Anywhere Cloud	Customer

The following table lists data types and storage locations:

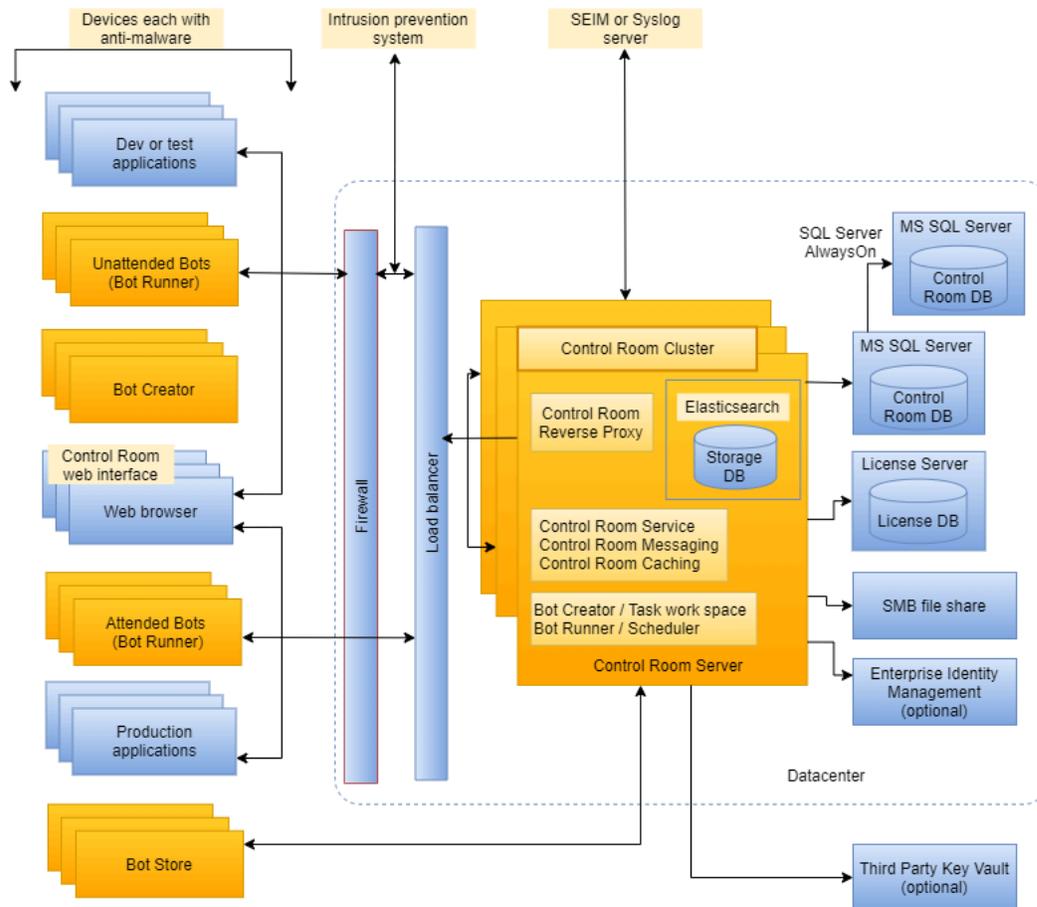
Data type	Cloud	Cloud-enabled	On-Premises with updates through Cloud
<b>Customer business data</b> <ul style="list-style-type: none"> <li>Customer personal data</li> <li>Business data used in automation</li> </ul>	<b>Cloud</b>	<b>Customer network</b>	<b>Customer network</b>
<b>Operational data</b> <ul style="list-style-type: none"> <li>Operations users, roles, passwords</li> <li>Device information</li> <li>Device credentials</li> <li>Bot schedule</li> <li>Bot definition</li> <li>Audit and application logs</li> <li>WLM definitions and schedules</li> </ul>	<b>Cloud</b>	<b>Customer network</b>	Management shared: <b>Cloud</b> Action package updates <b>Customer</b> All other data management
<b>Personal data</b> <ul style="list-style-type: none"> <li>Username and password</li> <li>Security key</li> <li>User device information and credentials</li> <li>Bot Runner device access</li> <li>Bot device IP/FQDN</li> <li>Bot application credentials</li> <li>User application logs</li> </ul>	<b>Cloud</b>	<b>Customer network</b>	<b>Customer network</b>

## Securing the RPA environment with external controls

The Automation Anywhere architecture consists of a standard desktop and server class infrastructure for the registered devices and the Control Room.

### RPA platform

This topic details the best practices for securing the RPA platform with external security controls. Network-based firewalls, Intrusion Detection Systems, anti-malware, and external log servers are all standard security controls that are relevant to RPA deployment and the other infrastructure in your environment. The following figure shows logically where these components are deployed in the RPA deployment:



In the image, Control Room components are shown in orange and data center components provided by your organization are shown in blue.

Each external security control is discussed in detail in the following sections, in terms of placement and configuration. Supporting network services such as Active Directory, SMB File Share, Microsoft SQL Server, and production applications, and are accessed through network firewalls or directly, depending on their placement relative to the RPA components.

## Network-based access control to protect RPA with firewalls

Network-based firewalls and local server-based firewall are used to protect the Control Room or all nodes in a Control Room cluster. By default, required protocols on the Control Room are permitted from the corporate network. Additionally, all clustering protocols are permitted only between the nodes in the Control Room cluster. Network-based firewalls are used to isolate Development, Test, and Production RPA environments from the corporate network and from each other.

For unattended automation environments, the Bot Runners are placed in a specific isolated network and protected by a network-based firewall. Attended automations run from corporate workstations with the Bot Runner Bot agent installed and are protected via the corporate perimeter firewalls or internal firewalls protecting the corporate desktop infrastructure, like any desktop.

## Anti-malware to protect RPA from viruses and malware

The Automation Anywhere Bot agent runs on desktop class infrastructure and is considered a corporate desktop. Anti-malware or anti-virus software is used to protect the registered device environment from malicious software in the form of viruses and malware.

## Intrusion detection systems to protect RPA from direct attacks

Intrusion Detection and Prevention Systems (IPS) protect the corporate network by detecting network-based attack through network traffic analysis. Like any other critical section of the data center, an IPS protects the RPA platform at the egress point, behind the network-based firewall.

## Independent categories for Bot Creators and Bot Runners

For logical separation of duties, Control Room divides automation users into two broad categories: Bot Creators (development) users and Bot Runners (run-time) users.

Bot Creators exist on a separate Microsoft Windows system with its own credentialing system to create, update, and unit test the bots on the Bot Creator. Bot Creators only upload and download bots to and from the Control Room. Users on the Control Room users have privileges to execute bots on Bot Runners but have no access to the Bot Creators. This separation of duty constitutes a dual authorization by requiring both the developer and the business user to create and execute the bot in conformance with NIST AC-3 best practices.

## Role-Based Access Control

Control Room implements Least Privileges and Separation of Duties through a configurable Role-Based Access Control (RBAC) capability that conforms to requirements in NIST AC 2, 3, 5, and 6.

All Control Room users are assigned one or more roles. Access are available based on the usage conditions assigned to each role when users are a member. Authorized users can temporarily or permanently suspend other users when needed. RBAC enforces session handling to prevent unauthorized access. If an unauthorized user attempts to view session details or gain access, the Control Room cluster will prevent this progress and immediately terminates the unauthorized session. The unauthorized user will be prompted to log in with valid credentials. Inactive accounts can be disabled.

The administrator controls are responsible for all security functions, consistent with best practices in NIST SC-3: Security Function Isolation.

The Control Room includes segmented administrator roles by default. Many permissions are supported for creating new roles.

Controls are implemented at the Control Room, Bot Creators, and Bot Runners layers, for NIST Access Controls (AC) and Change Management (CM) guidelines. The following technical controls are implemented to ensure access is governed through NIST Least Privileges.

## RBAC on bots

Access is deny all and allow by exception based on roles, except for admin roles. Addressing NIST AC-17 (access control), NIST configuration managements for NIST CM-2 (base line configurations), access restrictions for NIST CM-5, NIST CM-6, and NIST CM-7 (least functionality), and monitoring NIST CM-9 for bot activity across the development, test, and production environment.

## RBAC on Bot Runners

RBAC on Bot Runners facilitates complete isolation of one department Bot Runner seamlessly from the remaining departments' Bot Runners.

Bots are executed from the Control Room cluster. Local bot executions are protected through multiple layered security, and are designed to prevent fraud as a result from escalation of privileges on Microsoft Windows. The Bot Runner are executed by Windows, addressing access control enforcement in accordance with NIST AC-3 Access Enforcement and AC-6 Least Privilege for Code Execution.

If user roles does not have access to sets of Bot Runners, as a result, these users are unable to view the Bot Runners' executions or remote scheduling automation. See ([Role-based processing domains](#)).

## RBAC for Credential Vault credentials management

Credentials created in the Control Room are used across Bot Creators and Bot Runners.

These credentials are securely stored in the centralized Credential Vault to facilitate access control, and to divide in logical groups called lockers. These lockers enable complete separation between the credentials of one department from another.

### Role-based permissions

Permissions for credential management-related roles include the following:

#### **Manage my credentials and lockers**

By default, all users can manage their own credentials and interact with the lockers to which they have permissions.

#### **Manage my lockers**

Allows the user to create and manage their own lockers.

#### **Administer ALL lockers**

User can do all the actions in the Admin row of the Locker permissions table below.

#### **Create standard attributes for a credential**

User can set an attribute value that remains the same for other users of that credential attribute.

### Locker permissions

Locker permissions are set when a locker is created or edited. A user can have the following permissions in a locker:

	View locker	Edit locker	Delete locker	Add participant owner	Remove participant owner	View credential	Assign credential	Remove credential	User-provided value	Standard value
Consume						#			#	
Participate						#	#			
Manage	#	#	#			#	#	#		#
Own	#	#	#	#	#	#	#	#		#
Admin	#	#	#	#	#	#	#	#		#

**Related tasks**[Create credential](#)

Create a credential and add the required attributes.

[Create locker](#)

Create a locker to group similar credentials to share with other users.

**Related reference**[Credentials and lockers in the Credential Vault](#)

The Credential Vault securely stores sensitive information such as passwords, account numbers, and social security numbers in credentials and lockers for use in automation tasks. It facilitates role-based access for users of a Control Room and ensures that sensitive values are not stored in bots or on devices.

## Role-based processing domains

The Control Room RBAC applies the least privilege principles to domains by implementing Processing Domains, specifying role-based privileges and permissions at the bots and Bot Runners level.

RBAC is applied at a folder level to completely and seamlessly isolate one department bot from the remaining department bots. If the user role does not have access to a set of bots, those bots do not exist, thereby enabling the separation of duties across different domains. For example, finance and accounting roles can access only the bots that automate their respective functions, and specific Bot Runners can execute these bots. This is consistent to best practices as defined by NIST AC-4 Processing Domains.

This permission is further divided into the following sub permissions:

**Run**

Only those users who have this permission can run bots from the Control Room to remote Bot Runners.

Authorized users assign various permutation and combinations of these accesses to different sets of users and roles based on the business need.

## RBAC on Audit Log

Audit is automated for all privileged and nonprivileged roles to conform to best practices, as defined in NIST AC-6.

Access is view-only based on a deny all and allow by exception based on roles and domains as defined in the Audit section 7 addressing Audit and Accountability (NIST AU 1 through 15) and as required by NIST AC-2 Automated System Account Management. If a role does not have permission to view Audit Logs, then the Audit Trail tab is not visible to all members of that role. Audit automatically captures all events related to creation, modification, enablement, disablement, and removal of users, bots, Bot Creators, and Bot Runners.

## RBAC on viewing bot activity

The **Activity** menu provides options shows the status of the automations. These options are: **In Progress**, **Scheduled**, and **Historical**.

Access to Activity status is deny all and allow by exception based on roles and domains as defined in RBAC. Two levels of checks are applied to access the Activity data. The user is required to be a member of a role that has access to view the . Users with access that can view only the belonging to their departments, as applied through RBAC on .

## RBAC on User Management

Access is deny all and allow by exception based on roles, domains as defined in RBAC. Only those users with access to User Management can manage other users in system.

This permission is further divided into the following sub permissions:

<b>Create Users</b>	Only those users that create new users from the Control Room.
<b>Edit Users</b>	Only those users that edit existing users from the Control Room.
<b>Delete Users</b>	Only those users that delete existing users from the Control Room.

Authorized users assign various combinations of these access permissions to different sets of users and roles based on the business requirements.

## RBAC on roles and permissions management

Access is deny all and allow by exception based on roles, domains as defined in RBAC.

Users with access to roles and permissions management can create, edit, and delete roles in the system. This permission is typically assigned to administrators and power users from across enterprises.

## RBAC on bot schedules

Access is deny all and allow by exception based on roles and domains as defined in RBAC.

This permission is further divided into the following sub permissions:

<b>Schedule my bots to run</b>	Only those users that create new schedules.
<b>Edit my scheduled activity</b>	Only those users that edit their schedules.
<b>Delete my scheduled activity</b>	Only those users that delete their schedules.
<b>View and manage ALL scheduled activity</b>	Only those users that manage (edit or delete) all the existing schedules created by any user.

Administrators assign various permutation and combinations of these accesses to different sets of users and roles based on the business requirements.

## RBAC on license management

Access to license management is deny all and allow by exception based on roles and domains as defined in RBAC.

Only those users with access to license management permission are able to update the license from the Control Room. A common license exists for all the users across Automation 360 for a specific Control Room. The updated license is effective for all the Bot Creators and Bot Runners registered with the corresponding Control Room.

## Bot execution access by dynamic access token

The Control Room implements and enforces a Trusted Path for registration and authentication of Bot Creators and Bot Runners in accordance with NIST SC-11 to protect against any attempt to execute unauthorized bots.

The Control Room issues new client access tokens or identifiers through hashing, signed by the Control Room and sent to Bot Creators and Bot Runners over HTTPS. Every subsequent communication between Control Room and Bot Creator or Bot Runner is serviced by the Control Room after validation of the signature of the latest access token sent by the Bot Creator or Bot Runner. Each access token is unique to every Bot Creator or Bot Runner. This ensures that even if an unauthorized user could bypass enterprise security and access the system, the Control Room security restricts any damage.

## Secure credential store through Credential Vault

The Automation Anywhere platform provides a centralized Credential Vault to securely store all credentials and provision them to bots on an on-demand basis.

Use the Credential Vault to store other information deemed confidential or sensitive. The credential store implements NIST controls IA-2 to uniquely identify and authenticate organizational users (or processes acting on behalf of organizational users).

Sensitive information does not have to be stored in bots or on Bot Runner systems, the Credential Vault facilitates a logical separation of credentials from the bots.

Credential Vault variables (credentials) are created in the Control Room. They are available to the Bot Creators and Bot Runners who are assigned roles that provide them access to the lockers that contain the credentials.

The Credential Vault adds flexibility and dynamic character to bots because only the credential references are present in the bots, and not the credentials. When bots are moved from one environment to another environment, absolutely no change is required in the bots. Bots can seamlessly pick up the credentials values applicable for the new environment from the Credential Vault of that environment. Additionally, the Control Room automatically stores configuration-related sensitive data into the Credential Vault by default.

## Credential Vault encryption

The Automation Anywhere Control Room installation generates the Master key and Data encryption key.

The Automation Anywhere Control Room installation generates the following two keys:

### **Master key**

This RSA-2048 bit key is managed by an administrator outside of the system. This key unlocks the Credential Vault. The administrator types the Master key each time the Control Room is started. When the vault is open, the master key is immediately erased from memory and it is not stored anywhere in the Automation Anywhere product.

### **Data encryption key**

This AES-256 bit key is stored in the Control Room database and is used to encrypt and decrypt the credentials at the time of storage or provisioning. This key is encrypted using the Master key. The Data encryption key does not leave the Credential Vault at any time. Credential encryption and decryption are done at the Credential Vault.

## Credential storage

All sensitive data is stored in the Credential Vault using AES-256 encryption.

These credentials are encrypted by the Credential Vault service to conform to NIST SC-28 and to prevent unauthorized access or disclosure of credentials. Only encrypted credentials travel from the Control Room to the Database server and are stored in the database in an encrypted form. The data encryption key encrypts all credentials using an AES 256-bit key generated by a FIPS 140-2 Level 1 validated module to meet the NIST IA-7, SC-12, and 13 requirements for implementation of mechanisms for authentication to a cryptographic module that meets the requirements of applicable federal laws.

The data for *Active Directory* user credentials for autologin to Bot Runners is also encrypted and securely stored in the Credential Vault with the bot credentials.

## Credential provisioning to bots

Credentials are provisioned only during the execution of automation.

Bot Runners or bots do not store credentials locally. Credentials are provisioned only during the execution of the automation. When the credentials are requested by Bot Runners, encoded (64 bit) credentials travel from the Control Room to Bot Runner over HTTPS protocol. When the bots finish execution, credentials are erased from the memory.

## Cryptographic providers

Use only the listed supported cryptographic providers.

### Control Room

<b>AES256</b>	Bouncy Castle FIPS 1.0.2
<b>RSA2048</b>	Bouncy Castle FIPS 1.0.2
<b>HMACSHA256</b>	Bouncy Castle FIPS 1.0.2
<b>PBKDF2 + HMACSHA512</b>	Bouncy Castle FIPS 1.0.2

## Authentication with Control Room

When a Bot Creator or Bot Runner tries to connect to Control Room, the credentials are encrypted using AES (256 bits key length) and RSA (2048 bits key length) and then transmitted on top of the existing layer of Transport Layer Security (TLS).

This extra layer of message level encryption provides protection against network stack issues (such as Heartbleed where OpenSSL was leaking sensitive data from memory) and also adds protection to the last hop of the connection when TLS is terminated at the load balancer. These credentials are decrypted by Control Room and authenticated against the hashed (PBKDF2 and HMAC SHA512 algorithm) user passwords or against *Active Directory* via Lightweight Directory Access Protocol (LDAP).

## Supported authentication methods for Automation 360 On-Premises

Review the authentication methods supported by Automation 360 On-Premises.

### Supported authentication methods

- [Active Directory](#) using LDAP
- Active Directory using Kerberos
- SAML
- Local authentication using a database

The benefits of integrating with Active Directory include the following:

<b>Easier adoption</b>	Integrates with an existing authentication solution, compliant with the standards.
<b>Maintenance</b>	All passwords and password policies are centrally administered.
<b>Better user experience</b>	Fewer passwords to remember.

Kerberos provides additional benefits over NTLM pass-through authentication.

- Open standard versus closed proprietary standard
- Mutual authentication of client and server
- Integration with smart cards for 2FA

Local authentication manages user passwords through the Credential Vault. Passwords are hashed using the HMACSHA512 algorithm, which is keyed by the output of the Password-Based Key Derivation Function (PBKDF2). User passwords are encrypted in transit through TLS 1.2.

All authentication and session management is handled through the well-tested Spring Security framework. Kerberos integration is provided through the well-tested Waffle framework. SAML integration is provided through the well-tested OneLogin framework.

### Active Directory integration for authentication

Automation Anywhere offers seamless integration with Microsoft Windows Active Directory for access to the Control Room, Bot Creators, and Bot Runners. When Control Room is integrated with the Active Directory, all the Active Directory users with basic details are directly available in the Control Room without any extra configuration. For Active Directory integration, user passwords stay in only Active Directory and are not saved in the platform.

In addition to Active Directory authentication, the Control Room has its own controls to prevent unauthorized access to an [Dynamic access token authentication of Bot Runners](#) automation data.

#### [Dynamic access token authentication of Bot Runners](#)

Bot Runner users can also configure their [Active Directory](#) credentials for Bot Runners machine autologin. These credentials are saved in the centralized Credential Vault.

### Multi-domain Active Directory support

Automation Anywhere platform architecture supports single-forest multi-domain Active Directory integration. Automation 360 On-Premises can be configured with Active Directory global catalog server

in a way that the Control Room, Bot Creators and Bot Runners can all be in the same or different Active Directory domains of a single forest. This gives added flexibility and control for large-scale complex deployment where users are spread across geographies.

Multi-domain support is provided out of the box and no additional configuration is required. The Automation 360 On-Premises user provisioning from different Active Directory domains is also seamless. It enables the Automation 360 On-Premises admin to centrally orchestrate the digital workforce running across the globe.

## Support for secure protocols

The Automation Anywhere platform supports secure protocols, for example, TLS 1.2 and HTTPS data transfer.

- Deployment of bots from the Control Room to remote Bot Runners is done over TCP and TLS 1.2.
- Upload and download of bots from the Bot Creator to the Control Room is done over HTTPS.
- Transfer of any information from the Control Room to the database and vice versa is done over TDS and TLS 1.2.
- Transfer of encoded credentials from the Control Room to Bot Runners is done over HTTPS.
- WebSocket communication with the real-time data service in the Control Room is done over HTTPS.

## Network security overview

All communication between the Control Room, Bot Creators and Bot Runners is done using outbound WCF TLS 1.2 communications and inbound HTTPS TLS 1.2.

Bot deployment to remote bot runners, provisioning of credentials, automation scheduling, and event capture are done exclusively through the Control Room. Use only HTTPS in the production environment.

- The REST APIs use Distributed Cache Service to get shared cached data required for specific functionality.
- The Scheduler Service makes REST API calls to run a task on a specific client machine at a specific time.
- Real-time Data Service makes REST API calls to authenticate incoming connection requests. It receives task execution progress updates by Bot Runners and sends that information to all connected browser clients using WebSocket Secure (WSS) protocol.
- The Control Room makes REST calls for user authentication and repository operations, for example, upload a task, download a task, or compare two tasks.
- The Control Room makes REST calls to the validate user session at regular intervals. The Control Room deploys and runs a task on a specific device using Bot agent. It uses a TCP/IP channel.
- The Scheduler Service makes REST calls for autologin credentials. It also communicates to the Control Room to get a license and user session-related information.
- The Control Room makes REST calls to get autologin credentials for a logged-in device. It also communicates to the Control Room to get the license and user session-related information.

## Change management

Access restrictions for configuration management.

### Baseline inventory controls for Bot Creators, Bot Runners and bots

The Control Room provides a single-pane-of-glass on all automation operations and infrastructure, providing a way to baseline the configuration of the environment. Inventory controls are maintained through the application of RBAC and the use of the Bot Repository, Operations Room, and License Management to establish a single point of control for Base Line Configurations (NIST CM 2) access restrictions for configuration management (NIST CM 5 and 6). Configure automated baseline reporting using the auditing and reporting systems in the Control Room.

### Change control and documentation RBAC

The Control Room RBAC provides a point of access control and management for all changes to the Control Room, Credential Vault, Bot Creators, bots, and Bot Runners with an automated mechanism to prohibit changes and report on any attempts to make unauthorized changes. The logging and auditing system on the Control Room provides the reporting mechanism for change management to conform to best practices as described in NIST CM-3 through 5.

### Software usage and license management

The Control Room provides an automated mechanism for tracking and controlling the use of licensed software across Bot Creators and Bot Runners, addressing NIST Change Management CM 10.

### Dual authorization change management

Separation of duties is implemented at multiple levels. Dual authorization is achieved through separation of control planes for the Bot Creators and Bot Runners. Only bots created by an authorized Bot Creator can be executed by a separately authorized Bot Runner and only by a user who has been given the privileges to do so by an administrator.

## Identity and authentication

All automation actions, for example, create, view, update, deploy, and delete, across Automation 360 are done only after Control Room authentication is successfully completed.

After authentication is successful, the platform applies a second mandatory level of access control enforcement in the form of fine-grained Role-Based Access Control (RBAC).

The Control Room has its own controls to prevent unauthorized access to any automation data.

*Dynamic access token authentication of Bot Runners.*

## Password hashing

Password hashing does a one-way, permanent transformation of the passwords of the Control Room users, inline with standard password management practices.

Control Room passwords are concatenated with a salt and then hashed using the PBKDF2WithHmacSHA512 algorithm before being stored in the database.

- The salt is 256 bits in size and is randomly generated by a cryptographically secure PRNG.
- The HMAC SHA512 algorithm is used for hashing and provides additional security over traditional approaches.
  - A keyed hash provides protection against hash length extension attacks.
  - SHA 512 bit key is larger than the commonly used SHA 256 bit key.
- The key used for the HMAC is from the secure Password-Based Key Derivation Function (PBKDF2).
- Hashing is done for 100,000 rounds (based on NIST recommendations).

Every time a Bot Creator or Bot Runner authenticates against Control Room, its credentials are authenticated against the hashed credentials.

## Authentication failure messages

If an authentication attempt fails, the Automation 360 platform does not specifically state if the username or password is incorrect. It only states that the supplied credentials are incorrect.

This is one critical information security requirement for Automation Anywhere customers and defends the system against a brute force attack.

This authentication involves the following:

- Bot Creator, Bot Runner connection to Control Room
- User log in to the Control Room from the browser
- Connection from the Control Room to the SQL Server

All failed authentication attempts are logged. See [Audit logs](#). Audit Log access is provided as per RBAC and audit logs are made available on a read-only basis for all users.

## Authentication for Bot Runners

Two layers of authentication are present for deploying the bots on remote Bot Runners.

The Bot Runner is logged on/connected/unlocked using the configured credentials. These credentials are fetched from the centralized Credential Vault over HTTPS. This first level of authentication is done against the *Active Directory* domain automatically, on behalf of the user and is called Bot Runner autologin.

After being authenticated, Bot Runners can be authorized to execute bots independently and asynchronously.

The following table shows what happens to the user session on the Bot Runner after bot deployment.

User session status before bot deployment	During deployment	User session after bot execution finishes
No session exists	Create a new session and deploy the bot	Log off
Unlocked	Deploy the bot	Session remains unlocked
Locked	Unlock the session and deploy the bot	Session is relocked

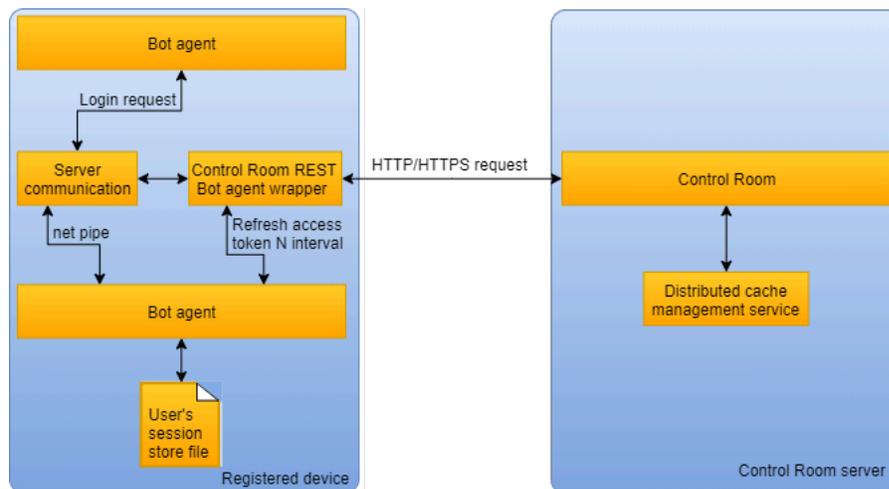
User session status before bot deployment	During deployment	User session after bot execution finishes
Disconnected	Unlock the session and deploy the bot	Log off

## Dynamic access token authentication of Bot Runners

The Control Room implements and enforces a Trusted Path for registration and authentication of Bot Creators and Bot Runners in accordance with NIST SC-11.

The Automation 360 platform protects the automation data against any attempt to subvert the path. The Control Room issues new client access tokens, or identifiers, after a predefined time period. These tokens are protected to conform to NIST IA-5 by being signed by the Control Room and sent to Bot Creators and Bot Runners over HTTPS. Every subsequent communication between the Control Room and Bot Creator/Bot Runner is serviced by the Control Room only after validation of the signature of the latest access token sent by the Bot Creator/Runner.

The access token is unique to every Bot Creator/Bot Runner. This protects the system from an unauthorized attempt to bypass security and execute an unauthorized bot, and is consistent with the best practices to conform to NIST IA-9 Service Identification and Authorization. These controls implement IA-3 for cryptographically based bidirectional authentication and attestation of Bot Runners and Bot Creators before establishing connections. This also addresses requirements around unique, automated, identifier management IA-4 for multiple forms of authorization and identification. Identifiers are dynamically managed for audit and control purposes. Identifiers are used as authenticators and managed for verification on initial deployment, revoke, and prevent reuse. There are no static, unencrypted, identifiers in use by Bot Creators or Bot Runners and cached tokens are cleared periodically.



## Defenses against common vulnerabilities

The Automation 360 platform provides some defenses against common attacks on applications.

The list below contains several examples of these attacks and the security controls in place to prevent them.

## SQL Injection (SQLi)

SQL injection is a high-risk vulnerability that can seriously impact the confidentiality, integrity, and availability of a database. It enables an attacker to execute any SQL of his or her choosing inside the DB, thus allowing them to read sensitive data, modify/insert data, and execute various operations.

The Control Room prevents SQL injection using query provided by the Hibernate framework.

## Cross Site Scripting (XSS)

Cross-site scripting is a high-risk vulnerability that can seriously impact the confidentiality, integrity, and availability of any user web session. It enables an attacker to execute any JavaScript inside the victim's browser, allowing them to spy on the user's input/output or take unauthorized actions on behalf of the user. They could also redirect the user offsite to a malicious malware download or a credential phishing page.

The Control Room prevents cross-site scripting using automatic output encoding provided by the ReactJS framework.

## OWASP Top 10

Automation Anywhere provides the following controls to protect against the OWASP Top 10:

Risk	Control
A1: Injection	All input is escaped before commands or queries are executed.
A2: Broken authentication and session management	See the identification and authentication section.
A3: Cross-site scripting	All output is encoded before being returned.
A4: Insecure direct object references	Centralized authorization via Spring Security.
A5: Security misconfiguration	No default passwords, stack traces hidden, secure server configuration
A6: Sensitive data exposure	See the Security at rest and Security in motion sections
A7: Missing function level access control	Centralized authorization via Spring Security
A8: Cross-site request forgery	Using authorization HTTP header
A9: Using components with known vulnerabilities	Black Duck software composition analysis tool
A10: Unvalidated redirects and forwards	N/A - No redirect functionality present

## Compliance and vulnerability scanning

Review details about Automation Anywhere compliance and vulnerability scanning.

### Secure software development life cycle (S-SDLC)

Automation Anywhere has implemented a development security plan and protocol that defines a specific depth of testing and evaluation to be done by the Engineering team on each release, conforming with best practices as defined by NIST SA-11 Developer Security Testing and Evaluation and NIST SA-15, Development Process, Standards, and Tools. This plan has been documented and shared with the Automation Anywhere Engineering teams.

### Veracode vulnerability scanning for static and dynamic code analysis

In each weekly build, during the development process and before every release, all Automation Anywhere software is scanned for flaws using the Veracode tool. Automation Anywhere Enterprise meets the requirements for the strictest security policy available in the tool, Veracode Level 5, which is defined as no Very High, High, or Medium severity vulnerabilities. Analysis reports are available with each release.

### Dependency analysis

In each weekly build, during the development process and before every release, all of the third-party libraries and dependencies in Automation Anywhere software are scanned for known vulnerabilities using the Black Duck tool. Automation Anywhere upgrades vulnerable libraries when new versions become available. Analysis reports are available with each release.

All Critical/High vulnerabilities are fixed for each release. Medium vulnerabilities will be considered for fixes in future releases depending on the scope of the Automation Anywhere releases. The list of OSS used by the application is published for each release.

### Penetration testing

Automation Anywhere does a penetration test through a third-party vendor before each major release. Additionally, Automation Anywhere incorporates the feedback from penetration tests conducted by customers, which includes some of the largest financial institutions in the world. Analysis reports are available with each release.

## Audit logs

The Automation 360 platform provides a comprehensive and centralized audit logging of all automation activities to authorized users. Role-based access control to Audit Log is managed through the Control Room. More than 60 audit actions are logged.

All valid and invalid attempts of actions are logged. Events are logged by the following factors:

<b>Doer of the action</b>	For example, a username.
<b>Source of the action</b>	For example, Bot Runner or Control Room
<b>Type of event</b>	The description of the event.
<b>When the event occurred</b>	For example, the date and the time of the event.

<b>Where the event occurred</b>	The device.
<b>Outcome of the event</b>	Description and status of the event.

Some key audit actions include the following:

- Log in and log out of the centralized Control Room.
- Create, update, and delete Users.
- Activate and deactivate the Control Room users.
- Any change of password for any user
- Create, update, and delete roles (helps in tracking changes to security policy, change in user access privileges)
- Create, update, and delete schedules
- Connection to the Credential Vault
- Create, update, and delete credentials
- Deploy the bots from the Control Room to the remote Bot Runners.
- Pause, resume, and stop the ongoing automations.
- Any upload and download from Bot Creators and Bot Runners
- Any check-in, check-out of bots from Bot Creators and Bot Runners
- Update email and other settings
- Enable and disable secure recording.
- Change a license.

## RBAC on audit log

Audit is automated for all privileged and nonprivileged roles to conform to best practices as defined in NIST AC-6. Access is view-only based on a deny-all and allow by exception based on roles and domains as defined in the Audit Section 7 addressing Audit and Accountability (NIST AU 1 through 15) and as required by NIST AC-2 Automated System Account Management.

If a role does not have permission to view Audit Logs, the Audit Trail tab is not visible to all members of those roles. Audit automatically captures all events related to creation, modification, enable, disable, user removals, bots, Bot Creators, and Bot Runners.

## Control Room Bot Creator and Bot Runner activity logging

For every Bot Creator and Bot Runner, the Automation Anywhere Enterprise platform does comprehensive activity logging for bots, workflows, and reports.

Some of the key activities logged include the following:

- Task creation, update, deletion (task is a type of bot).
- Task run
- Workflow creation, update, deletion
- Workflow run
- Report creation, update, deletion
- Report run
- Change in bot properties

## Audit of Bot Runner operations

Bot Insight captures additional Bot Runner events for review and analysis of audit records for indications of inappropriate or unusual activity. The Bot Insight logs can be exported for further analysis. Automated dashboards and reports are available and can be customized to identify and alert on anomalous activity. These capabilities conform to best practices as defined in NIST AU-6 Audit Review Analysis and Reporting.

## Audit log nonrepudiation

The logs are protected against an individual (or process acting on behalf of an individual) falsely denying having done authorized actions through read-only privileges, automated event capture, and binds the identity of the user to the actions, in conformance with best practices as defined in NISGT AU-10 Non-repudiation and AU-11 Association of Identities.

## Export audit logs

All Control Room and Bot Insight Bot Runner logs are exported to a Security Event Information Management Systems for further analysis to support the organizations incident response efforts in accordance with the NIST AU-6 and IR-5 requirements.

## Additional security controls

Automation Anywhere Control Room restricts the database connection configuration with the system administrator account.

## Restrict installation from database system administrator account

All the database level transactions are done with a nonsystem administrator account. The Control Room installer passes the SQL Server 2012 certification test.

## Autolock the device

When Automation Anywhere bots are deployed from the Control Room to remote Bot Runners, they revert the Bot Runner system to its original state. For example, if the Bot Runner machine was logged off and our bot logged into the machine, it logs it off after the automation execution finishes. This ensures that system level security is not compromised.

## Using SHgetKnownFolderPath function

Automation Anywhere software uses the SHGetKnownFolderPath function and Knownfolder\_ID to determine the full path to the special folders. This is a recommended practice from Microsoft and use of this function ensures that system will never redirect automation data to any other folder, even if someone attempts to hack the function call. This is also one of the InfoSec requirements of Automation Anywhere customers.

## API level security

Automation Anywhere software does authentication and authorization level checks at the API level. API calls are serviced only for those users who have permission on the automation data. Unauthorized users cannot bypass system security through rogue API calls.

## Clean uninstall

When Automation Anywhere Enterprise client software is uninstalled, it leaves no trailing files or folders behind. This clean uninstall of the Enterprise client software complies with InfoSec policies.

## Store data in Program Data folder

Automation Anywhere software allows storing of automation data in the Program Data folder, for the files which must be edited by end users. Permissions are also set on the directory during the installation so that the user can edit the content of the folder. This complies with the InfoSec requirements of Automation Anywhere customers.

## Protected handling of MSVC DLL files

Automation Anywhere Enterprise client software uses MSVCxxx.dll files for automation purposes, but it does not install these files by itself. Client software directly uses the DLL files installed by only the Microsoft operating system. This ensures that client software does not overwrite the DLL files installed by Microsoft and our customers do not have to worry about doing one more cycle of checking for any introduced vulnerabilities.

## Assembly manifest

All the executables (.exe file) of the Automation Anywhere Control Room and Enterprise client software contain the manifest files which describe assembly metadata, for example, filename, version number, and culture. This makes our platform comply with organizational InfoSec policies.

## Application path on network

Automation Anywhere supports configuration of reading and writing automation data to a location on a network drive. This enables users to keep all automation data at one place.

## Autologin without disabling legal disclaimer

When Automation Anywhere bots are deployed from the Control Room to remote Bot Runners, our customers do not need to change security settings, for example, disable login page, disable legal disclaimer, or disable screensaver. Automation deployment works seamlessly without disabling these settings.

## Secure Java automation

The Automation Anywhere platform can securely automate even those difficult-to-automate business applications which download the Java runtime environment (jre) during automation execution. Whenever these applications are started, an Automation Anywhere agent gets associated with Java executable noninvasive and automates the business application. After the automation finishes, the Automation Anywhere agent is automatically terminated.

## Automation in nonEnglish languages

Users can securely use German, French, Italian, and Spanish language keyboard characters through the embedded automation commands in Bot Creators. This enables users to write data into these languages. Automation Anywhere customers do not need to depend on less secure third-party libraries for this automation.

# Automation Anywhere Mobile app

The Automation Anywhere Mobile application (app) enables you to monitor and manage your digital workforce through your mobile devices. The app provides real-time data visualizations in operational and business dashboards and bot status information (completions, in-progress, and failures). You can also upload documents for IQ Bot processing, and start and stop bots.

Use the Automation Anywhere Mobile app to monitor and manage bots. The app provides the following features:

### Activity

#### In progress

Start, pause, or stop individual bots.

#### Successful/Failed

View the status of each bot with details of the start date and time, run time, and device name.

### Insights

#### Best Workers

Choose key bots for monitoring by clicking the star icon on the left of these bots.

#### Business dashboards

View data and charts of the business aspects of a bot.

[Bot Insight Business dashboard](#)

*Example: Build a bot that creates a dashboard*

#### Operational dashboards

View data and charts of bots that are deployed on performance on different Bot Runner machines.

[Bot Insight Operation dashboard](#)

### IQ Bot

Upload documents to the Control Room using a mobile device. Capture an image of an invoice, purchase order, utility bill, bank statement, auto insurance claim, or health insurance claim.

## Mobile application FAQs

Use this topic for answers to common questions about the Automation Anywhere Mobile application.

<b>What mobile platforms and versions are supported?</b>	Apple iOS 10.0 or later Android 8.1 or later
<b>How much space does the mobile app take?</b>	The application is about 30 MB.
<b>What version of Automation Anywhere Control Room is required?</b>	The mobile app is compatible with Automation 360.13 and higher versions.
<b>How do I enable the Return on Investment mobile dashboard?</b>	Enable Bot Insight and customize the Center of Excellence dashboard.
<b>Is the communication between the Automation Anywhere Control Room and the Mobile app secure?</b>	Yes, the communication between Automation Anywhere Control Room and the Mobile application is TLS-encrypted.

## Connecting manually to an Control Room

Connect to a Control Room from the Automation Anywhere Mobile application with a self-signed certificate.

The Automation Anywhere Control Room URL might not be published externally (publicly). Mobile application users must either connect to the same Wi-Fi as their organization, or use a VPN to ensure IP accessibility.

---

**Note:** Ensure that you enter the entire URL and port for the Control Room, for example, `http://10.20.30.123:8080`.

---

Follow these steps to manually install a self-signed certificate on the mobile device:

1. Download and install the \*.cer file.  
Find the file through Safari for iOS and Chrome for Android.
2. When prompted, opt to manually Trust the installed certificate profile.  
For *iOS*  
For *Android*

## General Data Protection Regulation guidelines

The General Data Protection Regulation (GDPR) is one of the strictest compliance frameworks for maintaining privacy of personal data. The GDPR defines personal data as any data that can be used to identify a natural person (Data Subject).

For the most current description of Automation Anywhere GDPR compliance statement, see [Master License Agreement](#) and [Cloud Security and Compliance with Data Privacy](#).

# Install and update Automation 360

Automation 360 provides a web-based, cloud-native RPA platform for users of all types. Review the tasks involved in setting up Automation 360.

**Legal disclaimer:** The information provided in this workflow might vary depending on which offering you use. Administrator steps might not be applicable to Cloud or Community Edition.

1. Choose your Automation 360 deployment model.

*Deployment models*

2. Verify the system prerequisites based on your deployment model:

- **Cloud:** *Automation 360 Cloud prerequisites*
- **On-Premises:** *Automation 360 On-Premises prerequisites*
- **Community Edition:** *Get started with Community Edition*

3. **Administrators:** Set up bot users.

Bot users, skip this step and proceed to Step 4.

- a. Receive your administrator credentials.

- **Cloud administrators:** Receive your login credentials with administrator privileges and your Automation 360 dedicated URL from Automation Anywhere.
- **On-Premises administrators:** Receive your licensing information from Automation Anywhere and install Automation 360.

The installation user is assigned administrator privileges.

Installation type	Go here
Windows	<i>Installing Control Room On-Premises</i>
Linux	<i>Installing Control Room on Linux</i>
Amazon Web Services	<i>Installing Control Room on Amazon Web Services</i>
Microsoft Azure	<i>Installing Control Room on Microsoft Azure</i>

Installation type	Go here
Google Cloud Platform	<a href="#">Installing Control Room on Google Cloud Platform</a>

- b. Log in to a supported device, open a supported web browser, and log in to your Control Room using the dedicated URL.
    - [Automation 360 Cloud Bot Runner device requirements](#)
    - [Log in to Automation Anywhere Control Room](#)
  - c. Create your bot users by assigning a role and device license.
    - [Create a user](#)
    - [Create an Active Directory user](#)
  - d. Set up email notifications to Control Room users when events affect them, such as changes to passwords or user information, and account activation or deactivation.
- 4. Bot users:** Perform these steps to get started with Automation 360.
- a. Receive your user login credentials and the Control Room dedicated URL.  
 Credentials are sent to you from your company's Automation Anywhere administrator or from Automation Anywhere.  
 Community Edition users: If you do not have an Automation 360 account, register for a free Community Edition account by visiting [Automation Anywhere Community Edition](#).
  - b. Log in to your Automation 360 account.  
 Log in to a supported device, open a supported web browser, and log in to your Control Room.
    - [Automation 360 Cloud Bot Runner device requirements](#)
    - [Log in to Automation Anywhere Control Room](#)
  - c. [Install Bot agent and register device](#).
- 
- Note:** The Bot agent is installed only on devices running supported Windows operating systems. See [Automation 360 Cloud Bot Runner device requirements](#). You can create bots using the Bot editor in the Control Room, but to run the bots you must install the Bot agent on your device.
- 
- d. Start creating bots:
    - [Create your first bot](#)
    - [Build a Go be Great bot](#)

---

**Update Enterprise A2019:** See [Update to latest Automation 360 version](#).

Cloud and the Community Edition are updated automatically.

---

### Related tasks

[Log in to Automation Anywhere Control Room](#)

To log in to Automation 360, open the Control Room URL in your browser, enter your credentials in the login screen, and click **Log in**.

### [Get started with Community Edition](#)

Use these tasks to register for, and start creating and using bots with Automation Anywhere Community Edition A2019.

#### **Related reference**

##### [Automation 360 Cloud Bot Runner device requirements](#)

Review the machine hardware specifications, operating system versions, and browser types supported by Automation 360 Cloud for creating and running bots on a device. The same requirements are also valid for Automation 360 Community Edition.

##### [Browser requirements](#)

Review the browser requirements to access the Control Room.

## Get started with Automation 360 Cloud

Use these tasks to start creating and using bots with Automation 360 Cloud.

1. Complete the prerequisites for Cloud.

#### *[Automation 360 Cloud prerequisites](#)*

Use the checklist to determine whether your device fulfills the requirements for registering with Automation 360 Cloud.

2. Receive your Control Room URL and login credentials. The URL points to your Automation 360 instance.

If you are your company's principal administrator and ordered cloud-deployed Automation 360, you receive an email from Automation Anywhere with your URL and credentials.

3. *[Log in to Automation Anywhere Control Room](#)*.

To log in to Automation 360, open the Control Room URL in your browser, enter your credentials in the login screen, and click **Log in**.

4. Install Bot agent, register your device, and set user device credentials.

#### *[Install Bot agent and register device](#) | [Set user device credentials](#)*

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

To enable a device for running bots, set the local device credentials.

If you are using an operating system other than Windows, you will not be able to install the Bot agent at this time. See *[system requirements](#)*. However, you can still build bots using the *[Bot editor](#)*.

5. *[Create your first bot](#)*.

Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

6. *[Run your first bot](#)*.

Run a bot from the same device that you used to create the bot.

## Video resources

- Introduction to Automation 360
- Installing the Bot agent in Automation 360:
- Building your first bot:
- Running your first bot in the Community Edition:

## Related information

[Cloud RPA](#)

## Automation 360 Cloud prerequisites

Use the checklist to determine whether your device fulfills the requirements for registering with Automation 360 Cloud.

- Verify the device software and hardware requirements.  
*Automation 360 Cloud Bot Runner device requirements*
- Access the Control Room URL from your browser.  
*Log in to Automation Anywhere Control Room*
- Add the Automation Anywhere Domain Name System (DNS) to the safe recipients or allowed list to ensure secure access to Automation 360 cloud services.  
*Add Automation 360 Cloud DNS to trusted list*
- Add Automation Anywhere to the Windows firewall exception list.  
*Ports, protocols, and firewall requirements*
- Add devices to the allowed list within the corporate network for granular security.  
*Network access*
- Add or update the authenticating proxy credentials to connect your device.  
*Connect Bot agent to a device with a proxy | Connect Bot agent to a device with a proxy using a script*
- Set up SAML authentication identity provider if you are using single sign-on (SSO).  
*Set up SAML authentication*
- Configure your network firewall to add the outbound NAT Gateway IP addresses to the allowed list.  
*NAT IP addresses for Git integration*

## Automation 360 Cloud Bot Runner device requirements

Review the machine hardware specifications, operating system versions, and browser types supported by Automation 360 Cloud for creating and running bots on a device. The same requirements are also valid for Automation 360 Community Edition.

- *Hardware requirements for registered devices*
- *Platform compatibility for registered devices*
- *Supported operating systems for registered devices*
- *Supported browsers for registered devices*

## Hardware requirements for registered devices

You communicate with the Control Room, through a registered local machine (device). Bot Creators and Bot Runners use the registered devices to create and run bots. Part of registering a device with Automation 360 is installing a Bot agent.

**Note:** You cannot install a Bot agent on a device with an existing 10.x or 11.x Enterprise client.

The Bot agent can be installed on devices that meet the following hardware requirements.

Device	Processor	RAM	Storage (free disk space)	Network
Machine	Intel Core i3 2.6 GHz with 4 multi-cores or higher 64-bit	<ul style="list-style-type: none"> <li>4 GB (Minimum)</li> <li>8 GB (Recommended)</li> </ul>	32 GB Add 100 through 150 KB per Automation Anywhere script Add 40 through 50 GB per long-term project	<ul style="list-style-type: none"> <li>5Mbps (Minimum)</li> <li>20Mbps or higher (Recommended)</li> </ul>
Additional users on a multi-user device	2 CPU per additional user	4 GB per additional user	No additional storage required	No additional network needed

### Additional RAM requirements for the registered devices

Add additional RAM to account for applications and services running on the registered devices, for example:

- Microsoft Office applications (example: Excel)
- Browsers (example: Google Chrome)
- Enterprise applications (example: CRM, Oracle EBS, and SAP)
- VDI infrastructure applications
- Anti-virus software

### Additional disk space on registered devices

- Automation 360 scripts average approximately 100-150 KB. Additional free disk space is required to develop automation projects because temporary files such as screenshots, server logs, and audit files are created during the execution of the automation scripts.
- Free space required increases with the project size. Recommendation: Have at least 40-50 GB of free disk space for each long-term project.
- Increase storage space configuration after installation, as needed, depending on product usage. For example, depending upon the complexity of your bot, generating log files and logic creation require additional disk space later.

## Platform compatibility for registered devices

A device used to connect to the Control Room and perform bot tasks must meet the platform requirements.

---

**Note:** Platform requirements are different for Control Room and Bot agent.

---

<b>Registered devices</b>	Physical machines that you want to use for creating bots or deploying bots and running any of the supported operating systems.
<b>Terminal servers</b>	Using remote desktop (RDP) running any of the supported operating systems is supported is supported on Automation 360 Version A2019.11 or later. .
<b>Virtual machines</b>	Bot agent is supported on all VMs where the supported Windows OS has been hosted on Version A2019.09 or later. For example, Virtual Desktop Infrastructure (VDI) are supported on Amazon Web Services, Microsoft Azure, Google Cloud Platform, VMware virtual machines, and Oracle Virtual Box.

## Supported operating systems for registered devices

A device used to run the Bot agent, connect to the Control Room, and perform bot tasks as a Bot Creator and Bot Runner must meet the operating system requirements.

---

**Note:**

- Only 64-bit operating system version supported.
- Bot Creator tasks are supported with all the listed operating systems.
- You cannot register a device that is running on a Linux system. The Bot agent cannot be installed on Linux systems. However, you can use a registered device running on a Windows system to access a Control Room that is installed on a Linux system.

---

Windows version	Windows edition	Attended Bot Runner	Unattended Bot Runner	Bot Creator
Windows Server 2019	Datacenter and Standard	Supported	Supported <sup>1</sup>	Supported
Windows Server 2016	Datacenter and Standard	Supported	Supported <sup>1</sup>	Supported
Windows Server 2012	Datacenter and Standard	Supported	Supported <sup>1</sup>	Supported
Windows 10	Professional and Enterprise	Supported	Supported <sup>1</sup>	Supported
Windows 8 <sup>2</sup>	Professional and Enterprise	Supported	Supported	Supported

Windows version	Windows edition	Attended Bot Runner	Unattended Bot Runner	Bot Creator
Windows 7 <sup>2</sup>	Professional and Enterprise	Supported	Supported	Supported

### (1) Auto-login

- Auto-login is only supported on 64-bit systems.
- If the Auto-login fails, configure the **Local Security Policy** settings. For example, in Windows, select **Security Settings > Local Policies > Security Options**. Enable the **Interactive logon: Do not require CTRL +ALT+DEL** option.

### (2) Supported OS

Windows 8 (64-bit) supported on Enterprise A2019 Builds 1598 and 1610 or earlier.

Windows 7 (64-bit) supported on Enterprise A2019.12 or later.

## Supported browsers for registered devices

The user interface for Automation 360 is accessed through a browser. Log in to your device, and then log in to Control Room through a browser.

Browser	Browser version
Google Chrome	57 or later
Microsoft Internet Explorer	11

## Add Automation 360 Cloud DNS to trusted list

To ensure secure access to Automation 360 cloud services, add specific Automation Anywhere Domain Name System (DNS) to the safe recipients or trusted list.

Automation 360 cloud service hosting uses dynamic IP addresses and therefore we recommend that you add to the safe recipients list the complete DNS instead of an IP address for the Automation Anywhere cloud services.

Service	DNS	Port
Automation Anywhere	www.automationanywhere.com	TCP 443 (HTTPS)
Automation Anywhere Cloud customer tenant	crdomainname-X.my.automationanywhere.digital	TCP 443 (HTTPS)
Includes Automation Anywhere Control Room and IQ Bot	<b>Note:</b> crdomainname-X refers to your specific tenant name.	
Automation Anywhere Bot agent download link	s3*.amazonaws.com/ botrunnermanager/*	TCP 443 (HTTPS)

Service	DNS	Port
Automation Anywhere community (A-People)	apeople.automationanywhere.com	TCP 443 (HTTPS)
Automation Anywhere documentation	docs.automationanywhere.com	TCP 443 (HTTPS)
Bot Store	botstore.automationanywhere.com	TCP 443 (HTTPS)
Content delivery network (CDN) Enables your platform to perform faster as it geographically distributes common static content for cloud tenants.	aai-artifacts.my.automationanywhere.digital	TCP 443 (HTTPS)
Telemetry Allows performance and usage information to be gathered anonymously in order to improve product quality.	<ul style="list-style-type: none"> <li>cdn.whatfix.com</li> <li>cdn.heapanalytics.com</li> <li>heapanalytics.com</li> </ul>	TCP 443 (HTTPS)
Automation Anywhere Google Chrome extension Enables you to automate using the Google Chrome browser.	https://chrome.google.com/webstore/detail/automation-360/kammdlphdfejlopponbapgpbgakimokm	TCP 443 (HTTPS)
Automation Anywhere Microsoft Edge extension Enables you to automate using the Microsoft Edge browser.	https://microsoftedge.microsoft.com/addons/detail/automation-360/dbmodiepejcgijlbmeebedkmegndokbk	TCP 443 (HTTPS)
Automation Anywhere Mozilla Firefox extension Enables you to automate using Mozilla Firefox browser.	https://addons.mozilla.org/en-US/firefox/addon/automation-360	TCP 443 (HTTPS)

**Related reference**[Ports, protocols, and firewall requirements](#)

View the default and configurable firewall, port, and protocol requirements for Automation Anywhere deployment.

## Installing Control Room On-Premises

Review the installation core tasks and topics for installing the Automation 360 Control Room in a data center on an On-Premises server or a cloud service provider server instance.

The Control Room provides centralized management for a digital workforce and an interface for Bot Insight. It is deployed on a server in a data center. Before you begin, download the appropriate installer for your operating system and version from [A-People Downloads page \(Login required\)](#).

---

**Linux users:** See *Installing Control Room on Linux*.

---

**Note:** Linux is not supported for Cloud-enabled On-Premises installations.

---

## Control Room installation core tasks

### Step 1: Pre-installation

*Automation 360 On-Premises prerequisites*

Determine whether the system has the required hardware and software to install Control Room for On-Premises.

### Step 2: Installation

The Control Room installer allows you to select installation modes (Express or Custom), and during the installation process, it also installs missing software dependencies.

Use Custom mode to install on a cloud-based platform such as Amazon Web Services.

*Installing Control Room using Express mode*

Log in to the servers as an Administrator and install Automation Anywhere Control Room in Express Mode using the default settings.

*Installing Control Room using Custom mode*

Log in to the server as an administrator and install Automation Anywhere Control Room in Custom mode to select installation and configuration options, including installing non-default requirements. Select this mode for a data center deployment.

*Installing Control Room on Microsoft Windows Server using scripts*

Silent Control Room installation, also known as unattended installation, uses a customized script for a full setup or the command line for a hot fix patch. Silent install runs the entire installation process in the background without requiring user

		interaction or displaying messages.
<b>Step 3: Post-installation</b>	<i>Configuring post-installation settings</i>	The options for launching the Control Room for the first time and the authentication method depend on the installation mode and deployment type.
	<i>Verifying Automation Anywhere services</i>	Automation Anywhere specific services are installed on the Control Room server.
<b>Step 4: Validation</b>	<i>Configure Control Room authentication options</i>	The options for launching the Control Room for the first time and the authentication method depend on the installation mode and deployment type.

## Automation 360 On-Premises prerequisites

Determine whether the system has the required hardware and software to install Control Room for Automation 360 On-Premises.

### Hardware requirements

#### *Control Room server requirements*

The Control Room is deployed on servers in data centers. The minimum Automation Anywhere hardware requirements include: server type, machine type, processor, RAM, disk storage, and network requirements.

#### *Operating system, environment, and platform supported for Control Room*

Automation 360 can be hosted on AWS, Microsoft Azure, Google Cloud Platform, IBM, and any public, private, or hybrid cloud service that meets the Control Room and Bot agent hardware and software requirements.

#### *Bot agent compatibility*

Bot agent is the Automation 360 plug-in that enables you to create and run bots. The agent is installed on devices used to access the Control Room. Installing the Bot agent is part of registering a device.

#### *Credential requirements*

Login credentials are required at different stages of Automation Anywhere deployment and use. Credentials are required for installation and data

center servers, access to Automation Anywhere components, and to run tools in bots.

Review the supported cloud platforms for various Automation 360 features.

### *Supported cloud platforms*

## Data center requirements

### *Database requirements*

*Working with SQL Servers* Configure Microsoft SQL Servers before setting up the Control Room database.

*Working with Azure SQL PaaS* Using PaaS SQL database with Azure requires configuration from the Azure instance.

### *Load balancer requirements*

View the load balancer requirements for Automation Anywhere installation. This includes load balancer minimum requirements, and both TCP and HTTPS layer load balancing requirements.

### *Ports, protocols, and firewall requirements*

View the default and configurable firewall, port, and protocol requirements for Automation Anywhere deployment.

### *Browser requirements*

The user interface for Automation 360 (On-Premises or Cloud deployed) and for Community Edition is accessible through a browser.

### *Automation 360 deployment models*

*High availability deployment* The high availability (HA) deployment model provides failure tolerance for the Control Room servers, services, and databases using a distributed load balancer.

*Disaster recovery deployment* The disaster recovery (DR) deployment model uses high availability (HA) clusters distributed across separate geographic areas.

*Single-node deployment* A single-node deployment hosts the Control Room only on one server or machine.

## Additional requirements

*Configure application Transport Layer Security*

Use the **Transport Layer Security (TLS) configuration** wizard page from the Automation 360 installer to generate a self-signed certificate or import a security certificate to set up a highly secure Control Room instance.

See also this article on the Automation Anywhere support site: [Automation 360 On-Premises prerequisites \(A-People login required\)](#).

### Related concepts

[Installing Control Room on Microsoft Azure](#)

Installing Control Room on Microsoft Azure begins in the Azure environment and ends with configurations in the Control Room.

[Installing Control Room on Amazon Web Services](#)

Login to an Amazon Web Services (AWS) server instance as Administrator. Then download and start the Control Room installer and select **Custom** mode.

[Installing Control Room using Custom mode](#)

Log in to the server as an administrator and install Automation Anywhere Control Room in Custom mode to select installation and configuration options, including installing non-default requirements. Select this mode for a data center deployment.

### Related tasks

[Installing Control Room using Express mode](#)

[Installing Control Room on Microsoft Windows Server using scripts](#)

Silent Control Room installation, also known as unattended installation, uses a customized script for a full setup or the command line for a hot fix patch. Silent install runs the entire installation process in the background without requiring user interaction or displaying messages.

## Capacity and performance planning

To plan your deployment capacity and performance for Control Room On-Premises, understand the requirements, limits, and defaults that determine the number of simultaneous bots, user sessions, and processing rates.

The following topics provide information to help you calculate a deployment scenario that meets your requirements.

*Bot deployment and concurrent operations*

To plan your deployment capacity and performance for Control Room On-Premises, understand the requirements, limits, and defaults that determine the number of simultaneous bots, user sessions, and processing rates.

*Bot Quality of Service priorities*

Use of the concept Quality of Service (QoS) applies to availability of the Control Room.

*Bot agent status processing*

A method called rate limiting is applied to the rate at which status message from a Bot agent is processed.

## Bot deployment and concurrent operations

List of maximum concurrent operations and estimated deployment times.

### Overview

The entity count in the following list provides information about the maximum number of entities that the Control Room can support. Deploying additional Control Room or machine resources does not affect the entity count.

Control Room supports up to:

- 1000 simultaneous bot deployments and executions on Bot Runner sessions.
- 700 simultaneous bot deployments and executions on Bot Creator sessions.

Entity Type	Count
Users	10,000
Roles	5000
Schedules	1500
Audit entries	10,000,000
Lockers	100
Credentials	5000
Repository files	25,000
Repository folders	9000
Queues	10
Device pools	10
Work Items	1,000,000

### Concurrent deployment operations

The time taken for deployment depends on the network quality. An increase in the number of Control Room and the network connectivity speed improves the throughput and enables faster deployment.

Control Room supports up-to 1000 simultaneous bot deployments and executions across the Control Room cluster.

Control Room edition and configuration	Number of Run as users	Deployment time
One instance of On-Premises	Maximum 1000	3 minutes
Three instances of On-Premises with High Availability (HA) configuration	Maximum 1000	3 minutes

## Bot concurrent schedules

Scheduling considerations when running bots repeatedly.

When configuring bots to run repeatedly on a schedule it is important to make sure that the time between runs does not drop below the total time for deployment and execution of the bot. Otherwise, sequential executions of the bot might overlap leading to unexpected behavior.

For example if it takes 20 seconds to run a bot, do not schedule the bot to run every 15 seconds. The previous run cannot complete before the next run begins.

With the reference specification, it is possible to successfully configure concurrent schedules.

Activity	Schedule data
Concurrent schedules	100
<b>Run as</b> user per schedule	10
Total concurrent bots	1000
Deployment time	3 minutes

## Bot Quality of Service priorities

Use of the concept Quality of Service (QoS) applies to availability of the Control Room.

To maintain high operational availability the Control Room is designed around the concept of Quality of Service (QoS).

Each incoming request is examined to identify, and requests are prioritized based on:

- Whether the request originated from a device or not
- What high-level Control Room function it is for (repository, configuration, etc.)

## Request originator type

High priority is assigned to API requests that do not originate from a Bot agent, such as a user accessing the Control Room through a web browser. This ensures administrative functions, such as viewing the status of a device or disabling a bot, run even when the Control Room is fully utilized.

## Repository requests from devices

By default, the number of device requests processed in parallel by the Control Room repository are limited. Any requests that are received above the limit are queued first in, first out with very little overhead. This enables control of the CPU and operating system thread consumption for repository operations.

## Other bot deployment and execution requests from devices

Bot agent make infrequent requests to other services on the Control Room related to the deployment and execution process. The completion time for individual requests of this type are not influenced by network capacity.

## Security token refresh from devices

Security token refresh requests from devices are prioritized ahead of other device requests.

## Bot agent status processing

A method called rate limiting is applied to the rate at which status message from a Bot agent is processed.

How quickly status updates from a Bot agent is processed is rate limited. The rate limit is based on the Bot agent Control Room node. This prevents overload when concurrently executing a large number of bots.

- The rate limit is adjusted dynamically based on the number of unprocessed status update messages.
- Critical status update messages that indicate start, stop or error are never rate-limited.
- If reactive rate-limiting is activated, the progress reported on the **Activity** page is updated at a lower frequency than normal.

## Control Room server requirements

The Control Room is deployed on servers in data centers. The minimum Automation Anywhere hardware requirements include: server type, machine type, processor, RAM, disk storage, and network requirements.

**Note:** Automation Anywhere does not provide any monitoring functions for repository such disk space usage, memory or other alert mechanisms related to repository. There are commercial tools available from other third-party independent software vendors (ISV) who provide such tools.

The installation wizard requires the following:

- **IP addresses:** Identify all the nodes (servers) IP addresses in the data center cluster before installation. You provide these IP addresses during Control Room installation.
- **Access hardware:** To enable viewing the Automation Anywhere interface, provide:
  - keyboard
  - mouse or other pointing device
  - monitor with 1366 x 768 or higher resolution

**Note:** For IQ Bot server requirements, see [IQ Bot hardware and software requirements](#).

Control Room must be installed on a 64 bit, server level machine and there can only be one instance of it on the machine. All previous Control Room versions must first be removed from the server machine before you begin the installation.

The following server requirements for Windows and Linux.

Component server	Processor	RAM	Storage (free disk space)	Network
Control Room Servers	8 core Intel Xeon Processor	16 GB	500 GB	1 GbE <ul style="list-style-type: none"> <li>• IPv4</li> <li>• IPv6</li> </ul>

**Tip:** We recommend you to configure the Control Room network bandwidth to above 1 GbE for all inter-cluster communication between:

- Control Room and database
- All Control Room nodes
- Control Room and Elasticsearch nodes
- Control Room and storage systems
- Database nodes for high availability (HA) and disaster recovery (DR) configuration

---

## Database requirements

View the list of supported databases, database server type, version, hardware, and operating system requirements, and database backup and recovery requirements.

Automation Anywhere installation creates a database to store bot data and metadata for the analytics dashboards.

---

**Note:** Automation Anywhere does not provide any monitoring functions for database activities, such as disk space usage, memory, or other alert mechanisms related to databases. There are commercial tools available from database vendors and other third-party independent software vendors (ISV) who provide such tools.

---

For latest updates, see [Microsoft SQL Server Hardware and Software requirements](#).

## Database server hardware requirements

Component server	Processor	RAM	Storage	Network
Microsoft SQL Server database	4-core Intel Xeon Processor	8 GB	500 GB	1 GbE

---

**Note:** If you are hosting the Control Room databases along with other application databases, ensure that the hardware resources are increased proportionately.

## Database server version and operating system requirements

Microsoft SQL Server database is required.

Database type	Database version	Database edition	Installed OS	Supported platforms	Configuration requirement
Microsoft SQL Server database	2019 2017 2016 2014	Enterprise Express Standard Developer (for 2019)	Windows Server 2008 R2 Standard or later Linux CentOS 7.7, 7.9, and 8.3 Red Hat Enterprise Linux 7.7, 7.9, and 8.3	Amazon Web Services Relational Database Service (RDS)	Installed and configured.  Only option for Express installations.  Enable protocols for Named Pipes and TCP/IP.

- All database versions support all certified operating systems.
- We have certified Amazon RDS for SQL Server and Azure SQL single database for PaaS deployment.
- We recommend Enterprise or Standard editions of Microsoft SQL Server database for production use and to ensure business continuity with HA and DR deployments. You can configure the Express edition of Microsoft SQL Server for Automation 360 testing and proof of concept (POC) purposes.

### Required database information for Automation Anywhere installation

When you install Automation Anywhere, you are prompted to provide information specific to the database type you are using. The following table summarizes the required information.

Microsoft SQL Server database	
Required information	Description
Database (SQL Server) authentication  <b>Note:</b> Linux installations use this authentication method	Provide credentials for a Microsoft SQL Server user who has permission to connect to the database.  Use only supported characters for the authentication user name and password. See <a href="#">Supported special characters</a> . Do not use semicolons ( ; ) in the database password.  <b>Linux example:</b> SQL Database server Login ID: sa SQL Database password: Automation123 sa user authentication is mandatory.
Database names	Database names cannot be blank, have spaces, or include a percent ( % ). Restrict the names to alphanumeric, period ( . ), hyphen ( - ), and underscore ( _ ).  Default name: Automation360-Database

Microsoft SQL Server database	
Required information	Description
Database port	Default: 1433 Connection to this port is mandatory.
Secure connection (optional) and certificate	Provide a CA certificate. Ensure the certificate host name and database connection are the same.
Service credentials	Provide Local system account user or Domain user account. This becomes the assigned user for the created databases and tables. The preferred method is to use the Domain user account.  Provide the user with system administrator or database creator permission to create databases during installation.
Windows authentication	User-provided (or default) used to connect to the Microsoft SQL Server, test database exists, create database if not present, and set <code>db_owner</code> to the service account user.

Before installing Automation 360, ensure that you have configured additional firewall settings, verified the connection to the default port and an SQL query with SA user works as expected.

### Related concepts

[Installing Control Room on Amazon Web Services](#)

Login to an Amazon Web Services (AWS) server instance as Administrator. Then download and start the Control Room installer and select **Custom** mode.

[Installing Control Room on Microsoft Azure](#)

Installing Control Room on Microsoft Azure begins in the Azure environment and ends with configurations in the Control Room.

### Related tasks

[Installing Control Room on Linux](#)

You start installing the Automation Anywhere Control Room in the Linux environment and complete the installation in the Control Room.

[Configure default database port](#)

Configure and enable the TCP/IP in the SQL database server to use the default port 1433 when you install the Control Room.

### Related reference

[Ports, protocols, and firewall requirements](#)

View the default and configurable firewall, port, and protocol requirements for Automation Anywhere deployment.

## Working with SQL Servers

Configure Microsoft SQL Servers before setting up the Control Room database.

### Configuring SQL Server Settings

*SQL Server* settings can be configured in the SQL Server Configuration Manager.

1. Enable protocols for Named Pipes and TCP/IP in **SQL Server Network Configuration > Protocols for MSSQLSERVER**.
2. Double-click TCP/IP to open the properties window.
3. Input the port number for `IPAll` in the IP Addresses tab of the TCP/IP Properties window.
4. Click **OK**.
5. Restart the MSSQLSERVICE for the updates to take effect.

## Database and Services Matrix

See [Database requirements](#) for a list of supported Microsoft SQL Server versions.

Service Credentials	Windows Authentication	SQL Authentication
Local System Account	<ul style="list-style-type: none"> <li>• Current logged in user account is used to create:               <ul style="list-style-type: none"> <li>• <i>Database</i></li> <li>• Tables</li> </ul> </li> <li>• Installer gives <code>db_owner</code> permission to NT AUTHORITY\SYSTEM account.</li> </ul>	SQL User account is used to create: <ul style="list-style-type: none"> <li>• Databases</li> <li>• Tables</li> </ul>
Domain User Account	<ul style="list-style-type: none"> <li>• Current logged in user account is used to create database.</li> <li>• Domain user account is used to create tables.</li> <li>• Installer gives <code>db_owner</code> permission to domain user account.</li> </ul>	SQL User account is used to create: <ul style="list-style-type: none"> <li>• Databases</li> <li>• Tables</li> </ul>
Service User Account		For Microsoft Azure installations, the service account user needs to have read/write access to the remote Microsoft Azure repository share path.

**Related reference**[Ports, protocols, and firewall requirements](#)

View the default and configurable firewall, port, and protocol requirements for Automation Anywhere deployment.

## Working with Azure SQL PaaS

Using PaaS SQL database with Azure requires configuration from the Azure instance.

Configure the Azure instance before you install Automation 360.

1. Log in to your Azure account.
2. Navigate to the **Azure SQL** option.
3. Create a database based on your custom requirements.
4. Enable the firewall option.
5. Add the IP address to safe recipients list for accessing the database.

Install Automation 360 and point the database server to this instance of the SQL database. See [Customize Control Room installation on Microsoft Azure](#).

## Operating system, environment, and platform supported for Control Room

Automation 360 can be hosted on AWS, Microsoft Azure, Google Cloud Platform, IBM, and any public, private, or hybrid cloud service that meets the Control Room and Bot agent hardware and software requirements.

Automation 360 is currently certified on AWS and Microsoft Azure. For Bot agent operating system and platform compatibility, see the Bot agent compatibility matrices in [Bot agent compatibility](#).

Automation 360 supports 64-bit version of the Microsoft operating system.

---

**Recommendation:** Enable Desktop Experience when using the server or client operating system.

---

The following sections list the environment and deployment types with the release or build number applicable to each supported operating system:

- [Microsoft Windows Server 2012 and 2012 R2 Datacenter](#)
- [Microsoft Windows Server 2016 Standard and Datacenter](#)
- [Microsoft Windows Server 2019 Standard and Datacenter](#)
- [Linux CentOS](#)
- [Red Hat Enterprise Linux](#)

### Microsoft Windows Server 2012 and 2012 R2 Datacenter

Environment	Automation 360 build (version)
<ul style="list-style-type: none"> <li>• Amazon Web Services Elastic Compute Cloud (EC2)</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premises: Build 4105 (A2019.12) or later</li> <li>• Cloud: Build 4111 (A2019.12) or later</li> </ul>
<ul style="list-style-type: none"> <li>• Microsoft Azure VM</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premises: Build 4105 (A2019.12) or later</li> <li>• Cloud: Build 4111 (A2019.12) or later</li> </ul>

Environment	Automation 360 build (version)
<ul style="list-style-type: none"> <li>Google Compute Engine</li> </ul>	<ul style="list-style-type: none"> <li>On-Premises: Build 7103 (A2019.17) or later</li> </ul>

## Microsoft Windows Server 2016 Standard and Datacenter

Microsoft Windows Server 2016 is the minimum recommended operating system.

Environment	Deployment type with release and build
<ul style="list-style-type: none"> <li>Microsoft Azure VM</li> </ul>	<ul style="list-style-type: none"> <li>On-Premises: Build 2079 or later</li> <li>Cloud: Build 2079 or later</li> </ul>
<ul style="list-style-type: none"> <li>Google Compute Engine</li> </ul>	<ul style="list-style-type: none"> <li>On-Premises: Build 7103 (A2019.17) or later</li> </ul>

## Microsoft Windows Server 2019 Standard and Datacenter

Environment	Deployment type with release and build
<ul style="list-style-type: none"> <li>Amazon Web Services Elastic Compute Cloud (EC2)</li> </ul>	<ul style="list-style-type: none"> <li>On-Premises: Build 1089 or later</li> <li>Cloud: Build 1082 or later</li> </ul>
<ul style="list-style-type: none"> <li>Google Compute Engine</li> </ul>	<ul style="list-style-type: none"> <li>On-Premises: Build 7103 (A2019.17) or later</li> </ul>
<ul style="list-style-type: none"> <li>Microsoft Azure VM</li> </ul>	<ul style="list-style-type: none"> <li>On-Premises: Build 2079 or later</li> <li>Cloud: Build 2079 or later</li> </ul>

## Linux CentOS

Environment	Deployment type with release and build
<ul style="list-style-type: none"> <li>Amazon Web Services Elastic Compute Cloud (EC2)</li> </ul>	<p>For Linux CentOS 7.7:</p> <ul style="list-style-type: none"> <li>On-Premises: From Build 2545 or later</li> <li>Cloud: From Build 2545 or later</li> </ul> <p>For Linux CentOS 7.9 and 8.3:</p> <ul style="list-style-type: none"> <li>On-Premises: From Build 9642 or later</li> </ul>

## Red Hat Enterprise Linux

Environment	Deployment type with release and build
<ul style="list-style-type: none"> <li>Amazon Web Services Elastic Compute Cloud (EC2)</li> </ul>	For Red Hat Enterprise Linux 7.7: <ul style="list-style-type: none"> <li>On-Premises: From Build 2545 or later</li> <li>Cloud: From Build 2545 or later</li> </ul> For Red Hat Enterprise Linux 7.9 and 8.3: <ul style="list-style-type: none"> <li>On-Premises: From Build 9642 or later</li> </ul>

### Related reference

#### [Bot agent compatibility](#)

Before you install the Bot agent, ensure it is compatible with the hardware and software in your environment.

#### [Control Room server requirements](#)

The Control Room is deployed on servers in data centers. The minimum Automation Anywhere hardware requirements include: server type, machine type, processor, RAM, disk storage, and network requirements.

## Supported cloud platforms

Review the supported cloud platforms for various Automation 360 features.

Automation 360 feature	Google Cloud Platform	AWS	Microsoft Azure
Control Room	Yes	Yes	Yes
Bot agent	Yes	Yes	Yes
Bot Insight	Yes	Yes	Yes
IQ Bot	Yes	Yes	Yes
Discovery Bot	Yes	Yes	Yes
AI Sense Recorder	Yes	Yes	Yes

## Credential requirements

Login credentials are required at different stages of Automation 360 deployment and use. Credentials are required for installation and data center servers, access to Automation 360 components, and to run tools in bots.

Access point	Task	Type
Data center servers	Install Control Room.	User on the hosting server: <ul style="list-style-type: none"> <li>Windows - system administrator</li> <li>Linux - superuser sudo, root</li> </ul>

Access point	Task	Type
Data center servers	Manage (run, stop, restart) Control Room.	Administrator and <b>Logon as Service</b> permission for Windows services and the Domain or the VM technical user account.
Bot agent devices	Install, setup, or update Bot agent.	Administrator permission on the device.
Bot agent devices	Start or stop Bot agent service.	Administrator permission on the device. Write permission on Bot agent device system paths: C:\ProgramData C:\Windows\System32\config\systemprofile C:\Users\<<loggedInUser>\AppData\Local\AutomationAnywhere
Local devices	Register device.	Windows login to open a browser and login into the Control Room and register the local device. Administrator permission not required.
Local devices	Download bots to local device. Run new bots or existing (downloaded) bots.	Windows login. Administrator permission not required.
Automation 360 login	Perform specific tasks, such as create a bot or run a bot.	License and role based permissions. Bot Creator and Bot Runner users <b>do not</b> require administrator privileges.
bot task	Used by bots to perform bot tasks.	Credential Vault stores securely created credentials. Read permission on bot machine system path: C:\Windows\System32\config\systemprofile \AppData\Local\AutomationAnywhere
Automation Anywhere Service	Run all Windows services created by Automation 360.	Local system account user or Domain user account.

Access point	Task	Type
Remote Desktop Protocol (RDP) to a Windows machine	Run bots on Bot Creators and unattended Bot Runners if RDP connection exists for the deployed user.	Administrator permission is not required. RDP access for the bot is not required. view the Control Room <b>Activity</b> page.
Remote Desktop Protocol (RDP) to a server OS or a hosted VM	Run bots on Bot Creators and unattended Bot Runners if RDP connection exists for the deployed user.	Administrator permission required. RDP access for the bot is required. For confirmation, view the Control Room <b>Activity</b> page.

### Data center server credentials

Data center server credentials for Automation Anywhere hosting servers and integrated product servers are required to deploy Automation 360.

To install and deploy Automation 360 requires that users log in to the hosting servers. These users must have permissions to install and run Automation 360 components on the servers. Permissions levels need to be assigned to the user on selected data center applications and servers.

### Automation 360 login

Log in to Automation 360 requires a username and password. These credentials are linked to the machine you use to access the Automation 360 components. Your credentials are assigned roles that give you permission to perform specific tasks, such as create a bot or run a bot.

### Bot task

As an automation expert, Credential Vault provisions you to securely create and store your credentials. This ensures that your credentials can be used in bots without compromising security with safe deployment of tasks. Any authorized user can create credentials.

### Windows services

The Windows service credentials include a user name and password. The user specified needs to be:

- A member of the local system administrator group.
- Have permission to manage services, including Automation Anywhere services.
- If you use Windows authentication to connect to the SQL database, ensure you grant the `db_owner` permission to the service credential user.

The service credentials are used to create database tables and allow the Control Room processes to access the database and repository.

The service credential choices are:

**Local System Account** The logged-on user performing the installation (default) .

**Domain User Account** A user that is not the local system account user.

Reasons and requirements for using a domain account user include:

- **Use the Windows domain credentials**

Enter credentials valid for running Automation Anywhere services.

- **PowerShell script restrictions**

Specify a user with permissions to launch PowerShell scripts, who is not a Windows domain user, or database table creation can fail.

## Load balancer requirements

View the load balancer requirements for Automation 360 installation. This includes load balancer minimum requirements, and both TCP and HTTPS layer load balancing requirements.

### Load balancer minimum requirements

As a best practice, ensure the load balancer:

- (Required) Supports WebSocket protocol (RFC 6455)
- (Preferred) Uses round-robin host selection and is not configured to use persistent (sticky) sessions.
- (Preferred) Uses the appropriate TLS security layer:
  - TCP (layer 4) load balancing
  - HTTPS (layer 7) load balancing

With a Nginx load balancer, set HTTPS termination at nodes by changing `http://Backend` to `https://Backend`.

- (Preferred) Has idle timeout set to 120 seconds.

The timeout value depends on the process time of various actions in the Control Room such as the time required to check in and check out bots, import bots, and download bot dependencies.

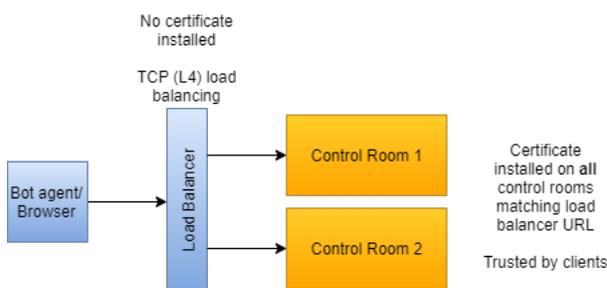
If the idle timeout is less than the Control Room processing time, a browser request can time out. For example, if the configured idle timeout is not sufficient to complete a bot check-in action, you will have to refresh your browser to validate whether the bot check-in action is successful or not.

## Load balancer health check parameters

The load balancer health check parameters depend on various factors such as the type of load balancer used, network latency, and user interface responsiveness within and outside the load balancer.

## TCP (Layer 4) Load Balancing

When TCP is applied at layer 4 with the load balancer, the certificate is installed on every Control Room corresponding to the load balancer URL.



In the image, Control Room components are shown in orange and other components are shown in blue.

### Pros

End-to-end encryption without the possibility of intercept at the load balancer.

Single certificate required.

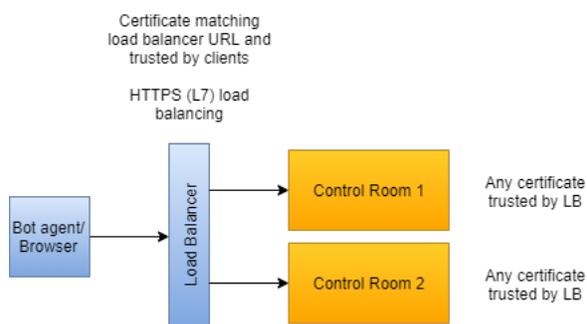
### Cons

If audit logging is required, the load balancer cannot report the requests from clients.

Does not use TLS hardware offloading, even if the load balancer supports it.

## HTTPS (Layer 7) Load balancing

When HTTPS is applied at layer 7 with the load balancer, the certificate corresponding to the load balancer URL is applied through the load balancer. The Control Room trusts the certificates received from the load balancer.

**Pros**

Allows request logging, when supported by the load balancer.

Reduces load from TLS handshake through hardware offloading, when supported by the load balancer.

**Cons**

Certificates must be managed both on the load balancer and on the control room nodes

Possible interception of data at the load balancer hardware level, because TLS session is not end-to-end.

For Automation 360 users on release Build 7560 and later, if SSL offloading is applied at load balancer level for communication between load balancer and application nodes, the `traefik.toml` file in application server needs to be re-configured.

See [SSL offloading for Automation 360 v.18 and later \(A-people login required\)](#)

## Ports, protocols, and firewall requirements

View the default and configurable firewall, port, and protocol requirements for Automation Anywhere deployment.

- Add Automation Anywhere to the Windows Firewall exception list. Follow the steps as directed by Microsoft for your Windows version.
- Configure the firewall rules and add the Control Room URLs to safe recipients list.

Refer to the following tables for lists of required ports and their use.

### Control Room



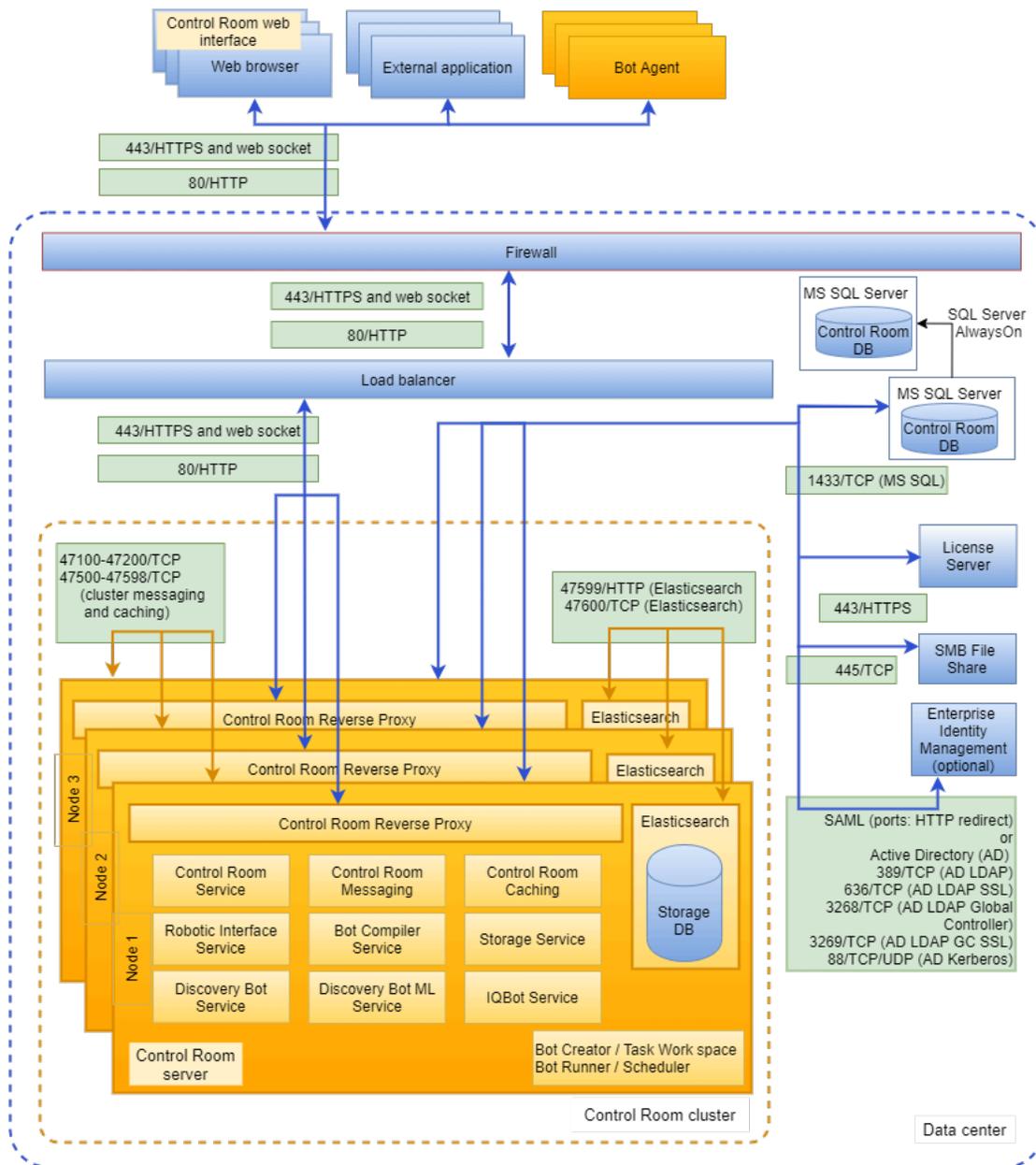
**Warning:** It is critical that communication between the Control Room servers is properly protected. These Control Room servers contain security sensitive information that is not encrypted. Therefore, excluding the Control Room servers, you should block all other network hosts from accessing the listed Automation Anywhere cluster communication ports.

Protocol	Incoming Port	Usage	Clients
HTTP	80	HTTP	Web browsers
HTTPS	443	HTTPS and Web Socket	Web browsers

Protocol	Incoming Port	Usage	Clients
TCP	5672	Cluster Messaging	Control Room Services
TCP	47500 – 47600	Cluster Messaging and Caching	Control Room Services
TCP	47100 – 47200	Cluster Messaging and Caching	Control Room Services
HTTP	47599	Elasticsearch	Control Room Services
TCP	47600	Elasticsearch	Control Room Services

### Data center ports and protocols for Automation 360

Configure each of the data center components that are required for Control Room integration. In the image below, Control Room components are shown in orange and data center components provided by your organization are shown in blue.



Default ports are listed for illustration purposes. Some ports can have alternative port numbers specified during Control Room installation. Some port numbers can be modified after Control Room installation. Active Directory ports are listed as an example of an enterprise identity management.

The configured ports are bidirectional and outbound for Control Room.

All three objects, the web browser, Bot agent, and external applications communicate directly with the Control Room. A user logs into the Control Room through a browser, to do tasks, such as creating users, or bot related tasks, such as creating, deploying, and scheduling bots. Bot agent establishes a connection with the Control Room on registration and keeps it alive in order to receive bot deployments from the Control Room. External applications talk to the Control Room directly through the Control Room APIs to perform tasks such as creating users or running bots.

Data center object	Port default	Protocol default	Notes
Load balancer	<ul style="list-style-type: none"> <li>443</li> <li>80</li> </ul>	HTTP, HTTPS, and web socket	
Firewall	<ul style="list-style-type: none"> <li>443</li> <li>80</li> </ul>	HTTP, HTTPS, and web socket	
Enterprise identity management Example: Active Directory ports	<ul style="list-style-type: none"> <li>389</li> <li>636</li> <li>3268</li> <li>3269</li> <li>88</li> </ul>	<ul style="list-style-type: none"> <li>TCP (LDAP)</li> <li>TCP (LDAP SSL)</li> <li>TCP (LDAP Global controller)</li> <li>TCP (LDAP Global controller SSL)</li> <li>TCP/UDP (Kerberos)</li> </ul>	
Microsoft SMB file share	445	TCP	
Microsoft SQL database server	1433	TCP	Override default at Control Room installation.

### Microsoft Azure supported data center elements

Data center object	Supported version	Configuration
Control Room operating system	<ul style="list-style-type: none"> <li>Microsoft Windows Server 2012 and 2012 R2 Datacenter</li> <li>Microsoft Windows Server 2016 Standard and Datacenter</li> <li>Microsoft Windows Server 2019 Standard and Datacenter</li> </ul>	IaaS
Identity management: Azure <i>Active Directory</i>	Azure Active Directory	<ul style="list-style-type: none"> <li>IDaaS</li> <li>Windows 2016 for IaaS</li> </ul>
<i>SMB File Share</i>	Azure File Share	PaaS
<i>Load Balancer</i>	Azure Load Balancer (Not Application Gateway)	PaaS
<i>Microsoft SQL Server</i>	Azure SQL Database with single database (Microsoft SQL Azure (RTM) - 12.0.2000.8)	PaaS

## Microsoft Azure security policy recommended ports

Data center object	Port	Protocol
Control Room	<ul style="list-style-type: none"> <li>• 80</li> <li>• 443</li> </ul>	Any
LDAP	<ul style="list-style-type: none"> <li>• 3268</li> <li>• 3269</li> </ul>	Any
email SMTP	587	Any
SSH	22	Any
RDP	3389	TCP

## Google Cloud Platform security policy recommended ports

Data center object	Port	Protocol
Load balancer	<ul style="list-style-type: none"> <li>• 80</li> <li>• 443</li> </ul>	<ul style="list-style-type: none"> <li>• HTTP</li> <li>• HTTPS</li> </ul>
Firewall	<ul style="list-style-type: none"> <li>• 80</li> <li>• 443</li> <li>• 1433</li> </ul>	<ul style="list-style-type: none"> <li>• HTTP</li> <li>• HTTPS</li> <li>• TCP</li> </ul>
Microsoft SQL Server database	1433	TCP

**Related tasks**[Prepare for installation on Amazon Web Services](#)

Use these steps to prepare the Amazon Web Services (AWS) instances for the Control Room installation.

[Verify readiness for installation on Microsoft Azure](#)

Use these steps to configure third-party products for the Control Room installation.

**Related reference**[Automation 360 On-Premises prerequisites](#)

Determine whether the system has the required hardware and software to install Control Room for Automation 360 On-Premises.

[Add Automation 360 Cloud DNS to trusted list](#)

To ensure secure access to Automation 360 cloud services, add specific Automation Anywhere Domain Name System (DNS) to the safe recipients or trusted list.

## Control Room repository requirements

The repository location is configured in the Control Room after installation. All your automations are stored in this repository.

Before you configure the Control Room server repository, review the repository requirements for deploying Automation 360 On-Premises.

- For a single node Control Room deployment, the repository can be a local folder.  
For example, `C:\Automation360\Automation Anywhere Server Files`.
- For a multiple-node Control Room deployment, the repository should be accessible from all Control Room nodes in the cluster over the network.

You can create a file share and access the repository from a local machine. For example, `\<fileserv>\<folder>\Automation Anywhere Server Files`.

The Control Room repository contains server files, such as packages and resource files.

## Microsoft Windows: Control Room repository requirements

Review the following requirements for configuring the repository location of cluster nodes:

- The Control Room uses its service account to connect to the repository, you must have read/write permission to the repository location.
- The repository path must meet the Universal Naming Convention (UNC) requirements.

For details, see [UNC Path](#).

- The repository size depends on the user data.

For details about storage requirements, see [Control Room server requirements](#). For supported file and folder size, see [Bot deployment and concurrent operations](#).

For repository migration requirements, contact your Automation Anywhere representative.

- You can configure the repository using Network File System (NFS) protocols, such as Microsoft Windows, Microsoft Azure Files, and Amazon Elastic File System (EFS) or Amazon FSx.
- Network-attached storage (NAS) uses Server Message Block version 3 (SMBv3) for supported platforms: Microsoft Windows, Amazon Web Services, Microsoft Azure, Google Cloud Platform, and Linux.

## Linux: Control Room configuration using the default repository path

- Ensure that the default path exists in the system and use this default path during the Linux installation.  
After the installation, you can modify the repository path or copy files from one directory to another. Verify that all copied files and folders have the same permissions as before the installation.
- Ensure that permission for the path is `crkernel:controlroom`.
- If there is no permission, add the following permission.

```
sudo chmod -R 775 /opt/automationanywhere/enterprise/appdata
```

- Run the following command to allow users access to the `crkernel:controlroom` path:

```
sudo chown -R crkernel:controlroom /opt/automationanywhere/enterprise/appdata
```

## Linux: Control Room configuration with a user-defined repository path

- Ensure that the default path exists in the system.
- Ensure that permission for the path is `crkernel:controlroom`.
- If there is no permission, add the following permission.

```
sudo chmod -R 775 /CRRepo/AutomationAnywhere
```

- Run the command to allow users access the `crkernel:controlroom` path:

```
sudo chown -R crkernel:controlroom /CRRepo/AutomationAnywhere
```

The `crkernel:controlroom` user is created after the Control Room installation, so set the user permission to a specified repository before performing the final Control Room configuration.

## Browser requirements

Review the browser requirements to access the Control Room.

## Supported browsers for Control Room

---

**Doc correction:** Previously Microsoft Edge based on Chromium was incorrectly documented as a certified browser. Currently, it is **not certified** for Control Room. Microsoft Edge based on Chromium is certified for recording web applications using the Universal Recorder.

---

You can access the Control Room using following browsers:

Browser	Version
Google Chrome	57 or later
Microsoft Internet Explorer	11

To create, edit, and deploy bots, you can open the Control Room on a registered device from the supported browsers. However, to install and register the Bot agent, ensure that you open the Control Room in the Google Chrome browser.

## Supported browsers for bot tasks

You can perform all bot tasks in the supported browsers starting from Build 2545 and later releases.

The following table lists specific bot tasks that are not supported in builds earlier to Build 2545:

Automation 360 version	Google Chrome	Microsoft Internet Explorer
Cloud Build 2545 On-Premises Build 2545 Bot agent 3.3	All bot tasks	All bot tasks
Build 2079 (Cloud) On-Premises Build 2079 Bot agent 2.0.2	All bot tasks, except Credential Vault	Unsupported
Cloud Build 1598 On-Premises Build 1610 Bot agent 1.0.2	All bot tasks	Debugger only
Cloud Build 1082 On-Premises Build 1089 Bot agent 1.0.1	All bot tasks	All bot tasks, except Credential Vault

**Related reference**

[Universal Recorder supported applications and browsers](#)

Use the Universal Recorder to record interactions with objects from the supported technologies.

[Bot agent compatibility](#)

Before you install the Bot agent, ensure it is compatible with the hardware and software in your environment.

## Internationalization, localization, and language support

Automation 360 provides internationalization and localization support for its user interface (UI), automation, and documentation.

Internationalization means that you can automate using supported languages. Localization means the user interfaces are translated to languages supported by Automation Anywhere. Also, these supported languages have been tested and certified to work in that language.

**Internationalization**

Perform automation in various languages to work with localized operating systems and keyboards.

**Encoding format**

UTF-8 is the default encoding format for Automation 360.

**Product documentation**

View the Automation Anywhere documentation in the supported language at <https://docs.automationanywhere.com/>. To view information in one of the supported languages, select the language from the drop-down menu at the top-right of the website. The default language is English for any topic that is not available in another language.

**Interface**

View the user interface for Automation 360 components, including Control Room and IQ Bot, in the supported language.

- Automate applications (web and desktop) with the language UI, text, and controls values (for example, push-button with a language name and combo-box items in language text).
- Provide the language name to a bot, workflow, and report in Control Room.
- Provide the language name to bot schedules, automation name and description, role name and description, a user's first and last names, workload pools, and queues.
- Deploy bots with the language name on Bot Runners.
- View the language entities (names, description, and so on) across all the pages in Control Room.

### Select a language in the user interface

From the Control Room interface, next to the user ID, click the language icon (globe icon) and select a language from the list.

Parts of the Control Room interfaces that are translated do not include the applications or tools that are used within the bots. For example, Microsoft Excel is not translated through the Control Room.

### Automation 360 and Bot Insight

Language	Internationalization (operating system and character set)	Localization (user interface)	Product documentation
Arabic	Available	Not available	Not available
Chinese (Simplified)	Available	Available	Available
Chinese (Traditional)	Available	Available	Available
Danish	Available	Not available	Not available
Dutch (Netherlands)	Available	Not available	Not available
French	Available	Available	Available
German	Available	Available	Available
Hebrew	Available	Not available	Not available
Hungarian	Available	Not available	Not available
Italian	Available	Available	Available
Japanese	Available	Available	Available
Korean	Available	Available	Available
Polish	Available	Not available	Not available
Portuguese	Available	Available	Available
Russian	Available	Available	Not available
Spanish	Available	Available	Available

Language	Internationalization (operating system and character set)	Localization (user interface)	Product documentation
Swedish	Available	Not available	Not available
Turkish	Available	Not available	Not available

## Automation 360 IQ Bot

Language	Internationalization (operating system and character set)	Localization (user interface)	Product documentation
Arabic	Available	Not available	Not available
Chinese (Simplified and Traditional)	Available	Available	Available
French	Available	Available	Available
German	Available	Available	Available
Italian	Available	Available	Not available
Japanese	Available	Available	Available
Korean	Available	Available	Available
Portuguese	Available	Available	Available
Russian	Available	Available	Not available
Spanish	Available	Available	Available

## Discovery Bot

Language	Internationalization (operating system and character set)	Localization (user interface)	Product documentation
Arabic	Available	Not available	Not available
Chinese (Simplified and Traditional)	Available	Available	Available
French	Available	Available	Available
German	Available	Available	Available
Italian	Available	Available	Not available
Japanese	Available	Available	Available
Korean	Available	Available	Available
Portuguese	Available	Available	Available

Language	Internationalization (operating system and character set)	Localization (user interface)	Product documentation
Russian	Available	Available	Not available
Spanish	Available	Available	Available

## Components for Control Room and bot actions

Control Room and bots have additional requirements depending upon the Automation 360 deployment model you choose. Some third party applications are installed with Automation 360.

### Control Room supported platforms

View the listed supported platforms and components for Control Room.

Component	Supported Control Room option
Amazon Web Services Elastic Compute Cloud (EC2)	Required to install Control Room platform.
HTML	Required for Microsoft Azure: Use Load Balancer, not Application Gateway.
Java Database Connectivity (JDBC) driver	Required for Oracle Database.
Linux CentOS or Red Hat Enterprise Linux	Python 3.6 required for Build 6463 and later. Install Control Room platform.
Microsoft Active Directory	Required to configure as either IDaaS or IaaS. For IaaS use Windows 2016.
Microsoft Azure	Required to install Control Room platform.

### Third-party components for bot actions

View the listed third party components for the bot actions.

Component	Automation 360 Plug-in	Supported Bot action
ABBYY FineReader Engine version 12.2.27.12		Required for capturing images in the OCR, AISense, and IQ Bot packages.
Citrix Receiver Version 4.4 LTSR or later	Automation 360 Citrix remote agent	Prerequisite for bot actions on the Bot agent installed on Citrix resident apps.
Citrix Virtual Apps version 6.5 or later	Automation 360 Citrix remote agent	Prerequisite for bot actions on business applications hosted on Citrix server resident apps. Supported with Universal Recorder.

Component	Automation 360 Plug-in	Supported Bot action
IBM WebSEAL		For reverse proxy for Bot Runner.
Microsoft .NET Framework version 4.6.1 or later		For the Recorder package.

## Supported special characters

Use only supported special characters when creating user names and passwords. Supported characters vary depending upon where they are used.

In all of the below listed cases, the standard alphanumeric characters, **a-z**, **A-Z**, **0-9** are supported. The special characters allowed or specifically excluded from particular use are typical to standard English keyboards. See the table below to verify the special characters that can be used in names or passwords.

<b>TLS certificate</b>	Do not use at sign ( @ ) in passwords
<b>Wildcards</b>	The asterisk ( * ) is supported.
<b>Windows</b>	Do not use the pipe (   ) or semicolon ( ; ) in user names or passwords.
<b>Worksheet</b>	Do not use the asterisk ( * ), question mark ( ? ), or bracket left or right ( [ ] ) in the worksheet name.
<b>Database</b>	Do not use percent ( % ) or space ( ) in the database name. Do not use semicolon ( ; ) in the database username or password.

## Supported characters

Characters supported for authentication are acceptable for both user names and passwords. In the table:

- **Supported** means the character is explicitly supported for that use.
- **Do not use** means the character is explicitly not supported for that use.
- **Double dash (--)** means results with using the character for that use are unknown.

Character	Windows authentication	Control Room authentication	Database name, username, or password	JSON Web Token authentication
ampersand ( & )	Supported	Supported	--	Supported
angle bracket, left or right ( < > )	Supported	--	--	--
apostrophe, straight single ( ' )	Supported	--	--	--
asterisk ( * )	Supported	--	--	--
at sign ( @ )	Supported	Supported	--	Supported

Character	Windows authentication	Control Room authentication	Database name, username, or password	JSON Web Token authentication
braces left or right ( { } )	Supported	--	--	--
bracket left or right ( [ ] )	Supported	--	--	--
caret ( ^ )	Supported	--	--	--
colon ( : )	Supported	--	--	--
dollar sign ( \$ )	Supported	Supported	--	Supported
equal sign ( = )	Supported	--	--	--
exclamation point ( ! )	Supported	Supported	--	Supported
hyphen ( - )	Supported	Supported	Supported	Supported
parenthesis, left or right ( ( ) )	Supported	--	--	--
percent ( % )	Supported	Supported	Do not use	Supported
period ( . )	Supported	Supported	Supported	Supported
pipe (   )	Do not use	--	--	--
plus sign ( + )	Supported	--	--	--
number sign ( # )	Supported	Supported	--	Supported
question mark ( ? )	Supported	--	--	--
semicolon ( ; )	Do not use	--	Do not use	--
slash, forward or backward ( / \ )	Supported	--	--	--
space	Supported	--	Do not use	--
underscore ( _ )	Supported	Supported	Supported	Supported

## Citrix integration on Cloud

Automation 360 integration with Citrix enables you to create bots that run tasks on remote Citrix Virtual Apps servers.

### Process overview

Ensure the following tasks are completed before you begin automating tasks in a Citrix environment:

#### Verify credentials and licensing

- Ensure you have the credentials to access the Citrix server.

- Ensure the appropriate Citrix license is available for the Automation Anywhere Enterprise system.

## Install components

Specific Citrix and Automation Anywhere components are required on both the local user machine and the Citrix Virtual Apps server.

### Local machine

1. Install Citrix Receiver.
2. Install the Bot agent. This is automatically installed when you register the local machine with the Control Room.

The Bot agent and Automation Anywhere plug-in for Citrix are installed at the same time if the Citrix Receiver is installed on the local machine.

3. Install the Automation Anywhere plug-in for Citrix.

If the Bot agent is already installed, the Automation Anywhere plug-in for Citrix is automatically installed when the Universal Recorder is initiated.

### Citrix server

1. Install the Automation Anywhere remote agent for Citrix.
2. Register the Automation Anywhere remote agent for Citrix as a Virtual App in the Citrix StoreFront.

## Create a bot

1. From the Citrix StoreFront, run the **AARemoteAgent** and the target application.
2. From the Control Room, create the bot, start the **Recorder**, select the target application, and record your actions on the Citrix server to build your bot.

## Using Citrix architecture with bots

To create and run bots using applications that reside on a Citrix server, see the following resources:

[Using the Recorder on Citrix Virtual Apps servers](#)

The **Record: Capture** cloning action requires specific configurations to capture objects from applications available through the Citrix StoreFront on a remote Citrix Virtual Apps server. Ensure the required components are installed on the local machine and the remote Citrix Virtual Apps server.

### Related tasks

[Using the Recorder on Citrix Virtual Apps servers](#)

The **Record: Capture** cloning action requires specific configurations to capture objects from applications available through the Citrix StoreFront on a remote Citrix Virtual Apps server. Ensure the required components are installed on the local machine and the remote Citrix Virtual Apps server.

[Installing the Citrix required components on local machines](#)

Install the Automation Anywhere components to enable you to use bots on Citrix Virtual Apps servers. Two components are installed: Bot agent and Automation Anywhere plug-in for Citrix.

[Installing Automation Anywhere remote agent for Citrix on Citrix servers](#)

Install the Automation Anywhere remote agent for Citrix on the Citrix Virtual Apps server where the virtualized applications are installed.

## Using the Recorder on Citrix Virtual Apps servers

The **Record: Capture** cloning action requires specific configurations to capture objects from applications available through the Citrix StoreFront on a remote Citrix Virtual Apps server. Ensure the required components are installed on the local machine and the remote Citrix Virtual Apps server.

Complete the steps listed in the following tasks:

- [Installing the Citrix required components on local machines](#)
- [Installing Automation Anywhere remote agent for Citrix on Citrix servers](#)

Create bots with applications running on a remote Citrix Virtual Apps server using the Automation Anywhere remote agent for Citrix.

1. Log in to the Citrix Virtual Apps server StoreFront.
2. Run the Automation Anywhere remote agent for Citrix: Select **Citrix server** > **Citrix StoreFront** > **AARemoteAgent**.  
**AARemoteAgent** is the Citrix name for the Automation Anywhere remote agent for Citrix.
3. Run the target application from the Citrix StoreFront.
4. Log in to your registered local machine with the Bot agent and Citrix Receiver installed.
5. Log in to the Control Room from your registered local machine.
6. Create a new bot or edit an existing bot.

7. Select the auto login feature to log in to a Citrix environment when it is locked or logged off.

---

**Note:** To ensure the auto login works, always log off the Citrix Receiver associated with the Citrix Virtual Apps server before you disconnect.

---

8. Start the **Recorder**.
9. From the **Automation Anywhere Record Application** selection window, select the target application from the drop-down list in the **Window or URL** field, and click **Start recording**.

---

**Note:** The remote application has `\\Remote` label at the end of the application name.

---

10. When the steps to record are completed, click **End recording**.

### Related concepts

[Citrix integration on Cloud](#)

Automation 360 integration with Citrix enables you to create bots that run tasks on remote Citrix Virtual Apps servers.

### Related tasks

[Installing the Citrix required components on local machines](#)

Install the Automation Anywhere components to enable you to use bots on Citrix Virtual Apps servers. Two components are installed: Bot agent and Automation Anywhere plug-in for Citrix.

[Installing Automation Anywhere remote agent for Citrix on Citrix servers](#)

Install the Automation Anywhere remote agent for Citrix on the Citrix Virtual Apps server where the virtualized applications are installed.

## Installing the Citrix required components on local machines

Install the Automation Anywhere components to enable you to use bots on Citrix Virtual Apps servers. Two components are installed: Bot agent and Automation Anywhere plug-in for Citrix.

1. Log in to your local machine.

2. Install Citrix Receiver.

This Citrix component is required to communicate from a local machine to a Citrix virtual application server.

To install the Citrix Receiver, see the Citrix documentation.

3. Register your local machine with the Control Room. This installs the Bot agent.

The Bot agent enables local machine communication with the Control Room.

To install the Bot agent:

- a) Log in to the Control Room through your Automation Anywhere URL.
- b) Navigate to **Devices** in the **Manage** tab.
- c) From the action icons, click **Add local bot agent**.
- d) Click **Connect to my computer**.
- e) Follow the steps outlined in the wizard.
- f) Refresh the **Devices** page and verify that the local device is added.

4. Install Automation Anywhere plug-in for Citrix on your local machine.

The Automation Anywhere plug-in for Citrix provides the Citrix driver. This driver communicates with the Citrix server.

To install the Automation Anywhere plug-in for Citrix:

- a) Log in to the Control Room.
- b) Launch one of the designated events.  
Designated events include: launch **Recorder**, use the **Devices** tab or **Device Status** tab, or run a bot from **Editor**.
- c) Optional: Verify that the Automation Anywhere plug-in for Citrix is installed.  
Check for the file `C:\Program Files (x86)\Citrix\ICA Client\Automation.CitrixDriver.dll`.

### Related concepts

#### [Citrix integration on Cloud](#)

Automation 360 integration with Citrix enables you to create bots that run tasks on remote Citrix Virtual Apps servers.

### Related tasks

#### [Using the Recorder on Citrix Virtual Apps servers](#)

The **Record: Capture** cloning action requires specific configurations to capture objects from applications available through the Citrix StoreFront on a remote Citrix Virtual Apps server. Ensure the required components are installed on the local machine and the remote Citrix Virtual Apps server.

#### [Installing Automation Anywhere remote agent for Citrix on Citrix servers](#)

Install the Automation Anywhere remote agent for Citrix on the Citrix Virtual Apps server where the virtualized applications are installed.

## Installing Automation Anywhere remote agent for Citrix on Citrix servers

Install the Automation Anywhere remote agent for Citrix on the Citrix Virtual Apps server where the virtualized applications are installed.

1. Log in to the Citrix Virtual Apps server.
2. Download the latest version of the Automation Anywhere remote agent for Citrix installer file to the Citrix Virtual Apps server.  
The Automation Anywhere remote agent for Citrix running on the Citrix server interprets data received from Automation 360 and responds appropriately.
  - a) Go to [A-People Downloads page \(Login required\)](#).
  - b) Select and download the Automation Anywhere remote agent for Citrix.
3. Run the Automation Anywhere remote agent for Citrix installer.
  - a) Extract the `AARemoteAgent.zip` file and double-click the `AAE_Remote_Agent_1.0.0.exe` file.
  - b) On the **Automation Anywhere Remote Agent Setup** screen, click **Next**.
  - c) On the **License Agreement** screen, accept the license agreement, and click **Next**.
  - d) On the **Select Destination Folder** screen, click **Browse** to specify a non-default location for installing the remote agent. Click **Next**.  
The default location for installation is set to: `C:\Program Files (X86)\Automation Anywhere\AARemoteAgent`
  - e) On the **Setup Status** screen, track the status of the installation process.
  - f) On the **Setup Wizard Complete** screen, click **Finish** to complete the setup.
4. From the Citrix interface, add the Automation Anywhere remote agent for Citrix application to the Citrix **Delivery Controller**.

This registers the Automation Anywhere remote agent for Citrix as a Virtual App in the Citrix StoreFront.

5. Verify that the Automation Anywhere remote agent for Citrix is available from the Citrix StoreFront. The Citrix StoreFront name for the Automation Anywhere remote agent for Citrix is **AARemoteAgent**.

### Related concepts

[Citrix integration on Cloud](#)

Automation 360 integration with Citrix enables you to create bots that run tasks on remote Citrix Virtual Apps servers.

### Related tasks

[Using the Recorder on Citrix Virtual Apps servers](#)

The **Record: Capture** cloning action requires specific configurations to capture objects from applications available through the Citrix StoreFront on a remote Citrix Virtual Apps server. Ensure the required components are installed on the local machine and the remote Citrix Virtual Apps server.

[Installing the Citrix required components on local machines](#)

Install the Automation Anywhere components to enable you to use bots on Citrix Virtual Apps servers. Two components are installed: Bot agent and Automation Anywhere plug-in for Citrix.

### Related reference

[Components for Control Room and bot actions](#)

Control Room and bots have additional requirements depending upon the Automation 360 deployment model you choose. Some third party applications are installed with Automation 360.

## Automation 360 deployment models

Automation 360 provides multiple deployment options to meet various levels of enterprise cost/price performance and resiliency requirements. This includes installation on single-nodes, highly available (HA) clusters, and disaster recovery (DR) sites.

### Planning

Identify your key requirements before selecting a deployment model. For best results, deploy the same operating systems across the Automation Anywhere Robot Process Automation (RPA) development, testing, and production environments. At minimum, have the exact same OS on both test and production environments.

### Deployment models

At a high-level, there are three ways to deploy or install Automation 360. Each depends on your business continuity requirements.

#### *Single-node deployment*

A single-node deployment hosts the Control Room only on one server or machine.

#### *High availability deployment*

The high availability (HA) deployment model provides failure tolerance for the Control Room servers, services, and databases using a distributed load balancer.

#### *Disaster recovery deployment*

The disaster recovery (DR) deployment model uses high availability (HA) clusters distributed across separate geographic areas.

**Related concepts**[High availability and disaster recovery deployments](#)

High availability (HA) provides a failover solution if a Control Room service, server, or database fails.

Disaster recovery (DR) provides a recovery solution across a geographically separated distance in the event of a disaster that causes an entire data center to fail.

## Single-node deployment

A single-node deployment hosts the Control Room only on one server or machine.

A single-node deployment can be used for proof-of-concepts, demos, testing, and trial runs.

We **do not recommend** the use of single-node deployment for production as it might impact RPA operations and business continuity because of the following reasons:

- **No disaster recovery (single point of failure)** - If the single node fails, RPA operation will be adversely impacted.
- **No high availability** - If the server is taken offline for upgrades or maintenance, RPA operations will be impacted.
- **No RPA up-scaling** - When RPA deployments scale up and users increase, the single node will have to manage the increased load. This might adversely affect the RPA performance.

The primary advantages of single-node deployments include:

- Quick and easy installation and setup
- Additional servers are not required.
- Load balancers and clustering configuration are not required

**Related concepts**[High availability deployment](#)

The high availability (HA) deployment model provides failure tolerance for the Control Room servers, services, and databases using a distributed load balancer.

[Disaster recovery deployment](#)

The disaster recovery (DR) deployment model uses high availability (HA) clusters distributed across separate geographic areas.

## High availability and disaster recovery deployments

High availability (HA) provides a failover solution if a Control Room service, server, or database fails.

Disaster recovery (DR) provides a recovery solution across a geographically separated distance in the event of a disaster that causes an entire data center to fail.

### Overview

The Automation Anywhere implementation of high availability and disaster recovery reduces downtime and maintains continuity of business (CoB) for your automation and bot deployment activities.

**High availability**

Refers to a system or component that is continuously operational for a desirably long period.

**Disaster recovery**

Involves a set of policies and procedures to enable the recovery or continuation of vital infrastructure and systems following a natural or human-induced disaster.

The Automation Anywhere components and configuration leverage your existing HA and DR infrastructure, load balancing, and failover systems to protect your bots and related data. Contact your data center administrator for your approved local HA and DR procedures.

## Required HA and DR infrastructure components

### Distributed approach

The Control Room provides the flexibility to process a large number of requests. Deploy multiple instances of Control Room on multiple physical or virtual servers as required.

[Automation 360 On-Premises prerequisites](#)

### Load balancing

Performed by a load balancer, this is the process of distributing application or network traffic across multiple servers to protect service activities, allowing workloads to be distributed among multiple servers. This ensures bot activity continues on clustered servers.

[Load balancer requirements](#)

### Databases

Databases use their own built-in failover to protect the data. This ensures database data recovery.

Configure **synchronous** replication between the primary (active) and secondary (passive) clustered Microsoft SQL servers in the data center. This ensures consistency in the event of a database node failure.

For synchronous replication, configure the database using publisher and subscriber model in Microsoft SQL Server from the primary disaster recovery site to the secondary disaster recovery site that is at a geographically separated location from the primary site.

[Replicate data between primary and secondary sites](#)

### Related concepts

#### [High availability deployment](#)

The high availability (HA) deployment model provides failure tolerance for the Control Room servers, services, and databases using a distributed load balancer.

#### [Disaster recovery deployment](#)

The disaster recovery (DR) deployment model uses high availability (HA) clusters distributed across separate geographic areas.

#### *High availability deployment*

The high availability (HA) deployment model provides failure tolerance for the Control Room servers, services, and databases using a distributed load balancer.

Based on your resiliency requirements for Automation 360, choose from the following deployment options:

### Single/one node

This deployment model is not considered high availability with only one Control Room node configured in the data center.

### Three nodes

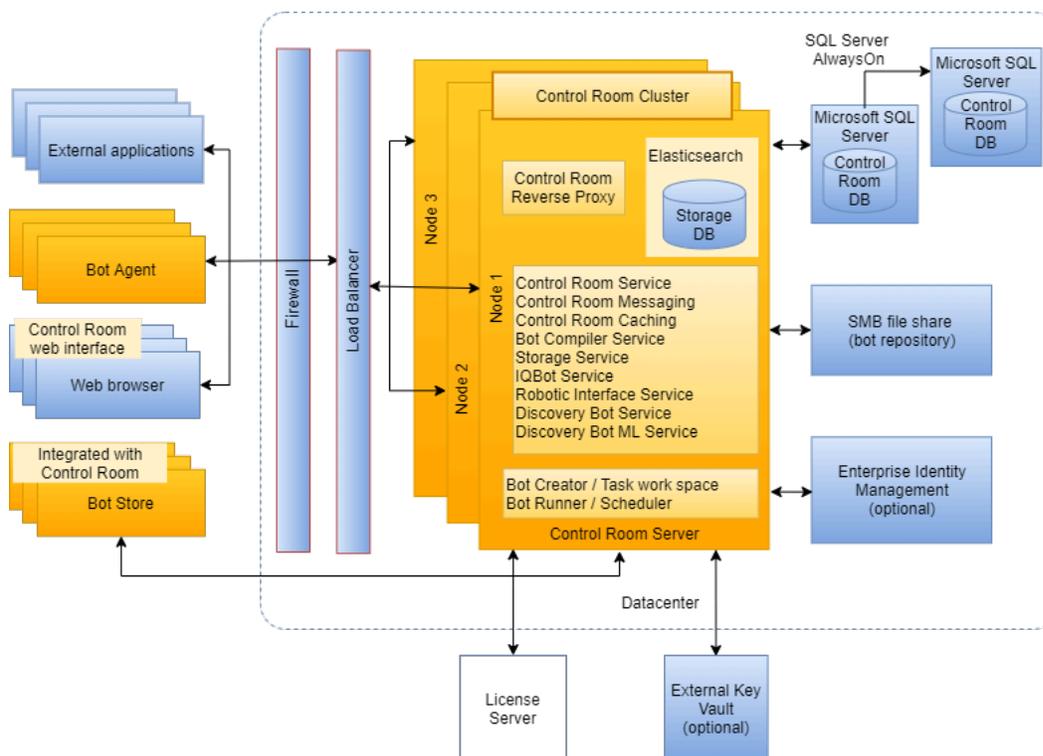
This deployment model is considered full high availability with three Control Room nodes configured in the data center cluster. This is the minimum required deployment model because it supports one node failure at a time.

In Automation 360, a cluster comprising two nodes is referred to as multi-master mode. The multi-master mode can merge inconsistencies but can result in a split-brain condition where the cluster has no majority and cannot resolve transactions, which might result in data inconsistencies. Split-brain condition is a known limitation of clustering systems that can be caused by network issues including latency.

A three-node configuration can help avoid split-brain issues with two-node clusters and increase security by using node authentication and transport layer security (TLS) features.

Automation 360 uses Elasticsearch for distributed operational message storage including audit log messages and application logs. Elasticsearch supports fast query, analytics, and a distributed cluster configuration for redundancy and fail-safe operation.

The following image shows the Automation Anywhere and data center components for three nodes in a data center cluster. The Automation Anywhere components are shown in orange and components provided by your organization are shown in blue.



In this example, the Control Room servers and Microsoft SQL Servers have HA redundancy.

- Multiple users have access to the Control Room cluster through their web browsers. The web browsers communicate to the Control Room cluster through the load balancer.

#### *High availability cluster configuration*

- Multiple devices communicate to the Control Room cluster through the load balancer. This includes API calls from external applications.
- The server message block (SMB) file share and the Microsoft SQL Server store data from the Control Room cluster.
- Microsoft SQL Server uses redundancy through replication syncing to the clustered Microsoft SQL Server.

---

**Important:** Automation Anywhere does not support stretch clusters.

- Ensure that all the HA cluster nodes are configured in the same location. Do not configure the nodes in a single HA cluster that is located across various sites. Ensure that you configure one HA cluster at the primary site and the other HA cluster at the secondary site.
- The Control Room and IQ Bot must be configured in the same data center to ensure communication between both the applications.

---

<b>Pros</b>	Maintains availability when server failures occur within a single data center.
<b>Cons</b>	Does not provide protection against data center outage.
<b>Use cases</b>	Small to medium size businesses that do not require multi-site disaster recovery.

### **Related concepts**

#### [Disaster recovery deployment](#)

The disaster recovery (DR) deployment model uses high availability (HA) clusters distributed across separate geographic areas.

### **Related tasks**

#### [Configure IP cluster](#)

Continue from the Control Room installer to the **Cluster Configuration** wizard page to configure resiliency requirements for the Control Room. Provide only one IP address to configure the Control Room on a single node. Provide multiple (three or more) IP addresses to configure the Control Room for high availability cluster.

#### [Configure disaster recovery site for Elasticsearch IP addresses](#)

If you have configured the Control Room for high availability (HA) and disaster recovery (DR) and installed the Control Room on both the primary and secondary sites, configure Elasticsearch IP addresses for the secondary site.

### **Related reference**

#### [High availability cluster configuration](#)

To support Automation Anywhere in your data center, configure an high availability (HA) cluster. Follow your company methods and procedures for implementing your data center cluster.

### **Related information**

#### [Cluster coordination in ElasticSearch](#)

High availability cluster configuration

To support Automation Anywhere in your data center, configure an high availability (HA) cluster. Follow your company methods and procedures for implementing your data center cluster.

## High availability deployments with clustering

Automation 360 can be deployed in high availability mode where multiple Control Room instances are clustered together using a distributed load balancer. The cluster configuration provides operational fault tolerance because the clustered Control Room can continue to function even when one or more nodes in the cluster experience a failure.

The cluster functions by coordinating transactions between all participating Control Room nodes. The nodes determine which transaction can be processed through voting on each transaction. The number of votes constituting a majority of the nodes in the cluster is referred to as a quorum and determines how many nodes have to vote for or confirm a transaction before it can be processed.

Fault tolerance in terms of node failure is determined by how many nodes can fail before a quorum or majority of nodes is not available to vote on the validity of any transaction. Fault tolerance is optimized with an odd number of nodes in the cluster because a majority in odd-numbered clusters is a lower number than in even-numbered clusters, as shown in the following table:

Number of nodes in cluster	Majority (quorum)	Fault tolerance (node failures)
3	2	1
4	3	1
5	3	2
6	4	2

A cluster with three or more node is much less susceptible to a split-brain condition or inconsistencies due to network issues because the quorum configuration is enforced by default.

## High availability components

To support HA and DR for Automation Anywhere, configure the selected components in your data center for HA.

**Cluster components** - A cluster is a set servers (nodes) that are connected by physical cables and software. In an HA environment, these clusters of servers are allowed to be in the same physical data center.

---

**Note:** In the context of clusters, though the terms server, host, and node each have specific meaning, they are frequently used interchangeably.

---

- **Cluster group (role)** - Group of clustered services that fail-over together and are dependent on each other.
- **Host** - The cluster machine that is hosting the services.
- **Node** - A generic term for a machine in a cluster.
- **Primary node** - The active node in the cluster. The machine where the production activities run.
- **Secondary node** - The machine that is designated as the target in the event of a fail-over. The secondary node is a passive duplicate of the primary node.
- **Server** - The machine in the cluster installed with the server operating system.

HA cluster technologies guard against three specific types of failures:

- **Application and service failures**—affecting application software and essential services.
- **Site failures in multisite organizations**—caused by natural disasters, power outages, or connectivity outages.
- **System and hardware failures**—affecting hardware components such as CPUs, drives, memory, network adapters, and power supplies.

This ability to handle failure allows clusters to meet two requirements that are typical in most data center environments:

- **High availability** - the ability to provide end users with access to a service for a high percentage of time and reduces unscheduled outages.
- **High reliability** - the ability to reduce the frequency of system failure.

#### *Disaster recovery deployment*

The disaster recovery (DR) deployment model uses high availability (HA) clusters distributed across separate geographic areas.

Disaster recovery (DR) is a method where the two high availability (HA) data center configurations are separated geographically. In the event of a localized disaster at the primary site, the physically removed data center on the secondary site can resume functions with minimum downtime.

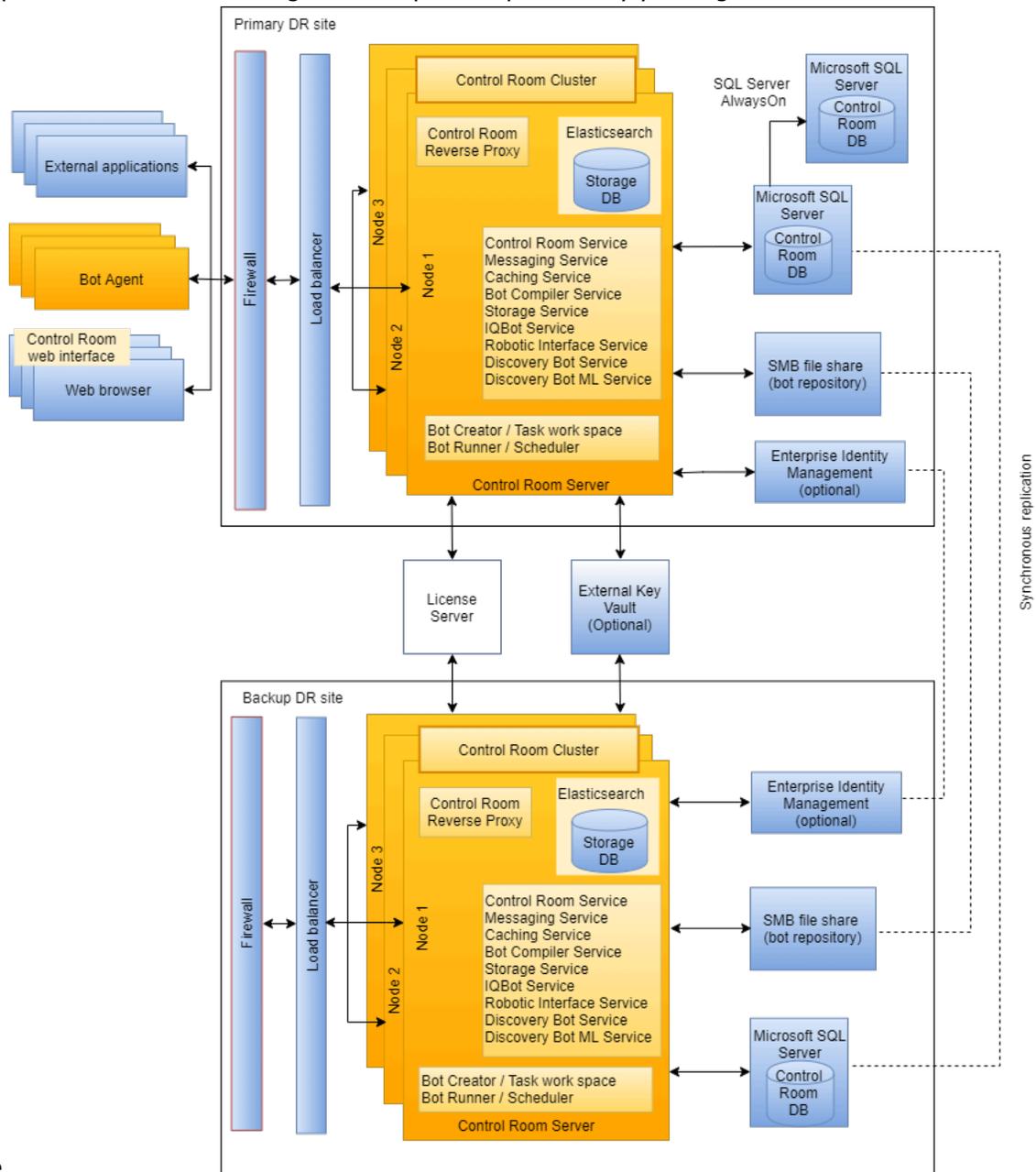
---

**Recommendation:** The Control Room clusters in the primary and secondary disaster recovery sites are recommended to use a minimum of three nodes each because a three-node configuration can help avoid split-brain issues with two-node clusters and increase security by using node authentication and transport layer security (TLS) features.

---

The following image shows the Automation Anywhere and data center cluster components for three nodes in primary and secondary sites configured for disaster recovery. The Automation Anywhere

components are shown in orange and components provided by your organization are shown in blue.



blue.

### Advantage

- Provides business continuity when there is a data center outage or loss.
- Protects and safeguards critical business data.
- Ensures information security compliance.

### Disadvantage

Increased operational burden.

### Related tasks

[Replicate data between primary and secondary sites](#)

Replicate the data between the primary and secondary sites. This process involves database replication using publisher and subscriber models in Microsoft SQL Server Management Studio, server repository replication using Windows Distributed File System (DFS), and backing up Elasticsearch (audit log) data.

#### Related reference

[Disaster recovery configuration](#)

When you configure disaster recovery enabled data centers for Automation 360, ensure specific conditions are met.

#### Related information

[Cluster coordination in ElasticSearch](#)

#### Disaster recovery configuration

When you configure disaster recovery enabled data centers for Automation 360, ensure specific conditions are met.

- **Primary site:** Ensure the primary site is up and running with HA optionally configured.
- **Primary site components:** Ensure the primary site has components such as database, repository, and Elasticsearch data folder configured.
- **AD domain:** Ensure the same Active Directory domain is available to both the primary and secondary sites.
- **Site domains:** Ensure the secondary site Control Room and machines are members of the same domain as the primary site Control Room and machines.
- **Licenses:** Assign floating licenses for users so that they can log in to devices on the backup site.
- **Secondary site services:** Shut down the Control Room services at the secondary site until they are required.
- **Site configurations:** Ensure the machines at the primary site and secondary site have the same specification and configuration. This includes the Control Room, Bot Runners, associated devices, and login credentials. This is a requirement to ensure an equal level of service during an outage.
- **Schedules:** Ensure schedules, after they are created, are stored in the database in UTC format. This ensures the schedules run as specified in the production environment.

---

**Note:** Schedules are stored in Coordinated Universal Time (UTC) and therefore run at the same time, regardless of the physical location or time zone settings of the server.

---

- **Bot agent:** Ensure the secondary site Bot agent have the exact same configurations as the primary site Bot agent they are mapped to.

#### Related tasks

[Replicate data between primary and secondary sites](#)

Replicate the data between the primary and secondary sites. This process involves database replication using publisher and subscriber models in Microsoft SQL Server Management Studio, server repository replication using Windows Distributed File System (DFS), and backing up Elasticsearch (audit log) data.

[Perform disaster recovery failover](#)

Perform the required failover steps for Automation 360 recovery at the physically remote secondary site after a disaster at the primary site.

#### Replicate data between primary and secondary sites

Replicate the data between the primary and secondary sites. This process involves database replication using publisher and subscriber models in Microsoft SQL Server Management Studio, server repository replication using Windows Distributed File System (DFS), and backing up Elasticsearch (audit log) data.

Before installing Automation 360, ensure that you have set up your secondary site.

Configure the database and shared repository in the secondary site that is used for disaster recovery. Back up your Elasticsearch data by setting up the backup cluster.

- 1. Replicate the database** from the primary site to the secondary site using the publisher and subscriber models in Microsoft SQL Server Management Studio.

---

**Recommendations:**

- Use the Microsoft SQL Server Developer or Enterprise edition for database replication.  
The publisher and subscriber versions should be the same, or the gap between the two versions should not be more than two releases. For example, do not use Microsoft SQL Server 2012 publisher with Microsoft SQL Server 2019 subscriber.
- Configure the publisher and distributor on the same machine to avoid latency in data sharing.  
Use different machines only for load distribution, for example, for data larger than 200 GB.

- 
- a) Connect to the primary database to create a snapshot publication for your local publications.
  - b) Add the tables and views as articles.
  - c) Use the snapshot agent option to create a snapshot and keep the snapshot available to initialize subscriptions.
  - d) Schedule the snapshot agent to back up the data at regular intervals (for example, every 10 seconds from 12 AM to 11:59:59 PM).
  - e) To select the account to run the snapshot agent, configure the security and agent settings.
  - f) Add a publication option.
  - g) Run all agent and distributors after ensuring the publisher and database names are correct.
  - h) To add subscribers to the local subscriptions, connect to the database server and provide connection details for the database at the secondary site.

For detailed steps, see [Database Mirroring and Replication \(SQL Server\)](#).

- 2. Replicate the repository** (bots and data files) using the Windows Distributed File System (DFS) from the primary site to the secondary site.

- a) Open the Distributed File System on the machine where the shared repository is saved.
- b) Create a new multipurpose replication group to add replication group members.  
The group members include the source machine in the primary site and the destination machine in the secondary site to store the shared repository.
- c) Use the full mesh option for DFS replication groups composed of less than 10 servers.
- d) Use the full bandwidth option to replicate the data continuously.
- e) Add the machine where you are configuring the repository as a primary member.
- f) Add a backup folder for the shared repository from the destination machine.
- g) Verify the data is replicated in the backup folder on the destination machine.

For detailed steps, see [Distributed File System Replication](#).

- 3. Back up the Elasticsearch (audit log) data** by adding the secondary site cluster IP address in the Control Room on the primary site.

For detailed steps, see [Configure disaster recovery site for Elasticsearch IP addresses](#).

In case of a disaster, [Perform disaster recovery failover](#).

**Related tasks**[Perform disaster recovery failover](#)

Perform the required failover steps for Automation 360 recovery at the physically remote secondary site after a disaster at the primary site.

## Perform disaster recovery failover

Perform the required failover steps for Automation 360 recovery at the physically remote secondary site after a disaster at the primary site.

Complete the disaster recovery deployment on the two geographically separated sites, where one site is the primary (active) site and the other is the secondary (passive) site used for backup. If the primary site cluster fails, perform recovery on the secondary site.

---

**Recommendation:** The secondary site should be set up as a passive configuration so that the failover procedure can be performed without delay.

---

The procedure is identical regardless of whether you are switching over from primary to secondary, or from the secondary to primary sites. Connect the Control Room to the replicated database and shared the repository on the secondary site.

These steps apply to all the servers in the Automation 360 cluster, including the Control Room servers, SQL server, and Elasticsearch server.

1. Install Automation 360 on the secondary site.  
Follow the steps for installation up to the database configuration.  
[Installing Control Room using Custom mode](#)
2. In the **Database Configuration** window, add database details for the secondary site such as the database server IP address and default port number.  
[Configure database type and server](#)
3. Verify the Elasticsearch details in the **Provide Elasticsearch Credentials** window.  
Because the Elasticsearch data is already replicated from the primary database, you do not have to provide the Elasticsearch password.
4. After the installation is complete, verify that the Control Room URL and repository path is available in the Control Room **Welcome** page.  
You can change the Control Room URL and repository path after you log in to the Control Room as the next step.
5. Log in to the Control Room using your administrator credentials to change the **Configuration Settings** in **Administration > Settings**:
  - a) To allow users to access the Control Room using a public IP address, change the **Control Room Access URL** settings to point to the secondary site access URL in **General Settings > General**.
  - b) Change the **Repository path** to the secondary site repository path in **Control Room database and software > Control Room repository**.

6. Verify the data for the following:
  - Users, roles, schedule, triggers, credential information, and workload settings
  - Elasticsearch certificate and connectivity
  - Automation Anywhere Robotic Interface, Bot Insight, Discovery Bot, and IQ Bot

---

**Recommendation:** Perform a byte-by-byte measurement of the recovered data and compare the primary and secondary site data. If you see any difference, verify the subscriber logs for any intermittent failure due to any network issue.

---

After the recovery site is operating as the primary site, configure a replacement secondary site. Using the database tools, set up replication from the recovery primary site to the replacement secondary site.

## Installing Control Room using Custom mode

Log in to the server as an administrator and install Automation Anywhere Control Room in Custom mode to select installation and configuration options, including installing non-default requirements. Select this mode for a data center deployment.

---

**Linux users:** See [Installing Control Room on Linux](#).

---

### Procedure

1. Prepare for installation

- Verify [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file

2. [Run Control Room installer](#)

Run the installer to verify the operating system and hardware requirements, select the deployment option, accept the licensing agreement, and select the installation file path.

3. [Configure external key vault integration](#)

Use the **External key vault integration** page to configure a connection to an external key vault such as CyberArk or AWS Secrets Manager, that is optionally used for retrieving credentials for either installation or runtime purposes. Configuring the key vault connection enables retrieval options for credentials during installation. Ensure that you have the follow information:

- All necessary database and user credentials.
- Any necessary credential requirements for the external key vault such as secret keys, application IDs. See the specific requirements for your external key vault on the External Key Vault integration configure page.

4. [Configure application Transport Layer Security](#)

Use the **Transport Layer Security (TLS) configuration** page to generate a self-signed certificate or import a security certificate to set up a highly secure Control Room instance.

**5.** *Configure service credentials*

Use the **Service Credentials** page to specify the account that will be used to run all Windows services that are created by the installer.

**6.** *Configure database type and server*

Use the **Database type** page to configure the Microsoft SQL Server database for use with the Control Room.

**7.** *Add Elasticsearch credentials*

Add Elasticsearch credentials for enhanced monitoring and alerting in the Control Room.

**8.** *Configure IP cluster*

Use the **Cluster Configuration** page to configure resiliency requirements. Provide only one IP address to configure the Control Room on a single node. Provide multiple (three or more) IP addresses to configure the Control Room for high availability cluster.

**9.** *Review the installation summary*

Use the **Ready to Install the Program** page to complete the installation wizard and monitor the installation progress.

**10.** Complete Control Room configuration and validation*Complete Control Room post-installation configuration*

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First-time access to the Control Room walks you through the configuration for your authentication method.

*Post-installation user management*

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First-time access to the Control Room walks you through the configuration for your authentication method.

**11.** *Prepare for users*

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

**Related concepts**[Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

## Run Control Room installer

Run the installer to verify the operating system and hardware requirements, select the deployment option, accept the licensing agreement, and select the installation file path.

To install Automation Anywhere Control Room in Custom Mode, follow these steps:

1. Start the installer wizard.
  - a) Extract all files from the `AutomationAnywhere_Setup.zip` file.
  - b) Right-click the `AutomationAnywhere.exe` file and select **Run as administrator**.

The installation process creates the Control Room database with the name Automation360-Database on your SQL database server instance.

---

**Note:** Ensure the SQL database server is installed on a different server than that of the Control Room.

---

The installation process checks for supported operating system and recommended hardware requirements. The following message appears if the requirements are not met:

```
This system does not meet all the installation prerequisites for Automation
Anywhere Enterprise.
Some features might not work as expected after installation. For details,
verify the Control Room Installation Prerequisite.
```

For more information, see [Automation 360 On-Premises prerequisites](#).

2. Select the **On-Premises** deployment type and click **Next**.  
In On-Premises deployment type, the Control Room, Bots and files are installed on your servers. In **Cloud-enabled** deployment type, all data such as bots and files are installed on your servers. The management functions of the Control Room are delivered through Cloud.
3. Accept the licensing agreement and click **Next**.
4. Select the **Custom** option and click **Next**.  
The **Destination Folder** page appears. By default, the destination folder is `C:\Program Files\Automation Anywhere\Enterprise\`.
5. To make changes to the destination folder, click **Change**, enter a new destination folder name, and click **OK**.

---

**Recommendation:** Do not install the application directly in the root directory (`C:\`). You should create a folder, for example, `C:\Program Files\Automation Anywhere\Automation360\`.

---

6. Click **Next**.

## Configure external key vault integration

Automation 360 provides for integration with third-party key vault technology including CyberArk and AWS Secrets Manager.

### Prerequisites for AWS key vault integration

The following information is required for configuring AWS key vault integration:

<b>Region</b>	Each AWS Region is designed to be isolated from the other AWS Regions.
<b>AWS Key</b>	Provide the AWS access key. For installations this key must also be an environment variable configured on the Control Room Server.
<b>AWS Secret Key</b>	Secret access key. AWS does not allow retrieval of a secret access key after its initial creation. For installations this key must also be an environment variable configured on the Control Room Server.

**AWS Session Token**

installations require the session token must be an environment variable configured on the Control Room Server.

**Credential Identifiers to be used during installation**

- Database credentials
- Service Account Credentials

**Prerequisites for CyberArk integration**

The following is required information for configuring CyberArk integration:

**Central Credential Provider API URL**

The CyberArk CCP URL endpoint on the CyberArk server.

**CyberArk Application ID**

The CyberArk issued Application ID.

**Certificate used to authenticate to CyberArk**

Control Room Client Certificate trusted by CyberArk AAM server. The certificate will be distributed in a passphrase protected file, you will need to enter the passphrase.

**Optional Certificate**

You can optionally load the CyberArk AIM Server certificate to the trust store here to make sure that the will trust the CyberArk server.

**Credential Identifiers to be used during installation**

- Safe and Object Name
- Database credentials
- Service Account Credential

Credentials used by the platform for services including database connections, Active Directory integration, and Simple Mail Transport Protocol (SMTP) can be configured for retrieval from the integrated external key vault.

1. From the Automation 360 installation wizard, select external key vault and enter the authentication information as required:

External key vault	Authentication settings
<b>AWS Secrets Manager</b>	Enter the <b>Region</b> , <b>AWS Key</b> , and <b>Secret Key</b> for the AWS Secrets Manager.
<b>CyberArk</b>	Enter the <b>CyberArk endpoint URL</b> , <b>application ID</b> , and <b>certificate trusted by the CyberArk CCP endpoint</b> .

2. Click **Next**.

*Configure application Transport Layer Security*

## Utility for key vault and database authentication configuration

This interactive utility helps the user to change the key vault and database authentication configurations.

User will execute this utility using the JRE that is being used by the control room, in the installation directory `C:\Program Files\Automation Anywhere\Enterprise`.

Download the jar file that will be used, click [External key vault utility](#).

## Argument variables

- `-configPath`

Full path of the configuration directory.

- `-action`

Select from the following:

- `UPDATE_KEY_VAULT_CONFIGURATION`

This allows for the mapping to an external key, based on these three options:

- `AWS`  
Connect to AWS Secret Manager.
- `CYBERARK`  
Connect to CyberArk.
- `NONE`  
Disable external key vault.

- `UPDATE_DB_AUTHENTICATION_CONFIGURATION`

Configure SQL authentication settings.

- `WINDOWS`  
Change to Windows authentication.
- `SQL`  
To change to SQL authentication where user provides username and password.
- `KEY_VAULT`  
To change to SQL authentication using external key vault.

---

**Note:** The client certificate issued to the Control Room for authenticating to CyberArk needs to be in .p12 (pkcs#12) format with the private key.

---

**Note:** The imported CyberArk server certificate needs to be imported to Java trust store before invoking dbutility commands. The certificate can be in .cer (PEM) format and does NOT contain a private key.

---

## Command

Execute this command within the directory `C:\Program Files\Automation Anywhere\Enterprise:`

```
> jdk11\bin\java --module-path .\lib\ -jar crutils.jar -configPath <Full path of the config directory> -action <UPDATE_KEY_VAULT_CONFIGURATION/UPDATE_DB_AUTHENTICATION_CONFIGURATION>
```

## Metrics for UPDATE\_KEY\_VAULT\_CONFIGURATION

These are the metrics used by the UPDATE\_KEY\_VAULT\_CONFIGURATION action.

Table 2: Key vault configuration metrics

Source → Destination	AWS	CYBERARK	NONE
AWS	YES	NO	YES
CYBERARK	NO	YES	YES
NONE	YES	YES	YES

---

### Note:

- To change KEY\_VAULT from one type of vault to another or to NONE, you must first manually set database and service account credentials that are currently being retrieved from the external key vault.
  - To change AWS to/from CYBERARK, user has to first change it to NONE.
  - To change NONE from AWS/CYBERARK, database should not be connected on KEY\_VAULT.
- 

This utility will prompt the user to provide specific input information based on the options selected.

## UPDATE\_KEY\_VAULT\_CONFIGURATION

### AWS

Region →

Region to get secrets from on AWS secret manager.

### CYBERARK

- Vault URL →

URL of the CyberArk password vault.

- Application ID →

The application identifier.

- Certificate Path →

Full path of the client certificate file.

- Passphrase →

Passphrase for the client certificate.

---

**Note:** Sometimes you will have to import a server certificate. Please follow these steps:

In the directory: C:\Program Files  
\Automation Anywhere\Enterprise, execute the following:

1. Enter

```
> jdk11\bin\java -jar certmgr.jar
-appDir . -importTrustCert <Full
path of the certificate>
```

2. Add these jvm arguments to the command for executing this utility.

a.

```
-
Djavax.net.ssl.trustStore="C:
\Program Files\Automation
Anywhere\Enterprise\pki
\trust\store.ks"
```

b.

```
-
Djavax.net.ssl.trustStorePassword=changeit
```

```
> jdk11\bin\java -
Djavax.net.ssl.trustStore="C:
\Program Files\Automation Anywhere
\Enterprise\pki\trust\store.ks" -
Djavax.net.ssl.trustStorePassword=changeit
--module-path lib -jar crutils.jar
-configPath <Full path of
the config directory> -action
<UPDATE_KEY_VAULT_CONFIGURATION/
UPDATE_DB_AUTHENTICATION_CONFIGURATION>
```

**NONE**

- If DB authentication is configured to use external key vault, the utility will throw exception as:

```
Database currently configured
to retrieve credentials from
key vault. Update database
authentication to WINDOWS/SQL to
proceed further
```

and exit.

- The utility might ask a confirmation to user:

```
Disable/update of key vault
may impact functionalities
using key vault (e.g. Active
Directory configuration, Email
Settings configuration). Make
sure to update these settings (if
any). Are you sure you want to
continue?
```

## UPDATE\_DB\_AUTHENTICATION\_CONFIGURATION

**WINDOWS**

The utility will use the current logged-in user credential to connect to the DB provided during installation.

**SQL**

- Username

- Password

## KEY VAULT

The utility will ask the user to provide input based on the key vault, and the connected control room.

### 1. AWS

Secret name → Name of the secret created on AWS secret manager of type database credentials or Plain Text with username and password as keys.

### 2. CYBERARK

Safe name → Name of the safe which has the credential.

Object name → Name of the credential.

### 3. NONE

The utility will send exception as

```
Key Vault configuration not found
```

and exit.

## Configure application Transport Layer Security

Use the **Transport Layer Security (TLS) configuration** wizard page from the Automation 360 installer to generate a self-signed certificate or import a security certificate to set up a highly secure Control Room instance.

All Automation Anywhere components should be secured with TLS 1.2 encryption. Automation Anywhere leverages TLS 1.2 encryption for HTTPS and TCP communications between our components. The TLS certificates are installed on the Automation Anywhere Control Room and IQ Bot servers. The certificates are installed in .PFX format and leveraged for communications.

---

**Note:** If your load balancer uses HTTP to forward traffic to the Control Room, do not use the **Enable Force HTTP traffic to HTTPS** option. We recommend that you use HTTPS to forward the load balancer traffic for enhanced security instead.

---

1. In the **TLS Configuration** page, configure the following:

- **Generate a Self-Signed Certificate**

Enabling the **Self-Signed Certificate** option allows the installer to generate a unique private key and a self-signed certificate for the Control Room.

- **Import a Certificate**

To import a custom certificate, clear the **Self Signed Certificate** check box. This setting allows you to import a certificate using the **Certificate Path** field.

---

**Note:** The certificate file must be a PKCS12 format.

---

Provide the following information:

- **Certificate Path:** Click **Browse** to import the certificate.
  - **Private Key Password:** Enter the password for the private key.
- 

**Password limitation:** Do not use the at sign (@) in passwords. Using the special character @ in the password causes the certificate file import to fail.

---

- **Webserver Port:** Enter the web server port – either HTTP or HTTPS. If the port is already assigned, an error message is displayed.
- 



**Attention:** The port validation message is also displayed when you add 8080 for the web server and if that port is already in use for a Control Room license service. Use a different unassigned port in these cases.

---

- **Enable Force HTTP traffic to HTTPS:** This option redirects all HTTP port requests to HTTPS. To access to the Control Room through HTTPS using the generated self-signed certificate, ensure the port numbers are different for HTTP and HTTPS.

To generate a custom certificate for HTTPS, ensure your custom certificate meets the following:

- Create a `.pfx` certificate with a pass code from a CA trusted authority.
- Combine Root, Intermediate, and Machine level certificates into a single certificate.
- Use the format `[WS Machine Host Name].[DomainName].com` for the private key.
- Include the host name as a fully qualified domain name (FQDN) in the certificate.

You provide the host name during Control Room installation.

- In multi-node HA clusters, issue certificates to the load balancer DNS name.
- Add individual URLs, which require access to all nodes, to the `Subject Alternative Name` field in the certificate.

For more information, see Automation Anywhere support site: [Automation 360 On-Premises prerequisites \(A-People login required\)](#).

2. Click **Next** to configure service credentials.

*[Configure service credentials](#)*

### Related tasks

[Configure Control Room for HTTPS certificate](#)

Configure Control Room for HTTPS mode using a self-signed or CA certificate either before or after performing a custom Control Room configuration.

#### [Import HTTPS and CA certificates](#)

After installing the Control Room, import a certificate for HTTPS, Certificate Authority (CA), or both using the Windows or Linux command prompt.

## Configure database type and server

Continue from the Control Room installer to the **Database type** wizard page. Use this page to configure the Microsoft SQL Server database for use with the Control Room.

This procedure applies only to Microsoft Windows Server based installations.

---

**Linux users:** See [Installing Enterprise Control Room on Linux - Database configuration](#).

---

1. Select the **Microsoft SQL Server** database.  
An instance of the SQL Server should be already configured.
2. Click **Next**.  
The **Database Server** page is displayed (if you selected **SQL Server** for configuring your database).

### 3. Set the connection and authentication for the database server.

---

#### Note:

- If possible, do not set the value for **Database Server** as **localhost**. If you must use **localhost**, note that the **Secure Connection** to the database will not work.
- Click **Browse** to select the SQL Server instance where the Control Room database will be created. Alternatively, enter a database server name or select one from the list.

---

**Migration task:** If you are migrating from 11.x to Automation 360, browse to the restored 11.x database.

Provide the following details:

- a) **Database Port:** Use the default port (1433) or specify a custom value.

*Configure default database port*

- b) **Use Secure Connection:** Select to use a CA certificate as specified.

---

**Note:** Use the same host name for certificate and database connections.

- c) **Certificate:** This option is enabled when you select **Use Secure Connection**. Browse to select a CA certificate.

*Import HTTPS and CA certificates*

- d) Select one of the following for database authentication:

- **Windows authentication:** This option is selected by default and allows connection to the SQL Server using Windows authentication.

---

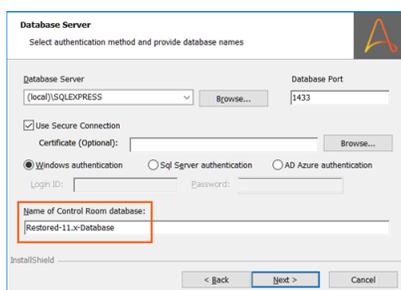
**Note:** If you select Windows authentication, then the user running the installer is used to test that the database exists, create it if required, and grant `db_owner` to the service account user (NT Authority/System).

- **SQL Server authentication:** (manually enter credential) Select this option to use SQL Server authentication to connect to the database. Provide the correct user name and password for SQL authentication.
  1. Enter username.
  2. Enter password.
- **AD Azure authentication:** Select this option to use Microsoft Azure Active Directory credentials to connect to the database when you install the Control Room on Microsoft Azure.

Use only supported characters for the user name and password. See *Supported special characters*. Do not use semicolons ( ; ) in the database password.

- e) **Name of Control Room database:** Enter the name of the Control Room database.

**Migration task:** If you are migrating from 11.x to Automation 360, enter the name of the restored database in the database field as shown in the following image:



4. Click **Next** to provide the Elasticsearch credentials.

*Add Elasticsearch credentials*

## Configure default database port

Configure and enable the TCP/IP in the SQL database server to use the default port 1433 when you install the Control Room.

Enable TCP/IP from the Microsoft SQL Server Configuration Manager.

1. Ensure the SQL Server Browser service is running in the Task Manager.
2. To set the default port for the SQL database server, launch the Microsoft SQL Server Configuration Manager.
3. Select **SQL Server Network Configuration > Protocols for <SQL server instance>**.
4. Right-click **Protocols for <SQL server instance>** and select **Open** to show the available protocols.
5. Ensure **TCP/IP** is enabled.
6. Right-click **TCP/IP** and select **Properties**.  
You can configure the default port for the SQL database from the **TCP/IP Properties** window that is displayed.
7. Select the **IP Addresses** tab to update the default **TCP Port** to **1433** in the **IPAll** node.  
If provided, clear the value shown in the **TCP Dynamic Ports** field.
8. Click **OK** to confirm and exit the window.
9. Select the **SQL Server Services** option to **Restart** the **SQL Server <instance name>**.  
The SQL database server is now configured and enabled to use the default port in the Control Room.

## Add Elasticsearch credentials

When installing Automation 360, add Elasticsearch credentials for enhanced monitoring and alerting in the Control Room.

Based on whether you are performing a new installation, running the setup for the first time to upgrade to a later version, or a subsequent re-installation, the options to add the Elasticsearch credentials or select a backup Elasticsearch server are enabled.

1. In the **Provide Elasticsearch Credentials** window, enter the credentials for Elasticsearch in the **Elasticsearch password** field.

---

### Important:

- The Elasticsearch password must be same as the primary Control Room node password.
- Ensure the following for your Elasticsearch authentication password:
  - The password cannot include a space, semicolon (;), percent (%), or backslash (\).
  - The first character cannot be a minus sign (-) or forward slash (/).

- Include at least one alphabetical character.
- Change your password before the Control Room installation.

---

This option is enabled only for the master node of the cluster when you run the setup for the first time for an upgrade or a new installation of the Control Room. When you enter the password, self-signed certificates are generated for encrypting the data traffic for inter-node and client communication.

The option is disabled for subsequent installations because the password and certificates are retrieved and reused from the second node onwards.

**2.** Repeat the credentials in the **Confirm Elasticsearch password** field.

**3.** Select the **Check only if installing on the first node of the backup Elasticsearch cluster** check box when you want to install the Control Room on the first node that will be used as a backup for the Elasticsearch cluster.

This option is available only if you have provided the Elasticsearch credentials for the master node during a previous installation. The option enables you to use the database backup that is created from the Elasticsearch settings table after the master node of the cluster is installed.

The option is disabled for subsequent installations.

**4.** Click **Next** to configure the IP cluster.

If you encounter any issues restarting the Automation Anywhere Elastic Search Service, see [Automation 360 v.16 upgrade error: Elasticsearch Service fail to start during certificate retrieval process \(A- People login required\)](#).

## Configure IP cluster

Continue from the Control Room installer to the **Cluster Configuration** wizard page to configure resiliency requirements for the Control Room. Provide only one IP address to configure the Control Room on a single node. Provide multiple (three or more) IP addresses to configure the Control Room for high availability cluster.

To install the Control Room in cluster mode:

- Ensure you have configured the default/custom and configurable firewall, port, and protocol requirements for Automation 360 deployment.
- Ensure the network location (UNC) path is configured to access the repository files from all Control Room nodes in the cluster.

You can configure Network Attached Storage (NAS) file sharing using Server Message Block (SMB) protocol.

- Ensure that all nodes that will be configured for the IP cluster are available for configuration before the installation. Also, provide the same list of IP addresses in the same order in all the nodes that are of the cluster when you install Control Room in these nodes.
- Ensure the existing cluster is in yellow or green state and all ports on the new node are open before adding a new node.

- Ensure to sign all the PowerShell files if the machine on which you are installing Automation 360 has MachinePolicy as AllSigned or UnRestricted. To view the MachinePolicy on your machine, run the following command in PowerShell:

```
Get-ExecutionPolicy -List
```

You can find the following PowerShell files in the temp folder:

- servicecredsvalidate
- getsysip
- getfileprodversion
- ecertprocess
- createstorageables
- createpddtables
- createiqbottables
- createcrdbtables
- createaaridbtables

Example of a temp folder path C:\Users\ADMINI~1.FD\AppData\Local\Temp\<GUID>. Note that the GUID is generated dynamically for each installer session.

---

**Remember:** Before you upgrade from a previous version, shut down the nodes gradually, and not at the same time, to ensure that the cluster does not fail.

---

1. Select the **Enable Cluster Setup** check box.
  - To install the Control Room on a single node and not a cluster, clear the **Enable Cluster Setup** check box.
  - The check box is enabled by default if the machine on which the setup is being run has local IP addresses configured.
  - The check box is not available for selection if your MachinePolicy is set to AllSigned or UnRestricted and the PowerShell files are not signed.
2. If the nodes in your network use IPv6 address, select the **IPv6** check box.
3. Enter the IP addresses of the nodes in the cluster.
  - a) Use a comma (,) to specify more than one IP address.  
For example, to specify three IP addresses in the cluster, enter:  
192.0.2.1,192.0.2.2,192.0.2.3

---

**Important:** The first IP address in the list is used as the master node. Ensure that you enter the IP addresses in the same order on all node configurations in subsequent installations. An incorrect order causes the application to configure the IP addresses as separate clusters, which will result in data loss when the issue is fixed after installation.

---

You can install multiple nodes at the same time after the master node is initially installed. After installation, you can add a new IP address to the cluster at the end of the list. However, you cannot change the IP address version (for example from IPv4 to IPv6).

  - b) After you enter the cluster IP addresses correctly, select a valid address IP at the message prompt to provide network access to the machine.
4. Select a private IP address from the **Local IP Address** drop-down list.  
If multiple local IP addresses are configured on the machine, select the IP address on which the Control Room is installed because it will be used by other nodes to access the Control Room.

- Click **Next** to complete the Control Room installation process.  
Optionally see the [Setup installation summary](#) page.

### Related concepts

#### [High availability deployment](#)

The high availability (HA) deployment model provides failure tolerance for the Control Room servers, services, and databases using a distributed load balancer.

### Related tasks

#### [Configure application Transport Layer Security](#)

Use the **Transport Layer Security (TLS) configuration** wizard page from the Automation 360 installer to generate a self-signed certificate or import a security certificate to set up a highly secure Control Room instance.

### Related reference

#### [Control Room repository requirements](#)

The repository location is configured in the Control Room after installation. All your automations are stored in this repository.

#### [High availability cluster configuration](#)

To support Automation Anywhere in your data center, configure an high availability (HA) cluster. Follow your company methods and procedures for implementing your data center cluster.

#### [Ports, protocols, and firewall requirements](#)

View the default and configurable firewall, port, and protocol requirements for Automation Anywhere deployment.

## Setup installation summary

Continue from the Control Room installer to the **Ready to Install the Program** wizard page. From this stage of the installation wizard, you finish the installation wizard and monitor the installation progress.

- Click **Next**.

The **Ready to Install the Program** screen appears.

- Click **Install** and allow the installation process to complete.

The **InstallShield Wizard Completed** screen appears.

- Click **Finish**.

Launch Automation Anywhere is enabled by default.

Enable **Show installer settings** to open the `aae-installsummary.html` file. By default, this is located at `C:\Program Files\Automation Anywhere\Enterprise\`. Use this file to view a summary of the installation.

Complete the Control Room configuration and validation.

- [Complete Control Room post-installation configuration](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

- [Post-installation user management](#)

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

- [User management](#)

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

### Related tasks

[Installing Control Room using Express mode](#)

## Installing Control Room using Express mode

Log in to the servers as an Administrator and install Automation Anywhere Control Room in Express Mode using the default settings.

---

**Linux users:** See [Installing Control Room on Linux](#).

---

- Verify [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file




---

**Attention:** This installation mode is ideal for demo and training purposes. This installation mode is **not recommended** for the production environment.

---

The Express Mode installation quickly sets up the Control Room with default parameters for the various components.

### Default parameters

Microsoft SQL Server is the default database for Control Room.

The following parameters are installed by default:

Parameter	Default value
SQL database instance	SQLEXPRESS
Authentication type	Windows authentication
Control Room database	Automation360-Database
Port	1433

To install Automation Anywhere Control Room in Express Mode, follow these steps:

1. Log in to the installation server.

2. Start the installer wizard.
  - a) Extract all files from the `AutomationAnywhere_Setup.zip` file.
  - b) Right-click the `AutomationAnywhere.exe` file and select **Run as administrator**.

The installation process creates the Control Room database with the name Automation360-Database on your SQL database server instance.

---

**Note:** Ensure the SQL database server is installed on a different server than that of the Control Room.

---

The installation process checks for supported operating system and recommended hardware requirements. The following message appears if the requirements are not met:

```
This system does not meet all the installation prerequisites for Automation
Anywhere Enterprise.
Some features might not work as expected after installation. For details,
verify the Control Room Installation Prerequisite.
```

For more information, see [Automation 360 On-Premises prerequisites](#).

3. Click **Next** on the **Welcome to the Setup Wizard** page.
4. Select one of the following deployment types and click **Next**:

Deployment type	Description
<b>On-Premises</b>	The Control Room, Bots and files are installed on your servers.
<b>Cloud-enabled</b>	All data such as bots and files are installed on your servers. The management functions of the Control Room are delivered through Cloud.

5. Accept the licensing agreement and click **Next**.
6. On the **Installation Type** page, select the **Express** option and click **Next**.

The **Database Configuration** page appears.

- a) Enter the port you want to use to connect to the database server in the **Port** field.  
The default port is 1433. The installer uses the first available port and checks the availability of each consecutive port.
- b) Select any one of the following options to connect to the database server.

Option	Action
<b>Use Windows Authentication</b>	The system uses your Windows credentials. The <b>Username</b> and <b>Password</b> fields are disabled in the installer.

Option	Action
<b>Sql Server authentication</b>	Enter the <b>Username</b> and <b>Password</b> used for connecting to the database server.

---

**Note:** The user who connects to the database server must have database creator privileges.

---

- c) Enter the name of the database that you want to use for Control Room in the **Name of Control Room** database field.
- d) Enter the name of the database you want to use for Bot Insight in the **Name of Bot Insight database** field.

7. Click **Next**.

8. On the **Ready to Install the Program**, click **Install** and allow the installation process to complete.

9. On the **InstallShield Wizard Completed** page, click **Finish**.

Launch Automation Anywhere is enabled by default.

Enable **Show installer settings** to open the `aae-installsummary.html` file. By default, this is located at `C:\Program Files\Automation Anywhere\Automation360\`. Use this file to view a summary of the installation.

The Control Room launches in your default browser with the Configure Control Room settings page displayed. Proceed to [Complete Control Room post-installation configuration](#).

#### Related concepts

##### [Installing Control Room using Custom mode](#)

Log in to the server as an administrator and install Automation Anywhere Control Room in Custom mode to select installation and configuration options, including installing non-default requirements. Select this mode for a data center deployment.

## Installing Control Room on Amazon Web Services

Login to an Amazon Web Services (AWS) server instance as Administrator. Then download and start the Control Room installer and select **Custom** mode.

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

### Step 1: Prepare for installation

- Verify [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file

### Step 2: [Prepare for installation on Amazon Web Services](#)

Use these steps to prepare the Amazon Web Services (AWS) instances for the Control Room installation.

**Step 3:** *Customize Control Room installation on Amazon Web Services*

Install and apply the customized configuration required for the Control Room cluster on Amazon Web Services (AWS) after completing initial preparations.

**Step 4: Complete Control Room configuration and validation.***Complete Control Room post-installation configuration*

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

*Post-installation user management*

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

**Step 5: Prepare for users.***User management*

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Prepare for installation on Amazon Web Services

Use these steps to prepare the Amazon Web Services (AWS) instances for the Control Room installation.

If you have not done so already, prepare your AWS Identity and Access Management (IAM) user account to login to the AWS Console.

Do the following:

1. Create AWS Elastic Compute Cloud (EC2) Instances for the Control Room Servers.
2. If you use RDS, create Relational Database Service (RDS) Instances for the SQL Server Enterprise 2014 Database server.
3. Configure the AWS Load Balancer.

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

To prepare AWS instances, do the following:

1. Set up the *Microsoft SQL Server* on Amazon Web Services Elastic Compute Cloud (AWS EC2) or Relational Database Service (RDS).  
AAE supports both. For a comparison of the two, see *Microsoft SQL Server on AWS*.
2. Test the database connection with the Microsoft SQL Server.
  - a) Install Microsoft SQL Management Studio on one of the AWS EC2 instances inside the Virtual Private Cloud (VPC).  
For more information, see *Download SQL Server Management Studio*.
  - b) Connect to the Microsoft SQL Server.  
For configuration information, see *Working with SQL Servers*.
  - c) (Skip this step if the master database user installs the Control Room). Create the following empty database and assign `db_owner` privileges to the master database user for the Automation360-Database.
3. Set up the shared repository.
  - a) Create an AWS EC2 instance as a Windows File Server with an additional volume of 100 GB.
  - b) Join the Active Directory domain.
  - c) Create a folder and set up the permissions for the repository.



**Attention:** Only the Control Room admin is to have full access to this folder because this is the account from which all Control Room services run.

---

4. Launch two AWS instances, one for each Control Room server.
  - a) Establish two AWS instances, each with the following configuration:
    - Type: c5.2xlarge or similar instance type (8 CPU, 16 GB RAM)
    - Storage: Root Device: 100 GB
    - Storage: Additional Device: D:\ 200 GB (For Automation Anywhere Install files)
    - Accidental Deletion Prevention: Enabled
  - b) Access the two instances through Remote Desktop Protocol.
  - c) Add the instances to the Active Directory domain.
  - d) For each instance, add the Control Room system admin as a local administrator on the computer and reboot the system.
5. Configure the firewall and port.  
See *Ports, protocols, and firewall requirements*.
6. Set up the AWS Application Load Balancer.  
See *Details for Elastic Load Balancing Products*.
  - Disable the stickiness attribute.
  - Set the idle time-out to 120 seconds.

## 7. Upload the SSL certificate to the Load Balancer.

Continue with [Customize Control Room installation on Amazon Web Services](#).

## Customize Control Room installation on Amazon Web Services

Install and apply the customized configuration required for the Control Room cluster on Amazon Web Services (AWS) after completing initial preparations.

If you have not done so already, complete the initial installation steps in [Prepare for installation on Amazon Web Services](#).

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

To install the Control Room in a cluster setup, do the following steps:

1. Login to the first AWS instance as an Administrator.
2. Download `Automation Anywhere_<version>.exe`.
3. Click **Next** on the **Welcome to the Setup Wizard** page.
4. Accept the licensing agreement and click **Next**.
5. Select the **Custom** option and click **Next**.

The **Destination Folder** page appears. By default, the destination folder is `C:\Program Files\Automation Anywhere\Enterprise\`.

6. To make changes to the destination folder, click **Change**, enter a new destination folder name, and click **OK**.

---

**Recommendation:** Do not install the application directly in the root directory (`C:\`). You should create a folder, for example, `C:\Program Files\Automation Anywhere\Enterprise\`.

---

7. Click **Next** to configure the IP cluster.

8. Select the **Enable Cluster Setup** check box.

The check box is enabled by default if the machine on which the setup is being run has local IP addresses configured.

To install the Control Room on a single node and not a cluster, clear the **Enable Cluster Setup** check box.

9. Enter the IP addresses of the nodes in the cluster.

- a) Use a comma (,) to specify more than one IP address.

For example, to specify three IP addresses in the cluster, enter:

```
192.0.2.1,192.0.2.2,192.0.2.3
```

---

**Important:** The first IP address in the list is used as the master node. Ensure that you enter the IP addresses in the same order on all node configurations in subsequent installations. An incorrect order causes the application to configure the IP addresses as separate clusters, which will result in data loss when the issue is fixed after installation.

---

You can install multiple nodes at the same time after the master node is initially installed.

After installation, you can add a new IP address to the cluster at the end of the list.

- b) After you enter the cluster IP addresses correctly, select a valid address IP at the message prompt to provide network access to the machine.

10. Click **Next** to configure the application Transport Layer Security (TLS).

**11.** In the **TLS Configuration** page, configure the following:

- **Generate a Self-Signed Certificate**

Enabling the **Self-Signed Certificate** option allows the installer to generate a unique private key and a self-signed certificate for the Control Room.

- **Import a Certificate**

To import a custom certificate, clear the **Self Signed Certificate** check box. This setting allows you to import a certificate using the **Certificate Path** field.

---

**Note:** The certificate file must be a PKCS12 format.

---

Provide the following information:

- **Certificate Path:** Click **Browse** to import the certificate.
- **Private Key Password:** Enter the password for the private key.

---

**Password limitation:** Do not use the at sign (@) in passwords. Using the special character @ in the password causes the certificate file import to fail.

---

- **Webserver Port:** Enter the web server port – either HTTP or HTTPS. If the port is already assigned, an error message is displayed.




---

**Attention:** The port validation message is also displayed when you add 8080 for the web server and if that port is already in use for a Control Room license service. Use a different unassigned port in these cases.

---

- **Enable Force HTTP traffic to HTTPS:** This option redirects all HTTP port requests to HTTPS. To access to the Control Room through HTTPS using the generated self-signed certificate, ensure the port numbers are different for HTTP and HTTPS.

To generate a custom certificate for HTTPS, ensure your custom certificate meets the following:

- Create a `.pfx` certificate with a pass code from a CA trusted authority.
- Combine Root, Intermediate, and Machine level certificates into a single certificate.
- Use the format `[WS Machine Host Name].[DomainName].com` for the private key.
- Include the host name as a fully qualified domain name (FQDN) in the certificate.

You provide the host name during Control Room installation.

- In multi-node HA clusters, issue certificates to the load balancer DNS name.
- Add individual URLs, which require access to all nodes, to the `Subject Alternative Name` field in the certificate.

For more information, see Automation Anywhere support site: [Automation 360 On-Premises prerequisites \(A-People login required\)](#).

**12.** Click **Next** to configure the service credentials.

**13.** In the **Service Credentials** screen, choose from the listed options.

The Windows Service credentials include a user name and password. The user specified must meet these requirements:

- A member of the local system administrator group.
- Have permission to manage services, including Automation Anywhere services.
- If you use Windows authentication to connect to the SQL database, ensure you grant the `db_owner` permission to the service credential user.

These service credentials allow the Control Room processes to run the required services.

- **Local System Account**—(default) The logged-on user performing the installation
- **Domain Account**—Specify a user that is not the local system account user
  - a. Clear the **Local System Account** check box.
  - b. Enter the user name and password for the domain account.
 

Use only supported characters for the user name and password. See [Supported special characters](#).
- **Do not use the Windows domain credentials**

Enter credentials valid for running Automation Anywhere services. Without the valid credentials, the Control Room will fail to launch.
- **PowerShell script restrictions**

Specify a user with permissions to launch PowerShell scripts who is not a Windows domain user. Without the relevant permissions, database table creation can fail.

**14.** Add the SQL Server and click **Next**.

Select **Microsoft SQL Server**, type the **Name**, and click **Next**.

**15.** On the **InstallShield Wizard Completed** page, click **Finish**.

Launch Automation Anywhere is enabled by default.

Enable **Show installer settings** to open the `aae-installsummary.html` file. By default, this is located at `C:\Program Files\Automation Anywhere\Enterprise\`. Use this file to view a summary of the installation.

The Control Room launches in your default browser with the Configure Control Room settings page shown. Continue with [Configure settings post-installation on Amazon Web Services](#).

## Configure settings post-installation on Amazon Web Services

After installation is complete, configure Control Room settings on Amazon Web Services.

If you have not done so already, complete the installation steps in [Customize Control Room installation on Amazon Web Services](#).

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

To install Automation Anywhere on Amazon Web Services (AWS), do the following steps:

1. Configure the following Control Room settings:
  - a) Specify the host name URL by providing the AWS Load Balancer URL.  
This is the URL that users use to access your installation of Control Room.
  - b) Select the Active Directory authentication type. For more information, see [Configure Control Room for Active Directory: manual mode](#).
2. After you configure the Control Room, install product licenses.
3. Test Control Room access using the AWS Load Balancer URL.  
This completes the Control Room installation on AWS.

Complete the Control Room configuration and validation.

- [Complete Control Room post-installation configuration](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

- [Post-installation user management](#)

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

- [User management](#)

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Installing Control Room on Microsoft Azure

Installing Control Room on Microsoft Azure begins in the Azure environment and ends with configurations in the Control Room.

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

### Step 1: Prepare for installation.

- Verify [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file

### Step 2: [Verify readiness for installation on Microsoft Azure](#)

Use these steps to configure third-party products for the Control Room installation.

### Step 3: [Begin Control Room installation on Microsoft Azure](#)

Initial steps for Control Room installation on Microsoft Azure.

**Step 4:** *Customize Control Room installation on Microsoft Azure*

Install and apply the customized configuration required for the Control Room cluster on Microsoft Azure.

**Step 5: Complete Control Room configuration and validation.***Complete Control Room post-installation configuration*

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

*Post-installation user management*

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

**Step 6: Prepare for users.***User management*

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Verify readiness for installation on Microsoft Azure

Use these steps to configure third-party products for the Control Room installation.

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

To configure third-party products prior to installation, do the following steps:

1. Ensure the installation environment meets the data center requirements and collect the necessary information about the following components:

- Load balancer - IP address
- Microsoft SQL Server - port credentials
- Azure SMB file share - address credentials
- Enterprise identity management system (optional)

If you have Active Directory (AD) - AD server domain credentials

- SMTP - host port HTTP/S ports for TLS (optional)
- Control Room servers - Have Windows credential manager installed

Refer to [Supported data center component versions on Microsoft Azure](#) for configuration and version information.

2. Configure the Network Security Group as per the recommended security policies for Inbound Port rules:

Data center object	Port	Protocol
Control Room	<ul style="list-style-type: none"> <li>• 80</li> <li>• 443</li> </ul>	Any
LDAP	<ul style="list-style-type: none"> <li>• 3268</li> <li>• 3269</li> </ul>	Any
email SMTP	587	Any
SSH	22	Any
RDP	3389	TCP

3. Configure the AD server.

Ensure all users are part of the AD domain and the AD server is setup in IaaS mode for Azure cluster environment installations. To add user, navigate to **Active Directory Users and Computers > <domain> > Users** and add the necessary user.

To configure the AD server on Azure with IDaaS, refer to the [Microsoft Azure documentation](#).

4. Ensure the Control Room servers in the cluster can ping each other.

If the ping is not successful:

- a) Enable the following below file and printer sharing firewall rule:

```
File and Printer Sharing (Echo Request - ICMPv4-In) File and Printer
Sharing All Yes Allow No Any Any Any ICMPv4
```

- b) Ping the Control Room after enabling the firewall rule change.

When you have completed the pre-installation configurations, [Begin Control Room installation on Microsoft Azure](#).

## Supported data center component versions on Microsoft Azure

The supported operating system versions for installing Automation Anywhere Automation 360 on the Microsoft Azure cluster environment are identified for each component.

Data center object	Supported version	Configuration
Control Room operating system	<ul style="list-style-type: none"> <li>Microsoft Windows Server 2012 and 2012 R2 Datacenter</li> <li>Microsoft Windows Server 2016 Standard and Datacenter</li> <li>Microsoft Windows Server 2019 Standard and Datacenter</li> </ul>	IaaS
Identity management: Azure <i>Active Directory</i>	Azure Active Directory	<ul style="list-style-type: none"> <li>IDaaS</li> <li>Windows 2016 for IaaS</li> </ul>
<i>SMB File Share</i>	Azure File Share	PaaS
<i>Load Balancer</i>	Azure Load Balancer (Not Application Gateway)	PaaS
<i>Microsoft SQL Server</i>	Azure SQL Database with single database (Microsoft SQL Azure (RTM) - 12.0.2000.8)	PaaS

## Begin Control Room installation on Microsoft Azure

Initial steps for Control Room installation on Microsoft Azure.

If you have not done so already, complete the pre-installation configuration in [Verify readiness for installation on Microsoft Azure](#).

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

To begin the installation:

1. Use Remote Desktop Connection (RDC) to connect to the Control Room server, as an Administrator, and run the Control Room installer.
2. Click **Yes** to start the installer.
3. Click **Next** on the **Welcome to the Setup Wizard** page.
4. Accept the licensing agreement and click **Next**.
5. Select the **Custom** option and click **Next**.
6. Click **Next** to setup the system IPs.  
The **Cluster Configuration** window displays.

Continue with [Customize Control Room installation on Microsoft Azure](#).

## Customize Control Room installation on Microsoft Azure

Install and apply the customized configuration required for the Control Room cluster on Microsoft Azure.

If you have not done so already, complete the initial installation steps in [Begin Control Room installation on Microsoft Azure](#). This task requires the configuration information you gathered in the prerequisites stage. This includes IP addresses, certificates, and credentials for the the Control Room servers, datacenter servers, and databases.

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

To install the Control Room in a cluster setup, do the following steps:

**1.** Select the **Enable Cluster Setup** check box.

The check box is enabled by default if the machine on which the setup is being run has local IP addresses configured.

To install the Control Room on a single node and not a cluster, clear the **Enable Cluster Setup** check box.

**2.** Enter the IP addresses of the nodes in the cluster.

a) Use a comma (,) to specify more than one IP address.

For example, to specify three IP addresses in the cluster, enter:

```
192.0.2.1,192.0.2.2,192.0.2.3
```

---

**Important:** The first IP address in the list is used as the master node. Ensure that you enter the IP addresses in the same order on all node configurations in subsequent installations. An incorrect order causes the application to configure the IP addresses as separate clusters, which will result in data loss when the issue is fixed after installation.

---

You can install multiple nodes at the same time after the master node is initially installed.

After installation, you can add a new IP address to the cluster at the end of the list.

b) After you enter the cluster IP addresses correctly, select a valid address IP at the message prompt to provide network access to the machine.

**3.** Click **Next** to configure the application Transport Layer Security (TLS).

4. In the **TLS Configuration** page, configure the following:

- **Generate a Self-Signed Certificate**

Enabling the **Self-Signed Certificate** option allows the installer to generate a unique private key and a self-signed certificate for the Control Room.

- **Import a Certificate**

To import a custom certificate, clear the **Self Signed Certificate** check box. This setting allows you to import a certificate using the **Certificate Path** field.

---

**Note:** The certificate file must be a PKCS12 format.

---

Provide the following information:

- **Certificate Path:** Click **Browse** to import the certificate.
- **Private Key Password:** Enter the password for the private key.

---

**Password limitation:** Do not use the at sign (@) in passwords. Using the special character @ in the password causes the certificate file import to fail.

---

- **Webserver Port:** Enter the web server port – either HTTP or HTTPS. If the port is already assigned, an error message is displayed.




---

**Attention:** The port validation message is also displayed when you add 8080 for the web server and if that port is already in use for a Control Room license service. Use a different unassigned port in these cases.

---

- **Enable Force HTTP traffic to HTTPS:** This option redirects all HTTP port requests to HTTPS. To access to the Control Room through HTTPS using the generated self-signed certificate, ensure the port numbers are different for HTTP and HTTPS.

To generate a custom certificate for HTTPS, ensure your custom certificate meets the following:

- Create a `.pfx` certificate with a pass code from a CA trusted authority.
- Combine Root, Intermediate, and Machine level certificates into a single certificate.
- Use the format `[WS Machine Host Name].[DomainName].com` for the private key.
- Include the host name as a fully qualified domain name (FQDN) in the certificate.

You provide the host name during Control Room installation.

- In multi-node HA clusters, issue certificates to the load balancer DNS name.
- Add individual URLs, which require access to all nodes, to the `Subject Alternative Name` field in the certificate.

For more information, see Automation Anywhere support site: [Automation 360 On-Premises prerequisites \(A-People login required\)](#).

5. Click **Next** to configure the service credentials.

**6.** In the **Service Credentials** screen, choose from the listed options.

The Windows Service credentials include a user name and password. The user specified must meet these requirements:

- A member of the local system administrator group.
- Have permission to manage services, including Automation Anywhere services.
- If you use Windows authentication to connect to the SQL database, ensure you grant the `db_owner` permission to the service credential user.

These service credentials allow the Control Room processes to run the required services.

- **Local System Account**—(default) The logged-on user performing the installation
- **Domain Account**—Specify a user that is not the local system account user
  - a. Clear the **Local System Account** check box.
  - b. Enter the user name and password for the domain account.

Use only supported characters for the user name and password. See [Supported special characters](#).
- **Do not use the Windows domain credentials**

Enter credentials valid for running Automation Anywhere services. Without the valid credentials, the Control Room will fail to launch.
- **PowerShell script restrictions**

Specify a user with permissions to launch PowerShell scripts who is not a Windows domain user. Without the relevant permissions, database table creation can fail.

**7.** Click **Next** to configure database type and server.

## 8. Set the connection and authentication for the database server.

### Note:

- If possible, do not set the value for **Database Server** as **localhost**. If you must use **localhost**, note that the **Secure Connection** to the database will not work.
- Click **Browse** to select the SQL Server instance where the Control Room database will be created. Alternatively, enter a database server name or select one from the list.

**Migration task:** If you are migrating from 11.x to Automation 360, browse to the restored 11.x database.

Provide the following details:

- a) **Database Port:** Use the default port (1433) or specify a custom value.

*Configure default database port*

- b) **Use Secure Connection:** Select to use a CA certificate as specified.

**Note:** Use the same host name for certificate and database connections.

- c) **Certificate:** This option is enabled when you select **Use Secure Connection**. Browse to select a CA certificate.

*Import HTTPS and CA certificates*

- d) **Windows authentication:** This option is selected by default and allows connection to the SQL Server using Windows authentication.

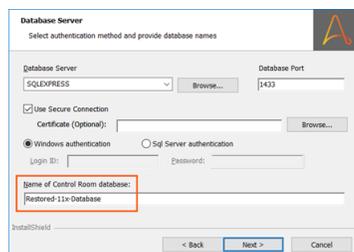
**Note:** If you select Windows authentication, then the user running the installer is used to test that the database exists, create it if required, and grant `db_owner` to the service account user (NT Authority/System).

- e) **SQL Server authentication:** Select this option to use SQL Server authentication to connect to the database. Provide the correct user name and password for SQL authentication.

Use only supported characters for the user name and password. See *Supported special characters*. Do not use semicolons ( ; ) in the database password.

- f) **Name of Control Room database:** Enter the name of the Control Room database.

**Migration task:** If you are migrating from 11.x to Automation 360, enter the name of the restored database in the database field as shown in the following image:



## 9. Click **Next**.

## 10. On the **Ready to Install the Program**, click **Install** and allow the installation process to complete.

**11.** On the **InstallShield Wizard Completed** page, click **Finish**.

Launch Automation Anywhere is enabled by default.

Enable **Show installer settings** to open the `aae-installsummary.html` file. By default, this is located at `C:\Program Files\Automation Anywhere\Enterprise\`. Use this file to view a summary of the installation.

The Control Room launches in your default browser with the Configure Control Room settings page shown. Continue with [Configure settings post-installation on Microsoft Azure](#).

## Configure settings post-installation on Microsoft Azure

After Control Room installation is complete, use the Microsoft Azure Portal to configure the clusters. Use the Azure Portal to configure Windows credentials, Control Room settings for repository and URL, master key for Credential Vault, Active Directory authentication, and optionally SMTP settings.

If you have not done so already, complete the installation steps in [Customize Control Room installation on Microsoft Azure](#).

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

1. From the Azure Portal where [SMB File Share](#) is setup, get the Connection String to retrieve following parameters:
  - Internet or network address
  - User name
  - Password
2. Locate the Window Credential Manager on the control room server and click **Add a Windows Credential**.
3. Enter the credential information.

---

**Note:** Adding a user under Windows Credential Manager needs to be repeated on all the servers used for testing in the cluster environment (Control Room, Clients/Devices).

---

4. Enter information and click **Save and Continue**.  
Repository path is extracted from SMB File Share and Control Room access URL in is a load balancer Public IP.
5. **Copy** the Master Key and save it (it will be needed to restart the services).
6. Select Express mode and click **Save and Continue**.
7. Enter the Active Directory authentication configuration information, including URL, Domain username, and password, then click **Check Connection**. If settings are correct, click **Next**.
8. Enter the AD user created previously and click **Check name in Active Directory**. Upon validation, click **Save and Log in**.  
Create additional users as needed and create corresponding users in the Control Room.
9. Optional: Continue with installing other control room nodes in the cluster.
10. Perform the SMTP registration.

---

**Note:** A real SSL certificate is recommended for use with deployments.

---

This completes the Control Room installation on Microsoft Azure.

Complete the Control Room configuration and validation.

- *Complete Control Room post-installation configuration*

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

- *Post-installation user management*

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

- *User management*

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Installing Control Room on Google Cloud Platform

Log in to a Google Cloud Platform (GCP) server instance as administrator. Then download and start the Control Room installer and install in Custom mode.

---

**Note:** There are many possible system configurations and requirements. These installation steps do not account for all those possibilities so your specific setup and installation steps will vary and Automation Anywhere does not make any warranties that these steps conform with your specific configurations.

---

1. Complete the prerequisites for installation:

- Verify *Automation 360 On-Premises prerequisites*.
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file

2. *Prepare to install Control Room on Google Cloud Platform*

Ensure that you complete the required steps to prepare the Google Cloud Platform instances for installing the Control Room.

3. *Perform custom installation of Control Room on Google Cloud Platform*

Install and apply the customized configuration required for the Control Room cluster on Google Cloud Platform after completing initial preparations.

4. *Configure Google Cloud Platform settings after installation*

After installing the Control Room, configure the required settings on Google Cloud Platform.

5. Complete the Control Room configuration and validation.

- a) *Complete Control Room post-installation configuration*

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

- b) *Post-installation user management*

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

## 6. *Manage your users*

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Prepare to install Control Room on Google Cloud Platform

Ensure that you complete the required steps to prepare the Google Cloud Platform instances for installing the Control Room.

### 1. Configure the Network Security Group of all the servers as specified in the following list:

- Name: aarestrictedsecuritygroup
- Type: Ingress
- Targets: aarestrictedsecuritygroup
- Filters: IP ranges: List of IP addresses provided by the IT security team
- Protocols and ports: all
- Action: Allow
- Priority: 1000
- Network: default

---

**Note:** In the IP address ranges field, enter all the IP addresses of all the virtual machines (VMs) in the cluster environment.

---

### 2. Set up the F5 load balancer with the following configurations:

- Select **standard** as the type option.
- Enter `0.0.0.0/0` as the Source address in Host.
- Enter `F5-LB-Private IP` as the Destination Address/Mask in Host.
- Enter `80` as the Port and select **HTTP** as the Service Port.
- Select the **Notify Status to Virtual Address** check box.
- Enable the load balancer state.

To use SSL offload with the F5 load balancer, provide the SSL certificate at the load balancer level, and configure your Control Room application servers to use HTTP mode only.

---

**Recommendation:** Your IT team should configure the F5 load balancer with the Control Room.

---

3. Set up pools and nodes with the following configurations:
  - a) Update the pool properties:
    - Choose a basic configuration.
    - Select ICMP as your gateway to monitor health.
  - b) Update the pool member options:
    - Choose the round-robin method for load balancing.
    - Disable the priority group activation.
  - c) Update the node properties:
    - Change the state to enabled.
    - Select node-specific health monitors.
    - Select ICMP as your gateway to monitor health.
4. Configure the Active Directory server.  
Verify that all the VMs in the cluster can ping each other using private IP addresses.
5. Connect using RDP to one of the Control Room nodes or servers and run the Control Room installer.  
The Installation Prerequisite Check verifies that your system has the basic configurations required for Automation Anywhere. See [Automation 360 On-Premises prerequisites](#).

*Perform custom installation of Control Room on Google Cloud Platform*

## Perform custom installation of Control Room on Google Cloud Platform

Install and apply the customized configuration required for the Control Room cluster on Google Cloud Platform after completing initial preparations.

If you have not done so already, complete the initial installation steps: [Prepare to install Control Room on Google Cloud Platform](#).

1. Log in to the first Google Cloud Platform instance as an administrator.
2. Download the `Automation Anywhere__<version>.exe` file.  
[A-People Downloads page \(Login required\)](#)
3. Run the installer file.
4. Click **Next** on the **Welcome to the Setup Wizard** page.
5. Accept the licensing agreement and click **Next**.
6. Select the **Custom** option and click **Next**.  
The **Destination Folder** page appears. By default, the destination folder is `C:\Program Files\Automation Anywhere\Enterprise\`.
7. To make changes to the destination folder, click **Change**, enter a new destination folder name, and click **OK**.

---

**Recommendation:** Do not install the application directly in the root directory (`C:\`). You should create a folder, for example, `C:\Program Files\Automation Anywhere\Enterprise\`.

---

8. Click **Next** to configure the IP cluster.

**9.** Select the **Enable Cluster Setup** check box.

The check box is enabled by default if the machine on which the setup is being run has local IP addresses configured.

To install the Control Room on a single node and not a cluster, clear the **Enable Cluster Setup** check box.

**10.** Enter the IP addresses of the nodes in the cluster.

- a) Use a comma (,) to specify more than one IP address.

For example, to specify three IP addresses in the cluster, enter:

```
192.0.2.1,192.0.2.2,192.0.2.3
```

---

**Important:** The first IP address in the list is used as the master node. Ensure that you enter the IP addresses in the same order on all node configurations in subsequent installations. An incorrect order causes the application to configure the IP addresses as separate clusters, which will result in data loss when the issue is fixed after installation.

---

You can install multiple nodes at the same time after the master node is initially installed.

After installation, you can add a new IP address to the cluster at the end of the list.

- b) After you enter the cluster IP addresses correctly, select a valid address IP at the message prompt to provide network access to the machine.

**11.** Click **Next** to configure the application Transport Layer Security (TLS).

**12.** In the **TLS Configuration** page, configure the following:

- **Generate a Self-Signed Certificate**

Enabling the **Self-Signed Certificate** option allows the installer to generate a unique private key and a self-signed certificate for the Control Room.

- **Import a Certificate**

To import a custom certificate, clear the **Self Signed Certificate** check box. This setting allows you to import a certificate using the **Certificate Path** field.

---

**Note:** The certificate file must be a PKCS12 format.

---

Provide the following information:

- **Certificate Path:** Click **Browse** to import the certificate.
- **Private Key Password:** Enter the password for the private key.

---

**Password limitation:** Do not use the at sign (@) in passwords. Using the special character @ in the password causes the certificate file import to fail.

---

- **Webserver Port:** Enter the web server port – either HTTP or HTTPS. If the port is already assigned, an error message is displayed.




---

**Attention:** The port validation message is also displayed when you add 8080 for the web server and if that port is already in use for a Control Room license service. Use a different unassigned port in these cases.

---

- **Enable Force HTTP traffic to HTTPS:** This option redirects all HTTP port requests to HTTPS. To access to the Control Room through HTTPS using the generated self-signed certificate, ensure the port numbers are different for HTTP and HTTPS.

To generate a custom certificate for HTTPS, ensure your custom certificate meets the following:

- Create a `.pfx` certificate with a pass code from a CA trusted authority.
- Combine Root, Intermediate, and Machine level certificates into a single certificate.
- Use the format `[WS Machine Host Name].[DomainName].com` for the private key.
- Include the host name as a fully qualified domain name (FQDN) in the certificate.

You provide the host name during Control Room installation.

- In multi-node HA clusters, issue certificates to the load balancer DNS name.
- Add individual URLs, which require access to all nodes, to the `Subject Alternative Name` field in the certificate.

For more information, see Automation Anywhere support site: [Automation 360 On-Premises prerequisites \(A-People login required\)](#).

**13.** Click **Next** to configure the service credentials.

**14.** In the **Service Credentials** screen, choose from the listed options.

The Windows Service credentials include a user name and password. The user specified must meet these requirements:

- A member of the local system administrator group.
- Have permission to manage services, including Automation Anywhere services.
- If you use Windows authentication to connect to the SQL database, ensure you grant the `db_owner` permission to the service credential user.

These service credentials allow the Control Room processes to run the required services.

- **Local System Account**—(default) The logged-on user performing the installation
- **Domain Account**—Specify a user that is not the local system account user
  - a. Clear the **Local System Account** check box.
  - b. Enter the user name and password for the domain account.
 

Use only supported characters for the user name and password. See [Supported special characters](#).
- **Do not use the Windows domain credentials**

Enter credentials valid for running Automation Anywhere services. Without the valid credentials, the Control Room will fail to launch.
- **PowerShell script restrictions**

Specify a user with permissions to launch PowerShell scripts who is not a Windows domain user. Without the relevant permissions, database table creation can fail.

**15.** Add the SQL Server and click **Next**.

Select **Microsoft SQL Server**, enter the name, and click **Next**.

**16.** On the **InstallShield Wizard Completed** page, click **Finish**.

Launch Automation Anywhere is enabled by default.

Enable **Show installer settings** to open the `aae-installsummary.html` file. By default, this is located at `C:\Program Files\Automation Anywhere\Enterprise\`. Use this file to view a summary of the installation.

The Control Room is opened in your default browser and displays the Configure Control Room settings page.

[Configure Google Cloud Platform settings after installation](#)

## Configure Google Cloud Platform settings after installation

After installing the Control Room, configure the required settings on Google Cloud Platform.

If you have not done so already, complete the installation steps: [Perform custom installation of Control Room on Google Cloud Platform](#).

1. Configure the following Control Room settings:
  - a) Specify the host name URL by providing the Google Cloud Platform load balancer URL. This is the URL that users use to access the Control Room.
  - b) Select the Active Directory authentication type. See [Configure Control Room for Active Directory: manual mode](#).

2. After you configure the Control Room, install product licenses.
3. Test access to the Control Room using the Google Cloud Platform load balancer URL.

Complete the Control Room configuration and validation.

- [Complete Control Room post-installation configuration](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

- [Post-installation user management](#)

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

- [User management](#)

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Installing Control Room on Linux

You start installing the Automation Anywhere Control Room in the Linux environment and complete the installation in the Control Room.

---

**Note:** The installation steps do not list any specific configurations or requirements and therefore your setup might be different. Automation Anywhere does not provide any warranties that the installation steps conform with your system configurations or requirements.

---

This task applies to first-time installation and Automation 360 On-Premises updates.

Ensure the following:

- The Microsoft SQL Server database is installed and running.

- The Automation 360 installation server is connected to the Microsoft SQL Server database.

**1.** Verify the installation prerequisites.

a) Verify the [Automation 360 On-Premises prerequisites](#).

b) Verify the Microsoft SQL Server is running, and execute the command:

```
$ sudo systemctl status mssql-server
```

If Microsoft SQL Server is not running, install it.

---

**Note:** The Microsoft SQL Server installation instructions refer to Red Hat Enterprise Linux version 8. For version 7, change the paths to `/rhel/7` instead of `/rhel/8`.

---

See [Quickstart: Install SQL Server](#).

c) Ensure the following files are available:

- SSL certificate
- License file

d) Download the `AutomationAnywhereEnterprise_A2019_<linux-version>_<build>.bin` installation file to the Linux server from [A-People Downloads page](#) (*Login required*)

e) Verify that the installation server has internet access in order to update Linux kernel files and OS libraries using Yum updates.

Alternatively, configure `/etc/yum.conf` on the installation server to use a repository local to its network. The repository should be up to date before starting the installation.

f) Starting in Automation 360 Build 6463, Python 3.6 is required.

**2.** Log in to the installation server.

**3.** Run the installer command as a superuser from the Linux shell:

a) 

```
$ sudo chmod +x AutomationAnywhereEnterprise_A2019_<linux-version>_<build>.bin
```

b) 

```
$ sudo ./AutomationAnywhereEnterprise_A2019_<linux-version>_<build>.bin
```

The installation wizard verifies the installation requirements and proceeds with the installation.

---

**Tip:**

- Enter the `back` command to return to a previous command step.
- Press the **return key** to accept default values, or enter an alternate value and then press the **return key**.

---

**4.** To accept the license agreement, enter `Y`.

**5.** In the **Transport Layer Security (TLS)** screen, configure the following:

a) Control Room HTTP Port (Default: 80)

b) Control Room HTTPS Port (Default: 443)

c) To enable the Self Signed Certificate, enter `1` or enter `2` to disable it.

d) To Force HTTP Traffic to HTTPS, enter `1` to disable it or enter `2` to enable it.

[Configure application Transport Layer Security](#)

6. In the **Cluster Configuration** screen, enter 1 to disable it or enter 2 to enable it.
  - If you choose to enable cluster configuration, enter the IP addresses of the cluster nodes. Use a comma (,) to specify more than one IP address. Do not add space between IP addresses. For example: 192.161.1.1,192.161.1.2
  - The repository location should be a shared location accessible from all Control Room nodes in the cluster.
  - If multiple local IP addresses are configured on the machine, select the IP address on which the Control Room is installed.

#### *Configure IP cluster*

7. In the **Database Configuration** screen, configure the following:
  - a) Database Server address (default: localhost)
  - b) Database port (default: 1433)
  - c) Control Room Database (default: AAE-Database) or enter a name.
  - d) SQL Server Login credentials: provide the login ID and SQL Server password.

8. Review the pre-installation summary.

9. Press Enter to install Automation 360 in the default directory:

`/opt/automationanywhere/enterprise`

A message appears stating the installation is successfully completed. See [Installed Control Room directories and files](#) for the location of control room assets.

10. Configure the post-installation settings.

#### *Configuring post-installation settings*

Post-installation, a Control Room group `controlroom` is automatically created. Following users are a part of this group which run the respective Control Room services:

`crkernel, traefik, ignite, activemq, crelasticsearch, criqbot, crbotinsight, craari, crdiscoverybot, crstorage.`

11. Verify A2019 services started successfully.

#### *Stop and start Control Room services on Linux*

12. Set up Control Room access.

#### *Configure Control Room database*

13. Set up licenses.

#### *Installing additional licenses*

After the Control Room installation and configuration is complete, users can register their devices to create and run bots.

#### *Install Bot agent and register device*

### **Related tasks**

#### [Performing silent installation of Control Room on Linux](#)

Silent Control Room installation, also known as unattended installation, uses a customized script with parameters specific to your business requirements. The entire installation process runs in the background without requiring user interaction or displaying messages.

#### [Uninstall Automation 360 On-Premises from Linux server](#)

Uninstall the On-Premises Control Room from your Linux server.

### **Related reference**

#### [Installing Control Room On-Premises](#)

Review the installation core tasks and topics for installing the Automation 360 Control Room in a data center on an On-Premises server or a cloud service provider server instance.

### Control Room repository requirements

The repository location is configured in the Control Room after installation. All your automations are stored in this repository.

## Performing silent installation of Control Room on Linux

Silent Control Room installation, also known as unattended installation, uses a customized script with parameters specific to your business requirements. The entire installation process runs in the background without requiring user interaction or displaying messages.

- Verify you have completed the [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - SSL certificate
  - License file
- Verify the installation server has internet access in order to update Linux kernel files and OS libraries using Yum updates. Alternatively, configure `/etc/yum.conf` on the installation server to use a repository local to its network. The repository should be up to date before starting the installation.

Two scripts run the Linux silent installation:

- `LinuxInstaller.sh`: This script contains the installation parameters you want to apply during installation.
- `CallLinuxScript.sh`: This script executes the first script.

See the installation parameters and sample scripts.

Run the script in Linux shell.

1. Review the parameters and identify the settings you require.

Control Room installation parameters		
Installation parameter	Description	Script response options
Proceed with Installation	The installer analyzes your system and notifies you if it does not meet the prerequisites. In silent mode, set the value to 1.	1 = Continue 2 = Cancel
Continue setup wizard	The installer displays an introduction and offers options of <code>back</code> to return to a previous step and <code>quit</code> to cancel the installation.  Default is <code>Enter</code> .	\n
Advance to end of License Agreement	In console mode, you have the option to page through the license agreement. In silent mode, you advance to the end by selecting 0.	0

Control Room installation parameters		
Installation parameter	Description	Script response options
Accept License Agreement	Accept the license agreement to continue with the installation. In silent mode, set the value to Y.	Y = Yes N = No
Control Room HTTP Port	The web server port you will use to access the Control Room with HTTP. The default value is 80.  Replace the number 80 in the sample script to use a different port.	80 = Default port yy = your port number yy
Control Room HTTPS Port	The web server port you will use to access the Control Room with HTTPS. The default value is 443.  Replace the number 443 in the sample script to use a different port.	443 = Default port zzz = your port number zzz
TLS configuration: Self-Signed Certificate	Choose to enable or disable the self-signed certificate. The default is Enable, or 1.	1 = Default (Enable) 2 = Disable
TLS Configuration: Force HTTP traffic to HTTPS	Choose to disable or enable forcing traffic from HTTP to HTTPS. The default is Disable.	1 = Default (Disable) 2 = Enable
Cluster setup	Choose to disable or enable clustering. The default is Disable.	1 = Default (Disable) 2 = Enable
Database server URL	server1.yourcompany.com	Enter the URL of the server where the database resides.
Database server port	Default is 1433	1433
Database name	Default is localhost	Default is localhost. If database is on a separate server, enter the host name.
Database SA user name	Database system administrator login ID	Default is sa.
Database SA user password	Database system administrator login ID	The password to log in to your database as system administrator user.
Database Secure Connection	Choose to disable or enable the connection. Default is Disable (1).	1 = Default (Disable) 2 = Enable

Control Room installation parameters		
Installation parameter	Description	Script response options
Pre-Installation summary	If the output is directed to a console, the installer will show a summary of features selected and whether the prerequisites are met. Default is <code>Enter</code>	<code>\n</code>
Proceed	Confirm to proceed with the installation. Default is <code>Enter</code> .	<code>\n</code>

2. Create the script `LinuxInstaller.sh`, substituting values for your own environment.



**Warning:** Be sure to test the connection to the SQL Server and enter verified values for database name, database administrator login ID, database administrator password. Invalid values cause the script to stall and fail.

Example script:

```
echo "Starting Installation"
#Change the next two lines to match the install filename you downloaded
sudo chmod a+x AutomationAnywhereEnterprise_A2019_e17_4799.bin
sudo ./AutomationAnywhereEnterprise_A2019_e17_4799.bin << EOF
1
\n
0
Y
80
443
1
1
1
#Change the next line to your Automation Anywhere install server
mybotserver.mycompany.com
1433
#Replace next line with your database name
AAE-Database
#Change the next two lines to your SQL Server admin ID and password
admin
youradminpasswordhere
1
\n
\n
\n
EOF
```

3. Create the script `CallLinuxscript.sh` to execute `Linuxinstaller.sh`.

This script writes the installation results to `/home/Installlog`. Change the path to the install log file, if required.

```
echo "Starting Linux installation"
sudo ./LinuxInstaller.sh >> /home/Installlog
echo "Installation Completed Successfully"
```

4. On the installation server, logged in as an Administrator, execute the scripts.
  - a) `$ sudo chmod a+x LinuxInstaller.sh`
  - b) `$ sudo chmod a+x CallLinuxscript.sh`
  - c) `$ sudo ./CallLinuxscript.sh`

5. Review the installation log to confirm there were no errors.

---

**Note:** The Control Room installation folder on Linux is located by default at `/opt/automationanywhere/enterprise`.

---

Continue from the step **Configure the post-installation settings** in [Installing Control Room on Linux](#).

## Uninstall Automation 360 On-Premises from Linux server

Uninstall the On-Premises Control Room from your Linux server.

Ensure that the Automation 360 installation server is disconnected from the Microsoft SQL Server database.

1. Log in to the installation server.
2. Run the uninstaller command as a superuser:

```
$ sudo /opt/automationanywhere/enterprise/_Automation\ Anywhere\
Enterprise_installation/Change\ Automation\ Anywhere\ Enterprise\
Installation
```

The installation wizard verifies the installation and proceeds with the uninstallation.

---

### Tip:

- Enter the `back` command to return to a previous command step.
- Press the **return key** to accept default values, or enter an alternate value then press the **return key**.

3. Confirm the uninstallation by entering `Y`.

The Automation 360 components are removed from the Linux system.

The databases with associated Automation 360 information about users and bots remains stored in the database and remain connected to any other Control Room in your cluster.

## Performing silent uninstallation of Control Room on Linux

Use the sample script to perform an unattended uninstallation of Control Room.

Ensure that the Automation 360 installation server is disconnected from the Microsoft SQL Server database.

1. Log in to the installation server.
2. Create a shell script named `LinuxUninstall.sh` that will run the uninstallation process and automatically respond to prompts:

```
sudo /opt/automationanywhere/enterprise/_Automation\ Anywhere\
Enterprise_installation/Change\ Automation\ Anywhere\ Enterprise\
Installation << EOF
```

```
\n
1
\n
EOF
```

**3.** Mark the script as executable and run the uninstallation process.

a) `$ sudo chmod a+x LinuxUninstall.sh`

b) `$ sudo ./LinuxUninstall.sh`

The script is executed:

```
=====
Automation Anywhere Enterprise                               (created with
  InstallAnywhere)
-----
Preparing CONSOLE Mode Uninstallation...
=====
Uninstall Automation Anywhere Enterprise
-----
About to uninstall...
```

**4.** When the uninstallation is complete, manually remove any remaining files.

## Installing Control Room on Microsoft Windows Server using scripts

Silent Control Room installation, also known as unattended installation, uses a customized script for a full setup or the command line for a hot fix patch. Silent install runs the entire installation process in the background without requiring user interaction or displaying messages.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task.

- Verify [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file
- Create a Powershell script.
 

See the installation parameters and sample scripts.
- Run the script in Powershell.

**1.** Review the parameters and identify the settings you require.

- **Control Room installation parameters**

Variable name	Description
AA_CRCLUSTERCONFIG	if AA_SETCLUSTERMODE=1 then cluster IP comma separated
AA_CRDBPORT	Control Room database port. Default value is 1433

Variable name	Description
AA_CRDBSSLMODE	Secure SQL connection
AA_CRFORCEHTTPSCONFIG=" "	--
AA_CRFORCETOHTTPS="1"	Force traffic from HTTP to HTTPS
AA_CRHTTPPORT	Control Room HTTP port. Default is 5432
AA_CRHTTPSPORT	Control Room HTTPS port
AA_CRLISTENPORT	Web server port. Default value is 80
AA_CRSERVICECONFIRMPASSWD	If AA_CRSETLOCALSERVICECRED= 0, then confirm password
AA_CRSERVICEPASSWD	If AA_CRSETLOCALSERVICECRED= 0, then confirm password
AA_CRSERVICEUSERNAME	if AA_CRSETLOCALSERVICECRED= 0, then add domain\user name
AA_CRSETLOCALSERVICECRED	<ul style="list-style-type: none"> <li>• 1 if service logon as System</li> <li>• 0 if service logon as specific user</li> </ul>
AA_CRWCCERTPASSWD	Certificate password
AA_CRSELFSIGNCERT	1 for self-signed certificate
AA_CRWCCERTPATH	Certificate path
AA_SDSFEATURE	<ul style="list-style-type: none"> <li>• true=Cloud deployment type</li> <li>• false=On-Premises deployment type</li> </ul>
AA_SETCLUSTERMODE	For cluster set 1, otherwise 0
AA_SETUPTYPE	Setup type Custom or Express
INSTALLDIR	Installation Directory
IS_SQLSERVER_AUTHENTICATION	0 for Windows authentication
IS_SQLSERVER_DATABASE	SQL database name

Variable name	Description
IS_SQLSERVER_SERVER	SQL server name (host name)

- **Elasticsearch related parameters**

Parameter	Description
AA_ELASTICSEARCH_BACKUP	Used only if installing on the first node of a backup server. Enter 1 if yes.  <b>Note:</b> The AA_ELASTICSEARCH_BACKUP parameter is used when you install an Control Room as backup server for audit.
AA_ELASTICSEARCHSYSIP	Valid IP address
AA_ESPASSWD	Password for Elasticsearch  <b>Note:</b> An additional parameter for confirming the password is not available. The password must have a minimum of 6 characters.

2. Optional: Edit the sample script to use a Microsoft SQL Server database.

Use the script to install the Control Room with the configuration options available in the installer.

- Correct values for variables such as `$service_username`, `$service_pwd`, `$db_server`, `$scr_port`.
- Run the script with Credentials in Service logon, and a non-secure connection using Microsoft SQL Server authentication with a new database.

Sample script:

```
$scr_port=80

$service_username= "domain\username" #e.g."aaspl-brd\ellie.brown"
$service_pwd="password"

#$certpath = "C:\SilentInstall\test256.pfx"
#$certpass = "changeit"

$db_server="localhost"
$scr_db_name="CRDB-NEW-SI-3"
$db_user="sa"
$db_pwd="Admin@123"

$elastic_password="Test@123"

$installation_path="C:\Program Files\Automation Anywhere"

#Install latest setup
$static_installation_path="\Enterprise\""
$silent_details=" /s ", "v"" -join "/"
```

```

$installpath_details=" /qn INSTALLDIR=\"\"
$deployment_details=" /AA_SDSFEATURE=true"
$custom_details=" /vAA_SETUPTYPE=Custom
                 /vAA_CUSTOMMODETYPE=1"
$port_cluster_details=" /vAA_SETCLUSTERMODE=0
                      /vAA_CRLISTENPORT=$cr_port"
#$service_details=" /vAA_CRSETLOCALSERVICECRED=0
                  /vAA_CRSERVICEUSERNAME=$service_username
                  /vAA_CRSERVICEPASSWORD=$service_pwd
                  /vAA_CRSERVICECONFIRMPASSWORD=$service_pwd"
$service_details=" /vAA_CRSETLOCALSERVICECRED=1"
#$db_details=" /vAA_BIMETADATADBTYPE=AA_BIMETADATADBTYPE
             /vIS_SQLSERVER_SERVER=$db_server
             /vIS_SQLSERVER_DATABASE=$cr_db_name
             /vIS_SQLSERVER_DATABASE1=$bi_db_name"
$db_details=" /vIS_SQLSERVER_SERVER=$db_server
            /vIS_SQLSERVER_USERNAME=$db_user
            /vIS_SQLSERVER_PASSWORD=$db_pwd
            /vIS_SQLSERVER_DATABASE=$cr_db_name
            /vIS_SQLSERVER_AUTHENTICATION=1"
$other=" /vAA_ESPASSWORD=$elastic_password
       /vAA_CRWCHTTPPORT=80
       /vAA_CRWCHTTPSPORT=443
       /vAA_CRSELFSIGNCERT=1
       /vAA_OPTIONALCACERT=0
       /vAA_CRWCCERTPATH=$certpath
       /vAA_CRWCCERTPASSWORD=$certpass
       /vLAUNCHPROGRAM=1
       /v""
       /LIweamoruc! log.txt""

$final_commandline = -join($silent_details,
    $installpath_details,$installation_path,
    $static_installation_path,$custom_details,
    $port_cluster_details,$service_details,
    $db_details,$pg_details,$other)

Write-Host $final_commandline
$a=Get-ChildItem $PSScriptRoot\* -Include *.exe
#$a = "C:\Silent\AutomationAnywhereEnterprise_A2019_<build>.exe"

Write-Host $a
Write-Host "Starting the installation wait for sometime..."

$processdetail=(Start-Process -FilePath
    $a -ArgumentList $final_commandline
    -Wait -PassThru).ExitCode

Write-Host $a.Name execution is done.
If installation is not proper check msi logs in the temp folder.
pause

```

3. Save the script you edit to the server for installation.
4. On the installation server, log on as an administrator, open Powershell in admin mode, and execute the following: `Set-ExecutionPolicy Unrestricted -Scope CurrentUser -Force`

**5.** Start Powershell in admin mode and execute: `.\install.ps1`

---

**Note:** The silent installation logs are stored in the folder from which the installation script is executed. For example, if you run the script from `C:\Silent Install`, the logs are stored in `C:\Silent Install` folder.

---

Complete the Control Room configuration and validation.

- After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.
- After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.
- As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

**Related concepts**[Post-installation user management](#)

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

**Related tasks**[Complete Control Room post-installation configuration](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

[Performing silent installation of Control Room on Linux](#)

Silent Control Room installation, also known as unattended installation, uses a customized script with parameters specific to your business requirements. The entire installation process runs in the background without requiring user interaction or displaying messages.

**Related reference**[User management](#)

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

## Complete Control Room post-installation configuration

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

**1.** [Configure post-installation settings](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

**2.** [Verify Automation Anywhere services](#)

Automation Anywhere specific services are installed on the Control Room server.

**3.** [Configure Control Room for HTTPS certificate](#)

Configure Control Room for HTTPS mode using a self-signed or CA certificate either before or after performing a custom Control Room configuration.

**4. *Import HTTPS and CA certificates***

After installing the Control Room, import a certificate for HTTPS, Certificate Authority (CA), or both using the Windows or Linux command prompt.

**5. *Configure disaster recovery site for Elasticsearch IP addresses***

If you have configured the Control Room for high availability (HA) and disaster recovery (DR) and installed the Control Room on both the primary and secondary sites, configure Elasticsearch IP addresses for the secondary site.

## Configuring post-installation settings

After you finish installing the Control Room, configure specific items to ensure timely Automation Anywhere communications.

### Post-installation tasks and settings

#### **Exclude anti-virus**

Exclude anti-virus scans from running in the Automation Anywhere local repository because they interfere with running bots.

#### **Set the language locale**

Select your language as the region setting.

The following example uses English (United States) as the region setting.

- **Windows:** Select **Control Panel > Region > Administrative > Change system locale**.

For usernames that contain non-ASCII characters, update the following settings:

1. From **Control Panel > Clock and Region > Administrative > Change system locale**, select the required language from the **Current system locale** list.
2. If available, clear the **Beta: Use Unicode UTF-8 for worldwide language support** check box.
3. To change the code page identifier, enter `chcp <identifier-code>` at the command prompt. For example, enter `chcp 949` to use ANSI or OEM Korean (Unified Hangul Code).

*Code Page Identifiers*

4. Restart your machine.

- **Linux**

1. Verify the current locale:

```
$ locale
```

2. Display a list of all available locales on the server:

```
$ locale -a
```

3. Depending on your operating system, use one of these options to set the locale for the whole server with the LANG variable.

Substitute language `en_US.UTF-8` with your own:

**Ubuntu:** `sudo update-locale  
LANG=en_US.UTF-8 LANGUAGE`

**Red Hat Enterprise Linux:** `sudo  
localectl set-locale  
LANG=en_US.UTF-8`

4. Update either the global locale settings file `etc/locale.conf` or settings `~/ .bash_profile` for the user that owns Automation 360:

```
LANG="en_US.utf8"
```

```
export LANG
```

### Set the region

Select your language as the region format.

**Windows:** Select **Control Panel > Region > Format**.

### Set time synchronization

Enable Network Time Protocol (NTP) on the Control Room.

For additional information about setting the NTP, contact your system administrator.

### For Microsoft Azure platform installation, set configuration

Use the Microsoft Azure Portal to configure:

- Windows credentials
- Control Room settings for repository, URL, and master key for Credential Vault
- Microsoft Active Directory authentication
- Optionally, SMTP settings

### Related tasks

[Complete Control Room post-installation configuration](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

### Related reference

[Verifying Automation Anywhere services](#)

Automation Anywhere specific services are installed on the Control Room server.

### [Working with SQL Servers](#)

Configure Microsoft SQL Servers before setting up the Control Room database.

## Verifying Automation Anywhere services

Automation Anywhere specific services are installed on the Control Room server.

---

**Linux users:** See [Stop and start Control Room services on Linux](#).

---

### Verify installed Windows services

From your Windows device:

1. Select **Control Panel > Administrator Tools > Services**.

The specific path to **Services** can vary, depending on your specific Windows version.

2. Scroll through the list to find the listed service name. Note the **Status** should show as running.

### Control Room installed services

Verify that the following Windows services are installed by the Automation Anywhere Control Room installer.

Service name	Description
Automation Anywhere Bot Compiler Service	Stores all details about the bot compile service. Receives and processes Bot compilation requests for the Control Room.
Automation Anywhere Control Room Caching	Used for distributed cache storage.
Automation Anywhere Control Room IQ Bot Service	Used for Automation 360 IQ Bot.
Automation Anywhere Control Room Messaging	Allows Control Room services to communicate asynchronously.
Automation Anywhere Control Room Reverse Proxy	Receives all incoming HTTP and HTTPS requests for Automation Anywhere products and forwards to the correct service.
Automation Anywhere Control Room Robotic Interface Service	Is the Automation Anywhere Robotic Interface service used to create and orchestrate workflows between forms and bots.
Automation Anywhere Control Room Service	Receives and processes API requests for the Control Room.
Automation Anywhere Elastic Search Service	Stores all logs and related activities for search functionality. For details about Elasticsearch, see <a href="#">Elastic Stack and Product Documentation</a> .
Automation Anywhere Control Room Discovery Bot Service	Used for Discovery Bot.

Service name	Description
Automation Anywhere Control Room Discovery Bot ML Service	Used to launch Discovery Bot from Control Room.
Automation Anywhere Control Room Storage Service	Used as a storage solution to leverage automation projects.

- All the services can be configured either in the Local System or Domain account when the Control Room is installed in Custom mode. For a Control Room installed in Express mode, all the services are run in the Local System account.
- By default, the Automation Anywhere services restart automatically after a system reboot.

### Related concepts

#### [Installing Control Room using Custom mode](#)

Log in to the server as an administrator and install Automation Anywhere Control Room in Custom mode to select installation and configuration options, including installing non-default requirements. Select this mode for a data center deployment.

### Related tasks

#### [Installing Control Room using Express mode](#)

#### [Installing Control Room on Linux](#)

You start installing the Automation Anywhere Control Room in the Linux environment and complete the installation in the Control Room.

## Configure Control Room for HTTPS certificate

Configure Control Room for HTTPS mode using a self-signed or CA certificate either before or after performing a custom Control Room configuration.

Transportation Layer Security is configured as part of the Control Room installation. If that step was skipped or the certificate expires, configure the TLS certificate with this post-installation configuration.

---

**Important:** It is not recommended to use self-signed certificates. However, if you use a self-signed certificate, ensure you install the certificate on each device manually and accept the certificate to enable communication between the device and the Control Room after configuring the self-signed certificate.

---

1. Log in to the Control Room.  
The Control Room instance launches in your default browser.
2. Change the Control Room URL setting and port to `HTTPS` and port number to `443`.  
The **Website Security Warning** page is displayed.
3. Continue to the Control Room website to access the Control Room.

#### [Configure Control Room authentication options](#)

If you have already configured it, then log in to the Control Room.

### Related tasks

#### [Import HTTPS and CA certificates](#)

After installing the Control Room, import a certificate for HTTPS, Certificate Authority (CA), or both using the Windows or Linux command prompt.

#### [Configure application Transport Layer Security](#)

Use the **Transport Layer Security (TLS) configuration** wizard page from the Automation 360 installer to generate a self-signed certificate or import a security certificate to set up a highly secure Control Room instance.

## Import HTTPS and CA certificates

After installing the Control Room, import a certificate for HTTPS, Certificate Authority (CA), or both using the Windows or Linux command prompt.

You can import HTTPS and CA certificates in the following scenarios:

- When you switch the Control Room from HTTP to HTTPS after Automation 360 is installed.
- The certificates expire or need modification, for example, when you add a new server.

These instructions apply to both Windows and Linux installations.

To import a CA or HTTPS certificate for configuring the Control Room for secure connection using the command prompt, perform the following steps:

**1.** Run the command prompt in administrator mode.

**2.** Navigate to the Automation Anywhere installation path.

The default installation path for Windows is C:\Program Files\Automation Anywhere\Automation360.

The default installation path for Linux is /opt/automationanywhere/enterprise

**3.** Enter or paste the following at the command prompt:

- For Windows HTTPS certificate, enter the command:

```
jdk11\bin\java -jar certmgr.jar -appDir "C:\Program Files\Automation Anywhere\Automation360" -setServerCert "C:\Users\craadmin\Desktop\test_automationanywhere_com.pfx" -privateKeyPass <PFX Password>
```

- For Linux CentOS HTTPS certificate, enter the command:

```
jdk11/bin/java -jar certmgr.jar -appDir "/opt/automationanywhere/enterprise" -setServerCert "/home/<user>/test_automationanywhere_com.pfx" -privateKeyPass <PFX Password>
```

- For Windows CA certificate, enter the command:

```
jdk11\bin\java -jar certmgr.jar -appDir "C:\Program Files\Automation Anywhere\Automation360" -importTrustCert "D:\<user name>\My Downloads\CA31.cer"
```

- For Linux CentOS CA certificate, enter the command:

```
jdk11/bin/java -jar certmgr.jar -appDir "/opt/automationanywhere/enterprise" -importTrustCert "CA31.cer"
```

4. During the installation, if you did not accept the default and indicated you want to upload your own (self-signed) certificate, add the following parameters to the `boot.db.properties` file that is located in the `config` folder, in the Automation Anywhere installation path.

- Windows file location:

```
root:\Program Files\Automation Anywhere\Automation360\config
\boot.db.properties
```

- Linux file location:

```
/opt/automationanywhere/enterprise/config/boot.db.properties
```

Parameter:

```
trustServerCertificate=false
```

## Configure disaster recovery site for Elasticsearch IP addresses

If you have configured the Control Room for high availability (HA) and disaster recovery (DR) and installed the Control Room on both the primary and secondary sites, configure Elasticsearch IP addresses for the secondary site.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Complete the Control Room installation on both the primary and secondary DR sites.

Before adding a new node, ensure the existing cluster is in yellow or green state and all ports on the new node are open.

Perform this task to make the IP address of the secondary DR site Elasticsearch available to the primary DR site.

1. From the primary site Control Room, navigate to **Administration > Settings > General > Control Room Database & Software**.
2. Click **Edit**.
3. Enter the DR secondary site **Cluster IP address** in the **Elasticsearch disaster recovery backup cluster** field.
4. Click the plus sign to add additional cluster IP addresses.
5. Click **Save Changes**.

### Related concepts

[High availability and disaster recovery deployments](#)

High availability (HA) provides a failover solution if a Control Room service, server, or database fails.

Disaster recovery (DR) provides a recovery solution across a geographically separated distance in the event of a disaster that causes an entire data center to fail.

### Related tasks

[Perform disaster recovery failover](#)

Perform the required failover steps for Automation 360 recovery at the physically remote secondary site after a disaster at the primary site.

## Add primary IP address for cluster

If your Control Room server has multiple IP addresses or network interface cards (NICs), you can manually update the `cluster.properties` file to include the primary IP address.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task.

- Ensure you have the view and manage settings permission.
- Complete the Control Room installation.
- Updating the `cluster.properties` file requires a downtime, so ensure a maintenance window for the following:
  - All the user devices will be disconnected.
  - No schedules will run during maintenance.
  - Bot agent and Automation Anywhere Control Room will not be accessible.

Update the `cluster.properties` file to ensure the caching service requirement to define a single IP address for the primary NIC of the Control Room.

Complete this task on all the Control Room nodes in a high availability cluster.

1. Locate the `cluster.properties` file in your Control Room directory.  
For example, the default location is: `C:\Program Files\Automation Anywhere\Enterprise\config\`

If the file does not exist in your Control Room directory, create the file.

2. Add the following property option to the `cluster.properties` file:  
`ignite.local.static.ip=<nic_ip_address>`  
For example, `ignite.local.static.ip=172.16.20.168`

---

**Note:** The `ignite.local.static.ip` property is configured with a single IP address of the primary NIC of the Control Room node. You can manually reconfigure the property when more than one IP address is available.

---

3. Save the `cluster.properties` file.
4. Restart the following Automation Anywhere Windows services:
  - a) Automation Anywhere Control Room Caching
  - b) Automation Anywhere Control Room Messaging
  - c) Automation Anywhere Control Room Service
5. To ensure all the cache is in sync, restart the rest of the Automation Anywhere Windows services.

## Configure additional IP address for a new cluster node

After installing the Control Room in the cluster node, if you add new nodes in the cluster, you have to configure additional static IP addresses for all the nodes in the property file on each node in the cluster.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task.

- Ensure that you have a maintenance window, which requires complete downtime for the following:
  - All the user devices will be disconnected.
  - No schedules will run during maintenance.
  - Bot agent and Automation Anywhere Control Room will not be accessible.
- Complete the Control Room installation on any new node.

Perform the following steps on each node in the cluster:

**1.** Stop the following Automation Anywhere services on the Control Room node:

- a) Automation Anywhere Control Room Reverse Proxy
- b) Automation Anywhere Control Room Caching
- c) Automation Anywhere Control Room Service
- d) Automation Anywhere Elastic Search Service
- e) Automation Anywhere Bot Insight Elastic Search
- f) Automation Anywhere Control Room IQ Bot Service
- g) Automation Anywhere Control Room Robotic Interface Service
- h) Automation Anywhere Control Room Discovery Bot Service

**2.** Locate the `cluster.properties` file in your Control Room directory.

For example, the default location is: `C:\Program Files\Automation Anywhere\Enterprise\config\`

If the file does not exist in your Control Room directory, create the file.

**3.** Add the following properties and configure the primary IP addresses as a static IP address for all the cluster nodes (including existing cluster nodes) in the `cluster.properties` file.

```
ignite.discovery.mode=static
ignite.discovery.static.ips=<primary ip addresses>
```

For example: `ignite.discovery.static.ips=10.0.11.153,10.0.11.13`

**4.** If the nodes have multiple IP addresses, also add the following property and configure a specific primary IP address on each node in the cluster:

```
ignite.local.static.ip=<primary ip address>
```

For example: `ignite.local.static.ip=10.0.11.153`

**5.** Save the `cluster.properties` file.

6. Modify the `elasticsearch.yml` file for the new IP address:
  - a) Locate the `elasticsearch.yml` file in the Control Room directory.  
For example, the default location is: `C:\Program Files\Automation Anywhere\Enterprise\elasticsearch\config\elasticsearch.yml`
  - b) Update `elasticsearch.yml` with the new IP address using the following property:  
`discovery.zen.ping.unicast.hosts: ["ip1", "ip2", "ip-new"]`
  - c) Save the `elasticsearch.yml` file.
7. Start all the services that were stopped in Step 1 on each Control Room node.

---

**Note:** Wait for an interval of 40 seconds before starting the next service.

---

## Add Automation 360 On-Premises DNS to trusted list

To ensure secure access to Automation 360 online services for On-Premises deployment, add specific Automation Anywhere Domain Name System (DNS) to the safe recipients or trusted list on each user device.

Automation 360 online service hosting uses dynamic IP addresses and therefore we recommend that you add to the safe recipients or trusted list the complete DNS instead of an IP address for the Automation Anywhere online services.

---

**Note:** The list can vary based on the end-user environment for On-Premises deployments.

---

Service	DNS	Port
Automation Anywhere	<code>www.automationanywhere.com</code>	TCP 443 (HTTPS)
Automation Anywhere community (A-People)	<code>apeople.automationanywhere.com</code>	TCP 443 (HTTPS)
Automation Anywhere documentation	<code>docs.automationanywhere.com</code>	TCP 443 (HTTPS)
Bot Store	<code>botstore.automationanywhere.com</code>	TCP 443 (HTTPS)
Telemetry Allows performance and usage information to be gathered anonymously in order to improve product quality.	<ul style="list-style-type: none"> <li>• <code>cdn.whatfix.com</code></li> <li>• <code>cdn.heapanalytics.com</code></li> <li>• <code>heapanalytics.com</code></li> </ul>	TCP 443 (HTTPS)
Automation Anywhere Google Chrome extension Enables you to automate using the Google Chrome browser.	<code>https://chrome.google.com/webstore/detail/automation-360/kammdlphdfejlopponbapgpbgakimokm</code>	TCP 443 (HTTPS)
Automation Anywhere Microsoft Edge extension Enables you to automate using the Microsoft Edge browser.	<code>https://microsoftedge.microsoft.com/addons/detail/automation-360/dbmodiepejcigljbmeebdkmegndokbk</code>	TCP 443 (HTTPS)

Service	DNS	Port
Automation Anywhere Mozilla Firefox extension Enables you to automate using Mozilla Firefox browser.	<a href="https://addons.mozilla.org/en-US/firefox/addon/automation-360">https://addons.mozilla.org/en-US/firefox/addon/automation-360</a>	TCP 443 (HTTPS)

## Uninstalling Automation 360

Use the Automation 360 installer or the **Uninstall or change a program** option from the Windows Control Panel to remove or uninstall an Control Room instance.

1. To uninstall the Control Room using the installer, run the setup file from the installation path.  
Run the installer in admin mode.
2. In the InstallShield wizard, click **Next**.
3. Click **Remove**.
4. Click **Finish** to complete uninstalling the Control Room from your machine or server.

### Related concepts

[Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

### Related reference

[Installing Control Room On-Premises](#)

Review the installation core tasks and topics for installing the Automation 360 Control Room in a data center on an On-Premises server or a cloud service provider server instance.

## Installing Control Room for Cloud-enabled deployment

With Cloud-enabled deployment, you can store and process native business and operational data on site and take advantage of management and operational services delivered from Automation Anywhere Cloud.

Automation Anywhere deploys and provisions an Automation 360 Cloud-enabled service instance in our cloud to deliver management and operational capabilities. Customer then installs the Cloud-enabled application within their infrastructure to consume these capabilities for storing and processing customer data.

---

**Note:** Linux is not supported for Cloud-enabled deployments.

---

For Cloud-enabled deployment, the initial welcome email that you received from Automation Anywhere contains:

- URL to the Automation Anywhere Cloud-enabled instance
- Provisioning token needed to establish trust connectivity with the Automation Anywhere Cloud Control Room

---

**Important:** Do not discard the content of this email. You will need the information in the email to setup on-premises application.

---

1. Receive your Automation 360 Cloud-enabled service URL from Automation Anywhere and provisioning token.
2. Install and access the On-Premises application.  
Download and install the Cloud-enabled application on your network; the installation user is assigned administrator privileges.  
*Installing Control Room On-Premises*
3. Log in to the On-Premises Control Room.  
*Log in to Automation Anywhere Control Room*
4. Navigate to **Administration > Settings > Cloud-Enabled**.
5. Provide the provisioning token to connect to the Control Room.
6. Click **Save changes**.  
The trusted relationship between the instances is created.
7. To test Cloud-Enabled functionality, open a browser, enter the URL of the Cloud Control Room service instance, and press Enter.  
You are redirected to the On-Premises Control Room.

### Related concepts

#### [Post-installation user management](#)

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

### Related tasks

#### [Install Bot agent and register device](#)

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

### Related reference

#### [Installed Control Room directories and files](#)

When installing the Automation Anywhere Control Room on different operating systems, the installer executes and installs files and folders in the following directories.

## Post-installation user management

After completing the post-installation tasks, validate the setup by logging in to the Control Room and installing a license. First time access to the Control Room walks you through the configuration for your authentication method.

#### *Configure Control Room authentication options*

The options for launching the Control Room for the first time and the authentication method depend on the installation mode and deployment type.

### Validate services

Validate that the following services are running in automatic mode:

- Automation Anywhere Control Room Caching
- Automation Anywhere Control Room Messaging
- Automation Anywhere Control Room Reverse Proxy

- Automation Anywhere Control Room Service
- Automation Anywhere Elastic Search Service
- Automation Anywhere Bot Compiler Service
- Automation Anywhere Control Room IQ Bot Service
- Automation Anywhere Control Room Robotic Interface Service
- Automation Anywhere Control Room Discovery Bot Service
- Automation Anywhere Control Room Discovery Bot ML Service
- Automation Anywhere Control Room Storage Service

### *User management*

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

### **Related tasks**

#### [Complete Control Room post-installation configuration](#)

After installing the Control Room, complete the configuration settings to ensure timely Automation Anywhere communications are specified and confirm Automation Anywhere services are running.

## Configure Control Room authentication options

The options for launching the Control Room for the first time and the authentication method depend on the installation mode and deployment type.

The authentication options for Control Room in Cloud and Cloud-enabled deployments differ from the options for On-Premises deployment (installed using the Custom mode).

After the installation (Custom mode) is complete, configure the Control Room in Custom mode to authenticate users with an Active Directory (AD), Control Room database, or single sign-on (SSO).

---

**Note:** The Active Directory authentication mode is available for On-Premises deployment and not for Cloud and Cloud-enabled deployments.

---

Based on your installation mode (express or custom) and deployment type (On-Premises, Cloud, and Cloud-enabled), select any of the following authentication methods for the Control Room:

- After an Express mode installation, configure the Control Room in Express mode using the default settings.

#### *[Configure Control Room in Express mode](#)*

- Authenticate users using Active Directory by manually adding the LDAP URLs.

#### *[Configure Control Room for Active Directory: manual mode](#)*

- Authenticate users using Active Directory by enabling the Control Room to discover and list domains and sites in your organization.

#### *[Configure Control Room for Active Directory: auto mode](#)*

- Authenticate users using the database option.

*Configure Control Room database*

- Configure Control Room for HTTPS mode using a self-signed certificate either before or after a custom Control Room configuration.

*Configure Control Room for HTTPS certificate*

- Configure an authenticated environment Control Room database to a SAML identity provider (IDP).

*Set up SAML authentication*

## Configure Control Room in Express mode

After completing the installation in Express Mode, configure the Control Room in Express Mode using the default settings.

To configure Control Room when you start it for the first time, do the following steps:

1. Open Control Room in a browser to launch the **Getting Started** wizard.
  - **Windows:** Double-click the Automation Anywhere Control Room icon on the desktop.
  - **Linux:** Open a browser and navigate to the Linux server hostname. Example:  
`server1.mycompany.com`
2. Fill in the following fields:
  - **Username:** Enter a user name.
  - **First name** Enter the first name.
  - **Last name** Enter the last name.
  - **Email** Enter an email address.
  - **Password** Enter a password.
  - **Confirm password** Confirm the password.
3. Click **Next**.  
The **Create security questions** page appears.
4. Enter three security questions and answers.
5. Click **Next**.  
The **Credential settings** page appears.
6. Select from the following options:
  - **Express mode:** The system stores your master key to connect to the Credential Vault. This option is not recommended for a production environment.
  - **Manual mode:** You store the Master Key on your own, and then provide the Master Key when the Credential Vault is locked. Users use the Master Key to connect to the Credential Vault to secure their credentials and access them when creating and running TaskBots.




---

**Warning:** If you lose the key, you will not be able to access the Control Room.

---

7. Click **Save and log in**.

You are logged in to the Control Room as an administrator. You can now configure and manage the overall RPA environment with Control Room and clients.

After configuring the Control Room, install product licenses.

## Configure Control Room for Active Directory: manual mode

Configure the Control Room to authenticate users using Active Directory by manually adding the Lightweight Directory Access Protocol (LDAP) URLs.

To configure the Control Room when you start it for the first time, do the following:

1. Double-click the Automation Anywhere Control Room icon on your desktop.  
The **Configure Control Room settings** page appears.
2. Type the repository path.  
This is the location where the uploaded automation files, for example, IQ Bots, and TaskBots are stored. For example, `C:\ProgramData\AutomationAnywhere\Server Files`.
3. Enter the access URL.  
This is the URL for accessing your installation of Control Room.
4. Click **Save and continue**.



**Warning:** The **back** button of your web browser is automatically disabled after you click **Save and continue**. This ensures that the Credential Vault Master Key that generates matches the repository path and Control Room access URL.

To return to the **Configure Control Room settings** page, press `Ctrl plus F5` and restart.

---

The **Credential Vault settings** page appears.

5. Select from the following options:
  - **Express mode:** The system stores your master key to connect to the Credential Vault. This option is not recommended for a production environment.
  - **Manual mode:** You store the Master Key on your own, and then provide the Master Key when the Credential Vault is locked. Users use the Master Key to connect to the Credential Vault to secure their credentials and access them when creating and running TaskBots.



**Warning:** If you lose the key, you will not be able to access the Control Room.

---

6. Click **Save and continue**.



**Warning:** The **back** button of the web browser is automatically disabled after you click **Save and continue**. No further changes to the Control Room configuration or Credential Vault settings are allowed.

To make changes, reinstall the Control Room.

---

The **Authentication type for Control Room users** page appears.

**7. Select Active Directory.**

Automation Anywhere supports Active Directory Multi-Forest authentication for the Control Room. Before providing the Authentication Type, ensure the following:

- One-way or two-way trust is set up between all forests. For a one-way trust, this is from the Enterprise client forest to the Control Room forest (Control Room forest must always be the trusting forest).
- Two-way trust is set up for every domain in a forest.
- The root certificate of the LDAP server is imported using the provided CertMgr tool via command.
- The provided LDAP URLs per forest cannot be behind a load balancer. Also, all LDAP URLs must point to the root (main) domain controllers.
- The node that runs the Control Room is in the same domain network where the Active Directory runs.
- The user is in the parent domain and the URL points to the parent.

This ensures that when there are two or more forests, and one of the forest has a subdomain with a different name space, a user from the other forests does not have permission to access that subdomain.

**8. Type the Global Catalog URL.**

For example, `ldap://server01.domain.com`.

For failsafe authentication, click the plus option to provide additional LDAP URLs.

---

**Note:** For users and groups from one or more Active Directory domains, to access the Control Room, use a fully qualified host name of the Global Catalog (GC) server, listening on port 3268 (3269 if SSL).

---

When adding LDAP URLs, ensure that you provide a fully qualified host name like `ldap://server01.ldap.com`.

Provide URLs of multiple Global Catalogs per forest so that if one Global Catalog in a forest goes down, the other can serve. This feature does not provide support for the load-balanced URL.

You must enter the Domain username and password and click **Manually add connections** to enter the LDAP URLs.

**9. Provide service account credentials**

Ensure that the username provided is a user in the Domain Users group and ideally and be set up in Active Directory with a **password never expires** option. If otherwise, there will be some downtime in RPA authentication as the service account password is reset. Provide the username in a User Principal Name (UPN) in the `username@domain.com` format and password.

**10. Click Check connection.**

If Control Room is unable to connect to the Active Directory database, an error message appears.

**11. Click Next.**

The **Control Room first administrator** page appears.

**12. Select the Active Directory domain from the drop-down list and type the Control Room administrator username.****13. Click Check name in Active Directory.**

If the username is in the Active Directory the following user details are shown:

- **First name**
- **Last name**
- **Email**

You can edit these prepopulated fields.

**14. Click Save and log in.**

You are logged in to the Control Room as an administrator. You can now configure and manage the overall RPA environment with Control Room and clients.

After configuring the Control Room, install product licenses.

**Related tasks**[Configure Control Room for Active Directory: auto mode](#)

Configure the Control Room to authenticate users using Active Directory by enabling the Control Room to discover and list domains and sites in your organization.

## Configure LDAP channel binding

Configure LDAP channel binding in Automation 360 On-Premises for enhanced security in network communications between an Active Directory and its clients. This method provides a more secure LDAP authentication over SSL and TLS.

Enable channel binding in the `um.properties` file when required.

1. Go to the Control Room installation path.
2. From the list of files in the `config` folder, open the `um.properties` file with an XML editor.
3. Add the `um.ldap.channel.binding.enabled` property in the `um.properties` file.  
For example, `um.ldap.channel.binding.enabled=false`
4. To enable channel binding, change the value to `true`.  
The default value is `false` and channel binding is disabled.  
Channel binding is enabled if it is enabled on the server side.

For information about enabling channel binding on the server side, see [LDAP enforce channel binding registry entry](#).

5. Save the file.

## Configure Control Room for Active Directory: auto mode

Configure the Control Room to authenticate users using Active Directory by enabling the Control Room to discover and list domains and sites in your organization.

To configure the Control Room when you start it for the first time, do the following:

1. Double-click the Automation Anywhere Control Room icon on your desktop.  
The **Configure Control Room settings** page appears.
2. Type the repository path.  
This is the location where the uploaded automation files, for example, IQ Bots, and TaskBots are stored. For example, `C:\ProgramData\AutomationAnywhere\Server Files`.
3. Enter the access URL.  
This is the URL for accessing your installation of Control Room.
4. Click **Save and continue**.



**Warning:** The **back** button of your web browser is automatically disabled after you click **Save and continue**. This ensures that the Credential Vault Master Key that generates matches the repository path and Control Room access URL.

To return to the **Configure Control Room settings** page, press `Ctrl plus F5` and restart.

The **Credential Vault settings** page appears.

**5.** Select from the following options:

- **Express mode:** The system stores your master key to connect to the Credential Vault. This option is not recommended for a production environment.
- **Manual mode:** You store the Master Key on your own, and then provide the Master Key when the Credential Vault is locked. Users use the Master Key to connect to the Credential Vault to secure their credentials and access them when creating and running TaskBots.



**Warning:** If you lose the key, you will not be able to access the Control Room.

---

**6.** Click **Save and continue**.

**Warning:** The **back** button of the web browser is automatically disabled after you click **Save and continue**. No further changes to the Control Room configuration or Credential Vault settings are allowed.

To make changes, reinstall the Control Room.

---

The **Authentication type for Control Room users** page appears.

**7.** Select Active Directory.

Automation Anywhere supports Active Directory Multi-Forest authentication for the Control Room. Before providing the Authentication Type, ensure the following:

- One-way or two-way trust is set up between all forests. For a one-way trust, this is from the Enterprise client forest to the Control Room forest (Control Room forest must always be the trusting forest).
- Two-way trust is set up for every domain in a forest.
- The root certificate of the LDAP server is imported using the provided CertMgr tool via command.
- The provided LDAP URLs per forest cannot be behind a load balancer. Also, all LDAP URLs must point to the root (main) domain controllers.
- The node that runs the Control Room is in the same domain network where the Active Directory runs.
- The user is in the parent domain and the URL points to the parent.

This ensures that when there are two or more forests, and one of the forest has a subdomain with a different name space, a user from the other forests does not have permission to access that subdomain.

**8.** Type the Domain username.

Ensure you use the User Principal Name (UPN) in the `username@domain.com` format.

The username you enter is for a user who has access to all domains using the same credentials.

**9.** Type the Domain password.

This user is not expected to use the Control Room. Although you have an option to update the password, use an Account with the password never expires option. If it expires, it can be updated but with some downtime.

**10.** Click **Discover connections**.

All discovered Active Directory domains with one or more sites per domain are shown.

By default all domains and sites are selected. If only one domain and one site under it is discovered, then it is shown in read-only mode and cannot be edited.

**11.** Select the domains and sites to use for authentication.

Select the domains and sites to use for authentication. Select a minimum of one site for each domain that is selected

**12.** Click **Test connections** to register the sites to use for authentication.

**13.** Click **Check connection**.

If Control Room is unable to connect to the Active Directory database, an error message appears.

**14.** Click **Next**.

The **Control Room first administrator** page appears.

**15.** Select the **Active Directory domain** from the drop-down list and type the Control Room administrator username.

**16.** Click **Check name in Active Directory**.

If the username is in the Active Directory the following user details are shown:

- **First name**
- **Last name**
- **Email**

You can edit these prepopulated fields.

**17.** Click **Save and log in**.

You are logged in to the Control Room as an administrator. You can now configure and manage the overall RPA environment with Control Room and clients.

After configuring the Control Room, install product licenses.

### Related tasks

[Configure Control Room for Active Directory: manual mode](#)

Configure the Control Room to authenticate users using Active Directory by manually adding the Lightweight Directory Access Protocol (LDAP) URLs.

[Configure Control Room database](#)

Configure the Control Room to authenticate users using the database option.

## Configure Control Room database

Configure the Control Room to authenticate users using the database option.

To configure the Control Room when you start it for the first time, do the following:

**1.** Open a browser and navigate to the Control Room URL.  
The **Configure Control Room settings** page appears.

- **Windows**

Double-click the Automation Anywhere Control Room icon on your desktop.

- **Linux**

Open a browser and navigate to the host name of the server on which you installed Automation Anywhere Control Room. Example: `myserver.mycompany.com`

---

**Note:** Do not retain a following slash at the end of the URL, as the validation will fail.

---

2. Enter the repository path.

- **Windows**

This is the location where the uploaded automation files, for example, IQ Bot s, and TaskBots are stored. For example,

```
C:\ProgramData\AutomationAnywhere\Server Files
```

- **Linux**

```
/opt/automationanywhere/enterprise/appdata
```

3. Enter the access URL.

This is the URL for accessing your installation of Control Room.

4. Click **Save and continue**.




---

**Warning:** The **back** button of your web browser is automatically disabled after you click **Save and continue**. This ensures that the Credential Vault Master Key that generates matches the repository path and Control Room access URL.

To return to the **Configure Control Room settings** page, press `Ctrl plus F5` and restart.

---

The **Credential Vault settings** page appears.

5. Select from the following options:

- **Express mode:** The system stores your master key to connect to the Credential Vault. This option is not recommended for a production environment.
- **Manual mode:** You store the Master Key on your own, and then provide the Master Key when the Credential Vault is locked. Users use the Master Key to connect to the Credential Vault to secure their credentials and access them when creating and running TaskBots.




---

**Warning:** If you lose the key, you will not be able to access the Control Room.

---

6. Click **Save and continue**.




---

**Warning:** The **back** button of the web browser is automatically disabled after you click **Save and continue**. No further changes to the Control Room configuration or Credential Vault settings are allowed.

To make changes, reinstall the Control Room.

---

The **Authentication type for Control Room users** page appears.

7. Select **Control Room database**.

8. Click **Next**.

The **Control Room first administrator** page appears.

9. Fill in the following fields:

- **Username:** Enter a user name.
- **First name** Enter the first name.
- **Last name** Enter the last name.
- **Email** Enter an email address.
- **Password** Enter a password.
- **Confirm password** Confirm the password.

10. Click **Next**.

The **Create security questions** page appears.

**11.** Enter three security questions and answers.

**12.** Click **Save and log in**.

You are logged in to the Control Room as an administrator. You can now configure and manage the overall RPA environment with Control Room and clients.

Install a license.

#### **Related tasks**

[Configure Control Room for Active Directory: manual mode](#)

Configure the Control Room to authenticate users using Active Directory by manually adding the Lightweight Directory Access Protocol (LDAP) URLs.

[Configure Control Room for Active Directory: auto mode](#)

Configure the Control Room to authenticate users using Active Directory by enabling the Control Room to discover and list domains and sites in your organization.

## Configure Control Room for HTTPS certificate

Configure Control Room for HTTPS mode using a self-signed or CA certificate either before or after performing a custom Control Room configuration.

Transportation Layer Security is configured as part of the Control Room installation. If that step was skipped or the certificate expires, configure the TLS certificate with this post-installation configuration.

---

**Important:** It is not recommended to use self-signed certificates. However, if you use a self-signed certificate, ensure you install the certificate on each device manually and accept the certificate to enable communication between the device and the Control Room after configuring the self-signed certificate.

---

**1.** Log in to the Control Room.

The Control Room instance launches in your default browser.

**2.** Change the Control Room URL setting and port to `HTTPS` and port number to `443`.

The **Website Security Warning** page is displayed.

**3.** Continue to the Control Room website to access the Control Room.

*[Configure Control Room authentication options](#)*

If you have already configured it, then log in to the Control Room.

#### **Related tasks**

[Import HTTPS and CA certificates](#)

After installing the Control Room, import a certificate for HTTPS, Certificate Authority (CA), or both using the Windows or Linux command prompt.

[Configure application Transport Layer Security](#)

Use the **Transport Layer Security (TLS) configuration** wizard page from the Automation 360 installer to generate a self-signed certificate or import a security certificate to set up a highly secure Control Room instance.

## Import HTTPS and CA certificates

After installing the Control Room, import a certificate for HTTPS, Certificate Authority (CA), or both using the Windows or Linux command prompt.

You can import HTTPS and CA certificates in the following scenarios:

- When you switch the Control Room from HTTP to HTTPS after Automation 360 is installed.
- The certificates expire or need modification, for example, when you add a new server.

These instructions apply to both Windows and Linux installations.

To import a CA or HTTPS certificate for configuring the Control Room for secure connection using the command prompt, perform the following steps:

1. Run the command prompt in administrator mode.
2. Navigate to the Automation Anywhere installation path.

The default installation path for Windows is `C:\Program Files\Automation Anywhere\Automation360`.

The default installation path for Linux is `/opt/automationanywhere/enterprise`

3. Enter or paste the following at the command prompt:

- For Windows HTTPS certificate, enter the command:

```
jdk11\bin\java -jar certmgr.jar -appDir "C:\Program Files\Automation Anywhere\Automation360" -setServerCert "C:\Users\cradmin\Desktop\test_automationanywhere_com.pfx" -privateKeyPass <PFX Password>
```

- For Linux CentOS HTTPS certificate, enter the command:

```
jdk11/bin/java -jar certmgr.jar -appDir "/opt/automationanywhere/enterprise" -setServerCert "/home/<user>/test_automationanywhere_com.pfx" -privateKeyPass <PFX Password>
```

- For Windows CA certificate, enter the command:

```
jdk11\bin\java -jar certmgr.jar -appDir "C:\Program Files\Automation Anywhere\Automation360" -importTrustCert "D:\<user name>\My Downloads\CA31.cer"
```

- For Linux CentOS CA certificate, enter the command:

```
jdk11/bin/java -jar certmgr.jar -appDir "/opt/automationanywhere/enterprise" -importTrustCert "CA31.cer"
```

4. During the installation, if you did not accept the default and indicated you want to upload your own (self-signed) certificate, add the following parameters to the `boot.db.properties` file that is located in the `config` folder, in the Automation Anywhere installation path.

- Windows file location:

```
root:\Program Files\Automation Anywhere\Automation360\config\boot.db.properties
```

- Linux file location:

```
/opt/automationanywhere/enterprise/config/boot.db.properties
```

Parameter:

```
trustServerCertificate=false
```

## Add Control Room certificate to Java Credential Store

Manually add or update the Control Room certificate to the Java Credential Store to ensure that the Bot agent is registered successfully and works as intended. Perform this task if the Java Credential Store does not accept the certificate and you see a certificate path validation error.

You must reinstall the certificates in the Java Credential Store if the Bot agent is updated.

To resolve the certificate on the browser of the Bot agent machine, download and install the certificate.

1. To download the certificate using Google Chrome, perform these steps:
  - a) Open the Control Room instance used to access the Bot agent.
  - b) Press the function key F12 to open the developer window.
  - c) Navigate to the Security tab and click View certificate option.  
The Certificate window appears.
  - d) In the Details tab, click Copy to file option.  
The Certificate export wizard appears. You can export and save the certificate in the required .CER format from this window.
  - e) Click Next and select the Base-64 encoded X.509 (.CER) option.
  - f) Export and save the file to a location of your choice.
  
2. To import the certificate, perform these steps:
  - a) Open the command window.
  - b) Enter `MMC` to launch the console window.
  - c) Select the Add/Remove Snap-in option from the File menu.
  - d) Double-click Certificates option and then select Computer account in the Certificates snap-in window.
  - e) Click Next and select the Local Computer option in the Select Computer window.
  - f) Click Finish to return to the console window.
  
3. Now add the certificates to the Trusted Root Certification Authorities and Trusted Publishers folders.
  - a) Select Trusted Root Certification Authorities to open the certification import wizard.
  - b) Right-click the Certificates option.
  - c) Select Import option from the All Tasks menu.  
The Certificate Import Wizard is launched.
  - d) Select Next and browse to the folder where you saved the certificate.
  - e) Click Next and select the option to place all certificates in a store.
  - f) Click Next and Finish to import the certificates.  
The certificate is imported successfully.
  - g) Click OK to return to the console window.
  - h) Repeat the above steps to import certificates in the Trusted Publishers folder.  
The console window now shows the certificates imported for current user.
  
4. Restart the Bot agent device to validate that the device is registered successfully.

For more information on troubleshooting steps, see [Automation 360: Error while registering device - An unexpected problem occurred \(A-People login required\)](#).

## Preparing for users

After completing initial installation and depending upon your deployment option, the post-installation configuration and validation, you are ready to prepare for users to login and work with bots.

See [User management](#).

## Trial licenses

Automation Anywhere Control Room trial License comes with an evaluation period of 30 days. This provides the user with an ability to assess the product and make an informed decision.

Trial licenses offer three *Bot Creators* and two *Bot Runners* to begin with; also a user can contact System Administrator or Automation Anywhere Sales to purchase a new license or extend the existing trial license.

To purchase an extended license or to install a new license:

1. Login to Control Room as an Admin and the Dashboard homepage is displayed.
2. A notification is displayed with remaining days for license expiry. Click **Show details**. A message appears with a link to **Install a new license** or to **contact System Administrator or Automation Anywhere Sales**

To view bot license and usage statistics, go to **Administration > Click Licenses**.

---

**Note:** Product and bot user license statistics is only visible to users with Admin role and users with License management permission,

---

The License page shows Product and bot User license statistics with details.

## Set up SAML authentication

Switch an authenticated environment Control Room database to a SAML identity provider (IDP).

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

---

**Note:** The SAML IDP side setup must be validated before configuring the Control Room. See [Configure the Control Room as a service provider](#).

---

To switch the Control Room to a SAML-authenticated environment, follow these steps:

1. Navigate to **Administration > Settings > User authentication**.
2. Click **Edit**.
3. Select the **Use SAML** option.

---

**Note:** The **Use Control Room database** option is selected by default.

---

4. In the **SAML metadata** field, enter the data from your SAML IDP setup.

```
<saml2:AuthnStatement
  AuthnInstant="authenticated_instance" SessionIndex="index_value_required">
```

5. In the **Unique Entity ID for Control Room (Service Provider)** field, enter the entity ID.
6. In the **Encrypt SAML Assertions** field, select one of the following options:

Option	Description
<b>Do not encrypt</b>	SAML assertions are not encrypted.
<b>Encrypt</b>	SAML assertions are encrypted.

7. Optional: Enter the **Public key** and **Private key** values.

---

**Note:** Enter keys only if you require encrypted SAML assertions.

---

**8. Click **Validate SAML Settings**.**

You are required to validate your SAML 2.0 settings before saving your changes.

When you click this option, you will be redirected to a SAML 2.0 service provider web page where you will be prompted to enter credentials and other data.

**9. Enter a different username.**

After validation is complete, you will be redirected back to this configuration page.

If the username already exists, an error appears.

**10. Click **Save changes**.**

Configure SAML on the local active directory.

**Related tasks**

[Configure the Control Room as a service provider](#)

## Edit profile

Manage user profiles.

For users of Control Room configured with a non-directory environment, change the password, first name, last name, and email address.

**1. Click the Device icon and select **Update credentials**.****2. In the **Device login credentials** section, enter the **Username** and **Password** for the device.**

Device login credentials are required to run a bot from this device.

---

**Note:** Automation 360 does not validate the device login credentials until you run a bot.

---

If your username is part of a domain, include the domain within the format `domain\username`. Typically, home users are not part of a domain, unless they are specifically configured.

If your username contains non-ASCII characters, ensure your system locale settings are configured to use these characters.

[Configuring post-installation settings](#)

**3. Click **Update****

## Installed Control Room directories and files

When installing the Automation Anywhere Control Room on different operating systems, the installer executes and installs files and folders in the following directories.

### Window OS directory structure

When you install the Automation Anywhere Control Room on Windows OS, the default installation directory for many configuration files is located:

```
C:\Program Files\Automation Anywhere\Automation360\
```

### Linux OS directory structure

When you install the Automation Anywhere Control Room on Linux OS, the installer creates the following directories.

Directory path	Description	Comments
/opt/automationanywhere/Enterprise	All binary files	
/opt/automationanywhere/Enterprise/config	Config files	
/var/log/automationanywhere/Enterprise	Log files	
/tmp	Temporary files	Directory that contains temporary files created by the system and users.  Files under this directory are deleted when the system is rebooted.
/opt/automationanywhere/Enterprise/appdata	Server files	Control Room repository folder.
/opt/automationanywhere/Enterprise/_Automation\ Anywhere\ Enterprise_installation/Logs/	Installer logs	Installation logs provide details about issues during installation, if any.

## Configuration files

---

**Note:** Automation 360 supports UTF-8 file encoding type. When you edit or create any Bot agent or Control Room configuration file, ensure to use UTF-8 file encoding type.

---

The minimum installed configuration files include:

- Installation license keys - Request the installer and appropriate license keys from your account manager.
- Bot Creator schedules configuration files
  - Log file name: logging.properties
  - Log file location: <install\_location>\config
- Auto-login configuration files
  - Configuration file name: autologinhelper-logging.xml
  - Configuration file location: C:\Program Files\Automation Anywhere\Bot Agent\config
- Device configuration files
  - Configuration file name: settings.properties
  - Configuration file location: <install\_location>\config
- Database configuration files

The database connection string is configured in:

- Configuration file name: boot.db.properties
- Configuration file location: <installation\_location>\config

Additional configuration files that are created as needed, include:

- Cluster configuration
  - Configuration file name: `cluster.properties`
  - Configuration file location: `<installation_location>\config\`
- Key distribution center (KDC)
  - Configuration file name: `um.properties`
  - Configuration file location: `<installation_location>\config\`
- Parallel repository tuning
  - Configuration file name: `boot.server.properties`
  - Configuration file location: `<installation_location>\config\`
- Remote Desktop Protocol (RDP)
  - Configuration file name: `deployment.properties`
  - Configuration file location: `<installation_location>\config\`
- URL resources
  - Configuration file name: `DWMP_CONNECTIONS.properties`
  - Configuration file location: `<installation_location>\DWAService\bin\src\main\resources`
- Trusted list restrictions
  - Configuration file name: `repository.properties`
  - Configuration file location: `<installation_location>\config\`
- Workload management
  - Configuration file name: `wlm.properties`
  - Configuration file location: `<installation_location>\config`

## Control Room Fail-Safe status

When the Control Room is unable to connect to the license server, it moves into Fail-Safe status.

With respect to the Control Room license server database, the Control Room can be in one of three status states. These states indicate what user licensing actions can be done. With each state change, an entry is made in the audit log.

### Active

Normal operations. All API calls from the Control Room are accepted by the license server.

Users can be assigned floating licenses as they log on. Floating licenses can be released as users log off.

### Fail-Safe

Only the heartbeat API call is allowed to the license server. All other calls from the Control Room are stopped.

Operations, such as granting logging in users a license, or deleting a license assigned to a logged in user are restricted.

**Fail-Safe-Expired**

The Control Room stops all operations, all users are logged out of the Control Room.

**Fail-Safe mode actions**

When the Control Room loses connection with the licensing server and moves into Fail-Safe mode:

- The Control Room administrator is sent an email notification, saying the Control Room is in Fail-Safe mode. The administrator can take remedial action to re-establish the connection.
- Currently logged in users continue to have access and can do tasks.
- User licenses cannot be allocated to or de-allocated from users.

**Fail-Safe-Expired mode actions**

When the Fail-Safe time limit expires, the Control Room moves into Fail-Safe-Expired state:

- All connected users are shut down.
- The Control Room reports Shutdown status to the license server.
- The Control Room shuts down.

**Active mode actions**

When the Control Room is restarted and operational, and connectivity to the license server established, the Control Room is in Active state:

- Users who had assigned licenses prior to the Fail-Safe, have their original licenses re-allocated.
- New users can request and be allocated licenses.

## Automation 360 licenses

The All Licenses page displays detailed information about current product and device licenses.

**Product licenses**

The Automation Anywhere Control Room is the web-based application at the center of the Digital Workforce providing enterprise-wide management and control. The Control Room ensures reliable, scalable, and secure bot deployment and execution. From this central vantage point, operators can receive tasks from the Bot Creator and push to the Bot Runners for execution with simple mouse clicks. The Control Room monitors and audits all scheduled and running bots, in real time.

The Control Room provides an automated mechanism for tracking and controlling the use of licensed software across Bot Creators and Bot Runners, addressing NIST Change Management CM-10.

## Device licenses

License	Permission
Bot Creator	Users with this license can create, edit, schedule, and trigger bots. Additionally, these users can execute bots in the following ways: <ul style="list-style-type: none"> <li>On their local machine</li> <li>From the public workspace if the Control Room administrator has specified a <b>Run as user</b> for unattended Bot Runner</li> </ul>
Bot Runner	Users with this license can execute bots, independently and asynchronously.
Unattended Bot Runner Run-time license	Users with this license can perform all automation tasks that attended users can perform. Additionally, this license can also be used for Automation Anywhere Control Room deployment, centralized scheduling, and API-based deployment. <hr/> <p><b>Note:</b> Triggers must be associated only with users who have an attended Bot Runner license. If you include users with unattended Bot Runner licenses, they must provide the login credentials of the default device.</p> <hr/>
Attended Bot Runner Run-time license	Users with this license can run bots on their devices. However, these users cannot run or schedule bots on another device.
Citizen Developer license	Users with this license can create and run bots (including bots with triggers) on their devices. <p><i>Create a Citizen Developer role</i></p>
Automation 360 IQ Bot	IQ Bot automates business processes that rely on semi-structured or unstructured data. IQ Bot licenses are purchased based on the number of pages of processing required.
Bot Insight	Bot Insight provides real-time, RPA native analytics for both business insights and operational intelligence. <p>The Bot Insight license is purchased on a per-user basis. To access the <b>Business</b> dashboard, the user must be assigned this license.</p>
Automation Anywhere Robotic Interface	The Control Room can combine the AARI user license with the Bot Creator and Bot Runner (attended and unattended) license types, which enables the user to access AARI on the web.

License	Permission
Discovery Bot	Process Discovery licenses must be purchased for use for business analysts and business users using Discovery Bot. Discovery Bot supports two licenses. The business analyst uses the process analyzer license to view and manage the metadata from all recordings within the process. The business user uses the process recorder license to view, record, and submit a process using the Discovery Bot recorder.

## Entitlement models

Two licensing models are available for Automation 360:

### File-based entitlements

When Automation 360 operates in a file-based entitlement mode:

- A license file is configured, generated, and installed for each Control Room.
- The Control Room administrator can then issue these licenses to specific user accounts.
- Each user consumes a license within a Control Room. If the same user is created in multiple Control Rooms, they will use up a license entitlement for each Automation Anywhere Control Room.
- File-based entitlements only supports a floating user license model.

### Cloud-based entitlements

Available and accessed from a cloud-based license server. Information exchanged between the Control Room and the license server meet GDPR compliance requirements. If you cannot allow access to an external service, such as the License Service, because of network or security constraints, contact Automation Anywhere support.

- The cloud-based GUID can be installed only if there are no users file licenses in use.
- Administrators can reallocate user licenses after installing the cloud-based GUID.
- Cloud deployment supports multiple tenant environments where each tenant possesses a unique license.

## RBAC on License Management

Access to License Management is deny-all and allow by exception based on roles and domains as defined in RBAC. Only those users who have access to License Management permission can view the entitlement details from the Automation Anywhere Control Room.

## Baseline inventory controls: Bot Creators, Bot Runners, and Bots

The Automation Anywhere Control Room manages all automation operations. Inventory controls are maintained through the application of RBAC to establish a single point of control for Base Line Configurations (NIST CM-2), access restrictions for configuration management (NIST CM-5 and 6). Automated baseline reporting can be configured.

## Product license permissions

This topic describes the available default product licenses.

Licenses are applied at the product level and the device level. At a minimum, apply the Control Room product license to view the Control Room. From that apply additional licenses to enable specific functions.

Licenses required	Privileges enabled
<b>Control Room</b> product license and <b>Bot Creator (Development)</b> device license	Automate bots in Enterprise client. Issued as number of users.
<b>IQ Bot</b> product license and <b>IQ Bot</b> device license	Run IQ Bots within the parent TaskBots.  The IQ Bot license number of users can be distributed between Unattended and Attended Bot Runners.  For example, if you have 50 licenses, you can allot any number between 0-50 to Unattended or Attended Bot Runners. The total licenses distributed to Unattended and Attended Bot Runners cannot exceed 50.
<b>Bot Insight</b> product license	Bot Insight provides real-time, RPA native analytics for both business insights and operational intelligence. Bot Insight Analytics license is purchased on a per user basis.
<b>Trial License</b>	A trial license is shipped with validity of 30 days; on expiry of <i>Trial licenses</i> the user must contact System Administrator or Automation Anywhere Sales to purchase a new license.

## Accessing Automation 360

Any new customer who orders our products receive license confirmation from Automation Anywhere.

The designated person responsible for configuring licenses for their company receives two email confirmations.

The **SSO** email from sso@automationanywhere.com grants you access to set up a new password for your Automation Anywhere Single Sign-On (SSO) account. The **Orders** email from orders@automationanywhere.com grants you access to your license entitlement information.

Do the following:

1. Open **SSO** email → access link.
2. Enter and confirm new password.
3. Access **A-People Community**.

4. There are two options to access your license entitlements.

Option	Action
<b>A-People</b>	Navigate to <b>LICENSES</b> .
<b>Orders email</b>	Access link to redirect to license page.

**Note:** Your license entitlement validation date is provided within the context of the **Orders** email and on the A-People License configuration page.

5. You now have access to your license entitlements.

On this page, you have access to more information of your order. The **Product Versions** shows your current license entitlement version, the **License Entitlements** shows the number of license entitlements in your order, and the **Control Rooms** shows the number of control rooms in your order, and allows to configure each licenses.

## Configure new Control Room licenses

The Control Room in your order now requires configuration to generate and download new licenses.

The numbers of Control Rooms are listed in the **Control Rooms** section. The status of current Control Rooms are shown as:

- **Available** - Control Room available for license configuration.
- **Draft** - Control Room license configuration in progress.
- **Pending Generation** - Control Room license generating in progress.
- **Active** - Control Room available to view, download, and reconfigure.

Do the following:

1. Login to the Apeople portal.
2. Click on **Licenses** Tab.
3. Navigate to **Control Rooms > CR-1**.
4. Select **CR-1** to configure new Control Room license.

**Note:** The **CR Name**, **Status**, and **Version** fields are filled depending on your license.

5. Enter a **Location** value.
6. Select an **Environment** option.

**Note:** Depending on your use cases, your options are **Production**, **Environment**, or **UAT**.

7. Enter a number for **Bot Runner Attended**, **Bot Runner Unattended**, and **Bot Creator**.
8. Check **Analytics > Bot Insight User (Analytical User)** and enter the number of users.
9. Select **Save & Generate**.
10. Select **Yes** to confirm and generate new license.

**Note:** An email confirmation is sent for your newly generated license. The license page automatically refreshes and the **CR-1** status now changes from **Available** to **Pending Generation**.

11. Select **Refresh**, the **CR-1** status updates to **Active**.
12. Select **CR-1** to view your generate Control Room license information.

**13. Select Download.**


---

**Note:** The downloaded file is now installable to your development Control Room environment.

---

**14. Close CR-1 and repeat process on remaining CR files.**

## Reconfigure existing Control Room licenses

The Control Room license can be reconfigured and updated at anytime.

In cases where new license entitlements are added or mistakes were made, reconfiguring an existing Control Room license is simple.

Do the following:

1. Navigate to **Control Rooms > CR-1**.
2. Select **CR-1** to reconfigure existing Control Room license.

---

**Note:** The **CR Name** will vary depending on user.

---

3. Select **Reconfigure**.
4. Select **Yes** to confirm reconfiguration.
5. Select **Edit**.
6. Update your values.

---

**Note:** The **CR-1** status now displays **Draft** as file is in reconfiguration.

---

7. Update the **Bot Runner Unattended** number for newly added license entitlements.
8. Select **Save & Generate**.
9. Select **Yes** to confirm edits.

---

**Note:** An email confirmation is sent with a link to access A-People License and to download the generated license. The license page automatically refreshes and the **CR-1** status now changes from **Draft** to **Pending Generation**.

---

10. Select **Refresh**, the **CR-1** status updates to **Active**.
11. Select **CR-1** to view your updated Control Room license information.
12. Select **Download**.

---

**Note:** The downloaded file is the most recent **Active**. The downloaded file is now installable to your development Control Room environment.

---

**13. Close CR-1 and repeat process for any CR files needing reconfiguration.**


---

**Note:** Administrators with a Cloud Control Room using a file license and wants to change to cloud license can manually disable all user licenses and then proceed to GUID installation, then reassign the user licenses.

---

## Get started with Community Edition

Use these tasks to register for, and start creating and using bots with Automation Anywhere Community Edition A2019.

1. Register for the Automation Anywhere Community Edition:

- a) From the Automation Anywhere website, <https://www.automationanywhere.com/>, scroll to and click the **Get Community Edition** option.  
Alternatively, select **Customers & Partners > A People Community > Community Edition**. Scroll to the registration form: **GET COMMUNITY TODAY**.

- b) Enter your identification information in the form that appears.  
The form information includes your first name, last name, email, country, phone number, and company. This information is used to create your Community Edition user login credentials.

---

**Restriction:** Only the period/dot (.) and at sign (@) are allowed in the email field. No other special characters are supported.

---

- c) Read and agree to the terms, privacy policy, and license agreement. Select and click **Submit**.  
Wait for the email from Automation Anywhere that contains the information for you to log in to the Community Edition. The email includes the Community Control Room URL, your username, and assigned user password. After you log in, you are prompted to reset your password.

To learn more, see [Training - Create bots without installation \(A-People login required\)](#). This course introduces you to learn how to download and register as a new Community Edition user.

## 2. [Log in to Automation Anywhere Control Room.](#)

To log in to Automation 360, open the Control Room URL in your browser, enter your credentials in the login screen, and click **Log in**.

## 3. Install the Bot agent, register your device, and set user device credentials.

[Install Bot agent and register device](#) | [Set user device credentials](#)

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

To enable a device for running bots, set the local device credentials.

If you are using an operating system other than Windows, you will not be able to install the Bot agent at this time. See [system requirements](#). However, you can still build bots using the [Bot editor](#).

## 4. [Create your first bot.](#)

Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

## 5. [Run your first bot.](#)

Run a bot from the same device that you used to create the bot.

Watch the following videos that illustrate some of the steps in this task:

- Installing the Bot agent in Automation 360:
- Building your first bot:
- Running your first bot in the Community Edition:

## Community capacity and limitations

Community users access and bot creation and running conditions.

### Number of bot creators per Community Edition user

Each Community Edition user can use one Bot Creator at a time.

<b>Number of bots created by Community Edition user</b>	Each Community Edition user can create multiple bots.
<b>Number of registered devices per Community Edition user</b>	Each Community Edition user can register multiple devices, but only be logged in to one at a time, and only run a bot on one device at a time.
<b>Number of bots run by Community Edition user</b>	Each Community Edition user can run one bot at a time on any one registered device.

## Log in to Automation Anywhere Control Room

To log in to Automation 360, open the Control Room URL in your browser, enter your credentials in the login screen, and click **Log in**.

Receive your registration confirmation email.

- **Automation 360 users:** This is sent by your system administrator.
- **Community Edition users:**
  1. Register for the Community Edition.  
*[Get started with Community Edition](#)*
  2. This is sent by Automation Anywhere using the information you provided when you registered.

This email contains:

- Control Room URL
- Username, credentials, and provisioning tokens (where applicable)
- Temporary password

Reset this password when you log in the first time.

1. Open the URL in your browser.
2. In the **Log in** form, enter your username and password.  
If this is the first time you are logging in, use the password provided in your welcome email.
3. **First-time users:** Change your password. For Cloud users, create your security questions.  
The change password and create security questions form automatically opens when you log in for the first time. Complete the form.
  - a) Complete the **Change password** fields.  
Enter your current password, enter your new password, and confirm the new password.  
Passwords must be 8-15 characters long and can only contain the following characters: a-z, A-Z, 0-9, at sign (@), dash (-), underscore (\_), exclamation point (!), number sign (#), dollar sign (\$), percent (%), ampersand (&), and period (.).
  - b) **For Cloud users:** In each pair of question and answer fields, enter a question and an answer that you will remember if you forget your password or must confirm your login.
  - c) Click **Save and log in**.

After the first login, to change the password, click your *username*, select **Change password**, and complete the form.

4. Optional: Select **Remember my username** to quickly log in to the Cloud Control Room.

- Optional: Click **Forgot password?** to reset your password.  
An email is sent to you with a link to the necessary page to reset the account password.
- Click **Log in**.

The credentials are authenticated directly with the Cloud Control Room or Community Control Room database.

---

**Note:** When you access the Enterprise Control Room with the **Login with Windows** option selected, you must enter the FQDN to log in successfully.

---

**Note:** Your account is locked if you enter the wrong password a specific number of times depending on the password policy set by your administrator. For security reasons, failed log-in attempts are audited. This allows the administrator to analyze and take appropriate actions.

---

### Related tasks

#### [Create your first bot](#)

Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

#### [Install Bot agent and register device](#)

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

#### [Reset user password](#)

The Control Room administrator generates an email process for the user to reset their password.

## Install Bot agent and register device

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

To install the Bot agent, the Windows installer policy must be enabled for the user device.

Ensure the device system date and time are in sync with the current date and time so that the device registration is successful.

The Bot agent version available for download is the latest and compatible with the Control Room version that is used.

---

**Note:** You cannot install a Bot agent on a device with an existing 10.x or 11.x Enterprise client.

---

- Log in to the Control Room through your Automation Anywhere URL using Google Chrome browser.
- Install the Bot agent and add a local device by choosing one of the following options:
  - From the menu on the right, click the device icon to connect a local device.
  - Go to the **Devices** page, and click the **Connect local device** icon located at the top-right of the Devices list.
- Click **Connect to my computer**.  
The Bot agent setup file is downloaded.

**4.** Follow the steps outlined in the wizard.

**Authenticated proxy access:** If your device's access to the internet is controlled through an authenticating proxy server, you are prompted to provide the proxy server authentication details. These credentials are required for the device to communicate with the Control Room.

To enable the authenticated proxy, register the device through a Google Chrome browser with the Automation Anywhere Chrome extension enabled.

---

**Note:** The Chrome extension is installed for Google Chrome Enterprise browser users even if the device is offline. The extension is downloaded along with the Bot agent MSI installer file.

---

**5.** Select an option to install the Bot agent either at the system level or user level.

- To install at the system level, select **Anyone who uses this computer (all users)**

All users of the device can use this Bot agent. However, users installing the Bot agent must have administrator privileges.

- To install at the user level, select **Only for me (username)**.

The Bot agent will be available only to the individual user.

**6.** Enter the following in the **Additional information** screen:

- Device nickname (optional)
- Device type (single user or multiple user)

---

**Note:** For a multiple user device, enter the number of concurrent sessions that will be allowed. A minimum of two concurrent sessions is supported.

---

**7.** Click **Done**.

- The Bot agent is registered as a Windows service: Automation Anywhere Bot agent Service.
- A shortcut to access AARI Assistant is added to the Windows Start menu and desktop.

**8.** Set the user device credentials so that your device can run bots.**9.** Refresh the **Devices** page and verify that the local device is added.

You can identify the devices by their IP address and hostname.

If you face any issues registering your device, see [Automation 360: Error while registering device - An unexpected problem occurred \(A-People login required\)](#).

If the Bot agent service is paused and does not start after installation, see [Automation 360 Error: Device is disconnected or needs upgrade \(A-People login required\)](#)

To learn more, search for the *Did You Know that Bot Runners and Control Room can now Communicate without Human Intervention?* course in [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#). This course demonstrates how to register devices in the Control Room.

Watch the following video on how to install the Bot agent in Automation 360:

Optionally, [Edit profile](#).

If your device is set with a proxy, see the following tasks that apply to your proxy settings:

- [Connect Bot agent to a device with a proxy](#)
- [Connect Bot agent to a device with a proxy using a script](#)

## Related concepts

### About device pools

Device pools are a logical grouping of devices or similar Bot Runner machines on which you can run your workload management automations or scheduled automations. For example, you can group devices of a specific department or unit and create a device pool for it.

## Related tasks

### Create device pools

Create a device pool with a unique name and add Unattended Bot Runners to the device pool.

### Set user device credentials

To enable a device for running bots, set the local device credentials.

## About the Bot agent

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. After installing the Bot agent on a device, a registered user with role-based access privileges can create, manage, and deploy bots on that device.

## Bot agent configuration

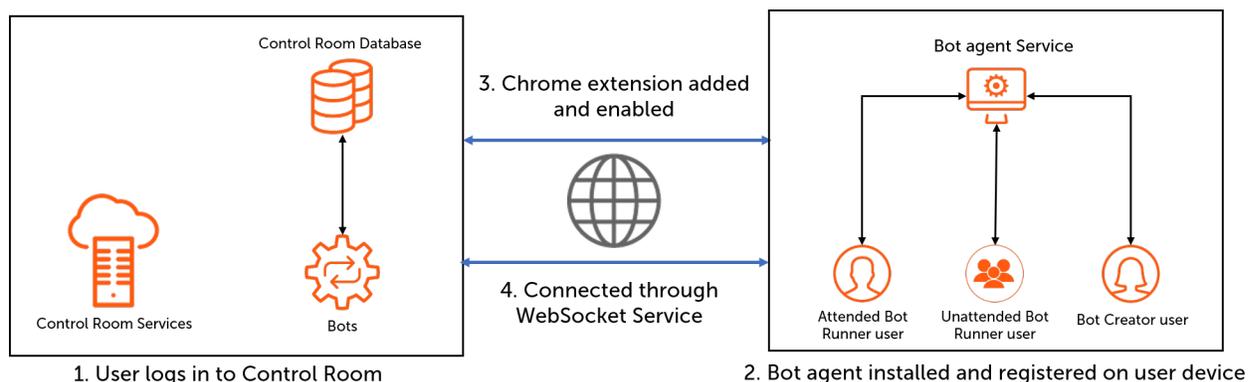
1. A user can log in to the Control Room using the credentials provided by the administrator after the Control Room administrator creates a user and shares the credentials with the user.
2. The user can now install the Bot agent and the user device is registered and mapped to that username in the Control Room.

---

**Note:** The Bot agent is registered as a user in the Control Room automatically only with Google Chrome browser. However, a user can use all supported browsers (including Google Chrome) to create, edit, and deploy bots.

---

3. The Bot agent is registered as a Windows service (Automation Anywhere Bot agent Service) on the user device and the Automation Anywhere extension is added to the user's Google Chrome browser.
4. The device communicates with the Control Room using WebSocket and stays connected.



## Privilege mapping

A user is granted privileges governed by role-based access and assigned a device license by the Control Room administrator. The user is allocated either a Bot Creator or Bot Runner license.

## Bot Creator

Users with Bot Creator licenses can log in to the Control Room from a browser to perform the following actions:

- Create, edit, or delete bots.
- Manage bots for using in Bot Insight, IQ Bot, and Bot Store.

## Bot Runner

Users with Bot Runner licenses are used to deploy bots from the Control Room.

A user can be allocated any one of the two licenses - Unattended or Attended Bot Runner license.

- Users with unattended Bot Runner license are configured to allow other Control Room users with required privileges to run and schedule automation from the Control Room. Such users are also referred as **Run as users**.
- Users with attended Bot Runner license are allowed to run attended automations on their own devices from the Control Room.

## Bot agent compatibility

Before you install the Bot agent, ensure it is compatible with the hardware and software in your environment.

- [Compatibility with Enterprise A2019 builds](#)
- [Hardware requirements](#)
- [Device compatibility](#)
- [Operating system compatibility](#)
- [Browser compatibility](#)
- [Supported extensions](#)
- [Auto-login support](#)

## Compatibility with Automation 360 builds

**Note:** The Bot agent version that is available for download is the latest and compatible with the Control Room version that is used.

Automation 360 version	Automation 360 build	Bot agent version
Automation 360 v.21	<ul style="list-style-type: none"> <li>• Build 9642 (On-Premises)</li> <li>• Build 9637 (Cloud and Community Edition)</li> </ul>	<ul style="list-style-type: none"> <li>• 21.81.10320</li> <li>• 21.81.10315</li> </ul>
Enterprise A2019.20	<ul style="list-style-type: none"> <li>• Build 8815 (On-Premises)</li> <li>• Build 8846 (Cloud)</li> </ul>	<ul style="list-style-type: none"> <li>• 20.17.9493 (On-Premises)</li> <li>• Cloud: <ul style="list-style-type: none"> <li>• 20.18.9528 (for US-West and Japan regions)</li> <li>• 20.17.9518 (for regions other than US-West and Japan)</li> </ul> </li> </ul>

Automation 360 version	Automation 360 build	Bot agent version
Enterprise A2019.19	<ul style="list-style-type: none"> <li>Build 8147 (On-Premises)</li> <li>Build 8145 (Cloud and Community Edition)</li> </ul>	<ul style="list-style-type: none"> <li>18.12.8825</li> <li>18.12.8823</li> </ul>
Enterprise A2019.18	Build 7560 (Cloud, On-Premises, and Community Edition)	16.19.8238
Enterprise A2019.17	Build 7103 (Cloud, On-Premises, and Community Edition)	16.7.7774
Enterprise A2019.16	Build 6463 (Cloud, On-Premises, and Community Edition)	14.3.7141
Enterprise A2019.15	Build 5933 (Cloud, On-Premises, and Community Edition)	12.7.6609
Enterprise A2019.14	Build 5322 (Cloud, On-Premises, and Community Edition)	12.1.6000
Enterprise A2019.13	<ul style="list-style-type: none"> <li>Build 4705 ( On-Premises)</li> <li>Build 4701 (Cloud and Community Edition)</li> </ul>	<ul style="list-style-type: none"> <li>9.0.5383</li> <li>9.0.5379</li> </ul>
Enterprise A2019.12	<ul style="list-style-type: none"> <li>Build 4111 (Cloud and Community Edition)</li> <li>Build 4105 (On-Premises)</li> </ul>	<ul style="list-style-type: none"> <li>7.0.4789</li> <li>7.0.4783</li> </ul>
Enterprise A2019.11	Build 3337 (On-Premises, Cloud, and Community Edition)	6.0.4015
Enterprise A2019.10	Build 2545 (Cloud, On-Premises, and Community Edition)	3.3.3211
Enterprise A2019.09	Build 2094 (Cloud, On-Premises, and Community Edition)	3.0.2772
Enterprise A2019.08	<ul style="list-style-type: none"> <li>Build 1610 (On-Premises only)</li> <li>Build 1598 (Cloud and Community Edition)</li> </ul>	<ul style="list-style-type: none"> <li>1.0.2288</li> <li>1.0.2276</li> </ul>
Enterprise A2019.07	<ul style="list-style-type: none"> <li>Build 1089 (On-Premises only)</li> <li>Build 1082 (Cloud and Community Edition)</li> </ul>	<ul style="list-style-type: none"> <li>1.0.1767</li> <li>1.0.1760</li> </ul>
Enterprise A2019.06	Build 543 (Cloud, On-Premises, and Community Edition)	1.0.1221
Enterprise A2019.05	Build 336 (Cloud, On-Premises, and Community Edition)	1.0.1014

## Hardware requirements

You can install the Bot agent on devices that meet the following hardware requirements.

Device	Processor	RAM	Storage (free disk space)	Network
Machine	Intel Core i3 2.6 GHz with 4 multi-cores or higher 64-bit	<ul style="list-style-type: none"> <li>4 GB (Minimum)</li> <li>8 GB (Recommended)</li> </ul>	32 GB Add 100 through 150 KB per Automation Anywhere script Add 40 through 50 GB per long-term project	<ul style="list-style-type: none"> <li>5Mbps (Minimum)</li> <li>20Mbps or higher (Recommended)</li> </ul>
Additional users on a multi-user device	2 CPU per additional user	4 GB per additional user	No additional storage required	No additional network needed

### Additional RAM requirements for the registered devices

Add additional RAM to account for applications and services running on the registered devices, for example:

- Microsoft Office applications (example: Excel)
- Browsers (example: Google Chrome)
- Enterprise applications (example: CRM, Oracle EBS, and SAP)
- VDI infrastructure applications
- Anti-virus software

### Additional disk space on registered devices

- Automation 360 scripts average approximately 100-150 KB. Additional free disk space is required to develop automation projects because temporary files such as screenshots, server logs, and audit files are created during the execution of the automation scripts.
- Free space required increases with the project size. Recommendation: Have at least 40-50 GB of free disk space for each long-term project.
- Increase storage space configuration after installation, as needed, depending on product usage. For example, depending upon the complexity of your bot, generating log files and logic creation require additional disk space later.

## Device compatibility

A device running the Bot agent to perform automation must meet the following requirements:

---

**Note:** Device requirements are different for the Control Room and Bot agent. For Control Room compatibility, see [Operating system, environment, and platform supported for Control Room](#)

---

**On-Premises machines**

Physical machines running any of the supported operating systems.

**Terminal servers**

Remote desktop (RDP) running on supported operating systems from Enterprise A2019.11 or later.

**Virtual machines**

From Enterprise A2019.09 or later, the Bot agent can be installed on all virtual machines (VMs) with supported Windows OS.

For AISense recorder to work on a VM, enable AVX instructions for both Bot Runner and Bot Creator.

For details, see [Automation 360: AI Sense Recorder is crashing \(A-People login required\)](#)

The Bot agent is certified on all major versions of VMs and supports the following:

- Amazon Web Services EC2 on Windows 10 Pro and Windows 2012 Server, Windows 2016 Server, and Windows 2019 Server Standard and Datacenter edition.
- Amazon Web Services WorkSpaces on Windows 10 Pro edition.
- Google Compute Engine on Windows 2012 Server, Windows 2016 Server, and Windows 2019 Server Standard and Datacenter edition.
- Microsoft Azure Virtual Machine (VM) on Windows 10 Pro and Enterprise edition.
- VMware VMs on ESXi 6.x for Windows 10 Pro and Windows 2016 Server.
- Citrix XenDesktop (VDI) on Windows 2016 Server
- Citrix VM on Windows 10 Enterprise and Windows 2016 Server

---

**Recommendation:** When you install the Bot agent on virtual machines, ensure that you change the virtual machine **Power and Sleep** settings to **Never** so that bot deployments from the Control Room can run without interruption.

---

## Operating system compatibility

You can install the Bot agent on machines running the following operating systems.

This compatibility applies to On-Premises and Cloud deployments, and the Community Edition of Automation 360.

---

**Note:**

- Only 64-bit operating system version supported.
- Bot Creator tasks are supported with all the listed operating systems.
- You cannot register a device that is running on a Linux system. The Bot agent cannot be installed on Linux systems. However, you can use a registered device running on a Windows system to access a Control Room that is installed on a Linux system.

Windows version	Windows edition	Attended Bot Runner	Unattended Bot Runner	Bot Creator
Windows Server 2019	Datacenter and Standard	Supported	Supported <sup>1</sup>	Supported
Windows Server 2016	Datacenter and Standard	Supported	Supported <sup>1</sup>	Supported
Windows Server 2012	Datacenter and Standard	Supported	Supported <sup>1</sup>	Supported
Windows 10	Professional and Enterprise	Supported	Supported <sup>1</sup>	Supported
Windows 8 <sup>2</sup>	Professional and Enterprise	Supported	Supported	Supported
Windows 7 <sup>2</sup>	Professional and Enterprise	Supported	Supported	Supported

### (1) Auto-login

- Auto-login is only supported on 64-bit systems.
- If the Auto-login fails, configure the **Local Security Policy** settings. For example, in Windows, select **Security Settings > Local Policies > Security Options**. Enable the **Interactive logon: Do not require CTRL +ALT+DEL** option.

### (2) Supported OS

Windows 8 (64-bit) supported on Enterprise A2019 Builds 1598 and 1610 or earlier.

Windows 7 (64-bit) supported on Enterprise A2019.12 or later.

## Browser compatibility

The user interface for Bot agent is through a browser. Log in to Automation 360 using the supported browsers.

You can use the Google Chrome browser to install the Bot agent and register your device automatically in the Control Room. The following table shows the supported browser with version to register a device:

Browser	Browser version
Google Chrome	57 or later

You can use the following browsers to record, create, and run bots from your device:

Browser	Browser version
Google Chrome	57 or later
Microsoft Edge based on Chromium	79 or later
Microsoft Internet Explorer	11

---

**Note:** Microsoft Edge based on Chromium is certified for recording web applications with Universal Recorder from your device.

---

## Supported extensions

When you connect your Bot agent device to the Control Room, you can enable the following extensions from your browser to record and run bots:

Extension name	Extension version	Link to extension
Google Chrome	1.2.0.0	<a href="#">Automation 360 extension for Chrome</a>
Microsoft Edge based on Chromium	1.2.0.0	<a href="#">Automation 360 extension for Microsoft Edge</a>
Mozilla Firefox	1.2.0.2	<a href="#">Automation 360 extension for Mozilla Firefox</a>

## Auto-login support

Auto-login is used to automatically log on to a device, run a scheduled automation, and restore the device to its original locked or logged off state after running the automation.

For operating system support specific to auto-login on Bot agent devices, see [Auto-login support for Bot agent](#)

### Related tasks

[Install Bot agent and register device](#)

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

### Related reference

[Automation 360 feature comparison matrix](#)

Use the feature comparison matrix to compare the Automation 360 features with the features in Automation Anywhere Enterprise 11.3.x and 10.x versions.

[Universal Recorder supported applications and browsers](#)

Use the Universal Recorder to record interactions with objects from the supported technologies.

## Auto-login support for Bot agent

Use auto-login to automatically log on to a device, run a scheduled automation, and restore the device to its original locked or logged off state after running the automation.

Auto-login restores a device to its original state in the following scenarios:

- When an automation is stopped or paused either from the Control Room or device. This ensure that the security of the machine is not compromised when an automation is paused or stopped.

---

**Note:** When the automation resumes, it continues to run in the background on the locked device.

---

- When an automation encounters an error during execution.

The following table identifies the operating system support specific to auto-login on Bot agent devices.

SID#	Scenario	Windows 2019	Windows 2016 R2	Windows 2012 R2	Windows 10	Windows 8	Windows 7
1	No user session established (user is not logged in)	Not applicable for virtual machines	Not applicable for virtual machines	Not applicable for virtual machines	Supported on local Windows 10 device and virtual machines only	Not certified	Not certified
2	User session established	Not applicable for virtual machines	Not applicable for virtual machines	Not applicable for virtual machines	Supported on local Windows 10 device and virtual machines only	Not certified	Not certified
3	User has logged in but locked the screen	Not applicable for virtual machines	Not applicable for virtual machines	Not applicable for virtual machines	Supported on local Windows 10 device and virtual machines only	Not certified	Not certified
4	A different user (not the device login user used for deployment) is logged in	Not applicable for virtual machines	Not applicable for virtual machines	Not applicable for virtual machines	Supported on local Windows 10 device and virtual machines only	Not certified	Not certified
5	A different user is logged in and locked the screen	Not applicable for virtual machines	Not applicable for virtual machines	Not applicable for virtual machines	Supported on local Windows 10 device and virtual machines only	Not certified	Not certified

SID#	Scenario	Windows 2019	Windows 2016 R2	Windows 2012 R2	Windows 10	Windows 8	Windows 7
6	Fast user switching	Not applicable for virtual machines	Not applicable for virtual machines	Not applicable for virtual machines	Supported on local Windows 10 device and virtual machines only	Not certified	Not certified
7	No active RDP session	Supported	Supported	Supported	Supported	Supported	Supported
8	User has active RDP session	Supported	Supported	Supported	Supported	Supported	Supported
9	User's RDP session is disconnected	Supported	Supported	Supported	Supported	Supported	Supported
10	User's RDP session is locked	Supported	Supported	Supported	Supported	Supported	Supported
11	Another user has active RDP session	Supported	Supported	Supported	Supported	Supported	Supported
12	Another user has a disconnected session	Supported	Supported	Supported	Supported	Supported	Supported
13	Another user has an active session and locked	Supported	Supported	Supported	Supported	Supported	Supported

- Auto-login is only supported on 64-bit operating systems.
- Auto-login is unable to sign-out the root admin session, when trying with scenarios that involve two different auto-login users. Remember to log out of the admin user account before deploying a bot.
- For scenarios 4, 5, and 6 in the above table, the active user is logged off and a new session created with device credentials for deploying the bot.
- If auto-login fails, configure the **Local Security Policy** settings. For example, in Windows, select **Security Settings > Local Policies > Security Options**. **Enable** the **Interactive logon: Do not require CTRL+ALT+DEL** option.

### Related tasks

#### [Configure auto-login settings](#)

Configure auto-login settings in the Control Room to either create user sessions or reuse existing user sessions to reduce the bot startup time.

#### [Customize device settings](#)

Customize the settings for user devices at the device level such as device lifespan, auto-login, screen resolution, deployment, and other advanced options.

### Related reference

#### [Bot agent compatibility](#)

Before you install the Bot agent, ensure it is compatible with the hardware and software in your environment.

## Working with the Bot agent

Users can perform tasks based on their access privileges after installing the Bot agent on their device.

### Install and update the Bot agent

To install and update the Bot agent, you must perform these tasks:

1. If you are using the Bot agent application for the first time, verify all prerequisites to install the Bot agent are complete.

[Bot agent compatibility](#)

2. Install the Bot agent on your device.

[Install Bot agent and register device](#) | [Perform silent installation of Bot agent on temporary devices](#)

Connect the Bot agent to your device using an authentication proxy to ensure changed proxy setting or credentials are updated so that bots can be deployed on your device.

[Connect Bot agent to a device with a proxy](#) | [Connect Bot agent to a device with a proxy using a script](#)

3. Set device credentials to enable the Control Room to deploy bots on your device.

[Set user device credentials](#)

4. Switch to a different Control Room based on your automation requirements.

[Switch Bot agent to a different Control Room](#)

5. When updates are available, you can update the Bot agent to the latest version.

Depending on the settings for the Bot agent, you can either automatically update or manually update your Bot agent.

[Automatically update the Bot agent](#) | [Manually update the Bot agent](#)

6. Verify the Bot agent version and device connection in the Control Room > **Devices** page.

[Devices](#)

### Related tasks

Users can also perform the following tasks:

- Use the Bot agent diagnostic utility to perform diagnostic checks on Bot Runner devices and to help in resolution of Bot agent connectivity challenges.

[Perform Bot agent diagnostic checks](#)

- Use the Bot agent relevant logs to resolve issues.

[Bot agent log files](#)

- View the Bot agent performance data for analysis.

[Bot agent status processing](#)

- Create and edit TaskBots

[Create your first bot](#) | [Editing bots](#)

- Deploy bots on attended and unattended Bot Runners with or without Workload automation.

[Run a bot](#) | [Schedule a bot](#) | [Run bot with queue](#)

- Manage different bots and packages using Bot Store, Bot Insight, and IQ Bot.

[Bot Store](#) | [Using Bot Insight](#) | [Get started with IQ Bot](#)

- Perform other activities such as updating user profile.

[Edit profile](#)

---

**Resources:** For additional information about the Bot agent, see this training course: [Automation Anywhere Certification \(A-People login required\)](#)

---

## Perform silent installation of Bot agent on temporary devices

Edit the Bot agent MSI file to silently install the Bot agent on temporary devices or non-persistent virtual desktop infrastructure (VDI) in the Control Room.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task.

Ensure the following requirements are completed:

- Bot agent setup and MSI files are downloaded from the Control Room and the parameters required to install temporary devices are available in the Bot agent MSI file.

If you are not able to access the MSI files, contact support on <https://www.automationanywhere.com>.

- Windows 10 Software Development Kit including Orca and Control Room are installed on your device.

You can install Orca from `C:\Program Files (x86)\Windows Kits\10\bin\10.0.18362.0\x86\Orca-x86_en-us.msi`.

1. Navigate to the Control Room.
2. Download the Bot agent setup file.
3. Navigate to `<application filepath>\crui\asset` to access the MSI file used to silently install the Bot agent.  
For example: `C:\Program Files\Automation Anywhere\Enterprise\crui\asset`
4. Edit the `AutomationAnywhereBotAgent.msi` file using the Orca tool.
5. Click the **Property** option.
6. Enter appropriate values for the following parameters:

Parameter	Description
AA_CRTOKEN	Enter the registration key that is used to install the Bot agent on multiple devices at a time in bulk.  The registration key is provided by the Control Room admin.  See <a href="#">Generate registration key to install Bot agent in bulk</a> .
AA_CRURL	Enter the Control Room instance to which the Bot agent will to be connected.

Parameter	Description
AA_DEVICE_TYPE	Enter one of the following values for the device type: <ul style="list-style-type: none"> <li>• Single user</li> <li>• Multiple users</li> </ul>
AA_LIFESPAN	Enter one of the following values for a non-persistent or persistent device: <ul style="list-style-type: none"> <li>• TEMPORARY</li> <li>• PERSISTENT</li> </ul> <hr/> <p><b>Note:</b> Enter the values in uppercase letters when you install the Bot agent.</p> <hr/>
AA_CONCURRENT_SESSIONS	Enter the concurrent sessions allowed, from 1 through 99. The default value is 1.
AA_INSTALL_ONLY	Choose whether you want to install the Bot agent without registering with the Control Room. <ul style="list-style-type: none"> <li>• Enter <code>True</code> to only install and not register the Bot agent.</li> <li>• Enter <code>False</code> to install and register the Bot agent.</li> </ul>
AA_DEVICE_POOL_NAME	Enter a value to accept the device pool name and add the device to the device pool. The default value is 0.

7. Save the changes.
8. Copy the `AutomationAnywhereBotAgent.msi` file to the VM instance (golden image) on which you want to install the Bot agent.
9. Run the `AutomationAnywhereBotAgent.msi` file.
10. Validate that the Bot agent is installed on the VM instance and Bot agent service is not running in the Task Manager Services tab.

To deploy the Bot agent on temporary devices, you must configure the SysPrep settings and create machine images on the VM instance.

11. Shut down the VM instance without SysPrep after you enable temporary or non-persistent computer name settings for the VM.  
For an example of how to use SysPrep on AWS EC2 instance, see [Use Sysprep to create and install custom reusable Windows AMIs](#).
12. Create machine images on the VM instance as required.  
For an example of how to create Amazon Machine Images (AMI) from an AWS EC2 instance, see [Create an AMI from an Amazon EC2 Instance](#).

If a Bot agent is registered in the VM instance by mistake, perform these steps to restore the machine image:

1. Uninstall the Bot agent from the Windows Control Panel of the VM instance.

2. Delete all files from `C:\Windows\System32\config\systemprofile\AppData\Local\AutomationAnywhere`.
3. Enter `True` for the `AA_INSTALL_ONLY` parameter in the `AutomationAnywhereBotAgent.msi` file that you previously used to install the Bot agent.

Validate that the devices are added as temporary devices on the Control Room **Devices** page.

### *Devices*

#### **Related tasks**

##### [Configure auto-delete temporary device settings](#)

Configure your device settings to automatically delete a temporary device when the device is disconnected from the Control Room after a certain time interval.

##### [Generate registration key to install Bot agent in bulk](#)

The Control Room administrator can generate a registration key to install the Bot agent on multiple devices at a time in bulk.

##### [Edit the Bot agent installer file](#)

Edit the Bot agent MSI installer file to add the registration key and Control Room URL to remotely install the Bot agent on multiple devices.

## Automatically update the Bot agent

A Control Room administrator can choose to automatically update the Bot agent to a later version using the auto-update capability. This reduces the downtime because each user is not required to log in to the Control Room to update the Bot agent installed on the user device.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

The Windows installer policy must be enabled for the user device. The user installing the Bot agent must have Windows administrator rights to run the Bot agent service.

Ensure the following:

- The Bot agent version is 12.1.6000 or later.
- All user devices are connected to the Control Room.
- The Control Room self-signed certificate is imported to the Java Credential Store on the user machine when the Bot agent is installed for the first time.

The option defaults to auto-update based on the Automation 360 deployment you use.

- Auto-update is enabled by default for the Automation 360 Cloud and Community Edition.
- Manual update is enabled by default for the On-Premises.

1. Navigate to **Administration > Settings > Devices**.
2. Select **Bot-agent software** settings.
3. Click **Edit**.
4. Select **Automatically update all bot agents**.

This option notifies the Control Room whether the Bot agent requires an update and automatically updates the Bot agent when the user device is connected.

During the update, new deployments to that device are queued.

5. Click **Save changes**.

Verify the Bot agent version and device connection in the **My Devices** page of the Control Room.

**Related tasks**[Manually update the Bot agent](#)

The Bot agent, a lightweight application that enables you to run bots on your device, requires an update when a new version becomes available.

**Related reference**[Devices](#)

The device is a machine through which a user connects to the Control Room to create or run bots. Manage devices that are registered to the Control Room through the **Devices** page located in the **Manage** tab.

## Manually update the Bot agent

The Bot agent, a lightweight application that enables you to run bots on your device, requires an update when a new version becomes available.

To install the Bot agent, the Windows installer policy must be enabled for the user device.

The Bot agent version available for download is the latest and compatible with the Control Room version that is used.

1. Log in to the Control Room through your Automation Anywhere URL.
2. Navigate to **Manage**.

On the **Devices** page, the device status indicates whether the Bot agent requires an update. The arrow color on the device icon indicates the status:

- Red—update required
- Blue—update available, but not required
- Green—current version, no update required

Alternatively, for your local device only, if the status icon indicates an update, click the device icon in the header.

3. From the device icon, click **Add local bot agent**.
4. Click **Connect to my computer**.
5. Click the **Manually download the latest version** link.  
This option appears only if you have an existing Bot agent installed.
6. When the `AutomationAnywhereBotAgent.exe` is downloaded, click **Next**.

The following message is displayed: Connected to your computer. Your local bot agent has been successfully installed configured.

---

**Note:** You can also update a single device with row-level actions.

---

Watch the following video on how to update the Bot agent in Automation 360:

If you see the following message displayed: Device is disconnected or needs upgrade!, see [Error: Device is disconnected or needs upgrade \(A-People login required\)](#)

Verify the Bot agent version and device connection in the **Devices** page of the Control Room.

**Related tasks**[Automatically update the Bot agent](#)

A Control Room administrator can choose to automatically update the Bot agent to a later version using the auto-update capability. This reduces the downtime because each user is not required to log in to the Control Room to update the Bot agent installed on the user device.

**Related reference**[Devices](#)

The device is a machine through which a user connects to the Control Room to create or run bots. Manage devices that are registered to the Control Room through the **Devices** page located in the **Manage** tab.

## Switch Bot agent to a different Control Room

Switch the Bot agent on a registered device to work with a different Control Room manually when you work on automations using different environments.

Ensure that you have the start, stop, and pause permissions to access and edit the Windows services.

Perform this task to manually associate your device with a different Control Room in the following scenarios:

- When the Control Room is on a different release version.
- When the setting to switch devices is **not** enabled in the Control Room.

1. Stop the Bot agent service from the local Windows Task Manager.
2. Navigate to the following folder: `C:\Windows\System32\config\systemprofile\AppData\Local\AutomationAnywhere`
3. Optional: Delete the `registration.properties` file.

---

**Note:** This is only required if you want to register the device in a different Control Room environment. To view the Control Room where the device is registered, open the `registration.properties` file and check the value for the Control Room URL.

---

4. Delete all `.db` files.  
For example, `AA-DB.mv.db` file.
5. Log in to the Control Room.
6. Navigate to **Devices > My devices**.
7. Click the **Add local device** icon.
8. Download and install the latest Bot agent.
9. Return to the **Devices** page in the Control Room from the updated device to check the device status.  
The `registration.properties` file is not generated immediately after the Bot agent installation. It is generated only when a user accesses a Control Room URL from that device. If the device registration is successful, the machine is shown as **Connected** and the `registration.properties` file is created at the specified location on the Bot Runner machine.
10. Navigate to the `C:\Windows\System32\config\systemprofile\AppData\Local\AutomationAnywhere` folder to ensure that the `registration.properties` file is present and verify the Bot agent update.

Watch the following video on how to update your Bot agent:

### Related tasks

[Install Bot agent and register device](#)

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

[Switch device registration between Control Room instances](#)

Configure the device settings in the Control Room to enable single-user devices to use different instances of the Control Room. This option enables you to register the Bot agent on multiple Control Room instances and switch to another instance without reinstalling the Bot agent.

## Set user device credentials

To enable a device for running bots, set the local device credentials.

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices. Add the local device before editing the credentials. See [Install Bot agent and register device](#).

For Community Edition users, your profile contains only one set of credentials at a time. These credentials are applied to any device you select to run your bots. Ensure each device that you use accepts the credentials in your profile.

Automation 360 Cloud users have the option to apply different credentials to registered devices.

1. Click the device icon and select **Update credentials**.
2. In the **Device login credentials** section, enter the **Username** and **Password** for the device. Device login credentials are required to run a bot from this device.

---

**Note:** Automation 360 does not validate the device login credentials until you run a bot.

---

If your username is part of a domain, include the domain within the format `domain\username`. Typically, home users are not part of a domain, unless they are specifically configured.

3. Click **Update**.

[Create your first bot](#)

## Connect Bot agent to a device with a proxy

If your Bot agent cannot connect to the Control Room due to proxy settings, complete the steps in this task to add the authentication details.

Typically, when you change your proxy settings, whether you added a proxy or changed the credentials to the authenticating proxy, the Bot agent prompts for the new credentials.

If you have to manually add or update the authenticating proxy credentials, complete the following steps:

1. Open the Microsoft command prompt in administrator mode.
2. List the proxy status by running the command: `netsh winhttp show proxy`
3. If the command returns `Direct access`, then run the command: `netsh winhttp import proxy source = ie`
4. Restart the Bot agent.
5. Open a Google Chrome browser with the Automation Anywhere extension enabled.
6. Log out and log back in to the Control Room.  
If prompted, provide the proxy credentials.
7. From the Control Room, check the device status and verify that it is connected.

## Connect Bot agent to a device with a proxy using a script

If your device cannot connect to the Control Room because the device proxy setting is configured to use an automatic configuration script, complete the steps in this task to run the script to provide the authentication details.

You can perform these steps before or after installing the Bot agent.

To add or update the proxy, perform the following steps:

1. Download PSTools.

*PsExec*

2. Extract the files from downloaded zip file.
3. Open the Microsoft command prompt in administrator mode.
4. Change to the directory where you extracted the PSTools files.
5. Execute the following command:

```
.\psexec -i -s -d cmd
```

6. In the new command prompt window, execute the following command:

```
whoami
```

The system returns the following:

```
nt authority\system
```

7. Execute the following command:

```
inetcpl.cpl
```

8. In the **Internet Properties**, navigate to **Connections > LAN settings**.
9. Select the **Use automatic configuration script** option.
10. Provide the address to the proxy auto-configuration (PAC) file.  
For example: `http://localhost:888/proxy.pac`.
11. Click **OK**.
12. Restart the Bot agent in Windows Services.
13. From the Control Room, check the device status and verify that it is connected.

## Perform Bot agent diagnostic checks

Use the Bot agent diagnostic utility for connectivity-related issues between the Bot Runner device and Control Room. The utility helps to diagnose issues either by providing solutions or suggestions to help resolve the issues.

Ensure the Bot agent is installed on the user device.

1. Open the Windows command prompt.
2. Navigate to `C:\Program Files\Automation Anywhere\Bot Agent`.

3. Enter `AADiagnosticUtility.exe` to run the Bot agent diagnostic utility.  
Various options to perform the diagnostic check are displayed with their descriptions.

Option	Description
<code>-checkProxy &lt;CR_URL&gt;</code>	<p>Check the proxy settings on the device.</p> <p>When the Bot Runner device is unable to connect to the Control Room, use this option to verify if a proxy is available or configured for the Bot agent to use.</p> <p>You are also provided the option to import proxy settings using the <code>importProxy</code> option.</p>
<code>-configProxy &lt;CR_URL&gt;</code>	<p>Check proxy configuration and configure proxy credentials, if required.</p> <p>When the Bot Runner device is unable to connect to the Control Room because of missing credentials for an authenticated server, use this option to configure the proxy server credentials. Verify that the connectivity problem is resolved by logging in to the Control Room.</p>
<code>-importProxy &lt;CR_URL&gt;</code>	<p>Import the proxy settings from a logged-in user device to the system user device.</p> <hr/> <p><b>Note:</b> You must have administrator permission to import proxy settings.</p> <hr/> <p>When the Bot Runner device is unable to connect to the Control Room because of proxy server issues, use this option to import the proxy settings from a logged-in user to the system user for the Bot agent.</p> <p>This option provides information about the following:</p> <ul style="list-style-type: none"> <li>• Whether the proxy server is authenticated or not.</li> <li>• Control Room URL is added to the safe recipients list in the proxy server.</li> <li>• WebSocket connections are allowed as part of the proxy configuration.</li> </ul>
<code>-checkWSError &lt;CR_URL&gt;</code>	<p>Check for WebSocket connectivity and errors.</p> <hr/> <p><b>Note:</b> Error messages are maintained in the device memory and are removed when the Bot agent service is restarted from Services tab of the Windows Task Manager.</p> <hr/> <p>When a Bot Runner device is unable to connect to the Control Room because of WebSocket connection errors, this option provides the possible reasons for further investigation.</p>

Option	Description
<pre>-importSSLCertificate   path_to_ssl_certificate</pre>	<p>Import a SSL certificate into the Java credential store, if required.</p> <hr/> <p><b>Note:</b> You must have administrator permission to import the SSL certificate.</p> <hr/> <p>When the Bot Runner device is unable to connect to the Control Room because of an invalid SSL certificate, use this option to import the SSL certificate. You must ensure a valid certificate file is available in the file location specified in the <code>importSSLCertificatepath_to_ssl_certificate</code> option.</p> <p>You must restart the Automation Anywhere Bot agent service so that the imported certificate becomes effective.</p>
<pre>-validateSSLCertificate   &lt;CR_URL&gt;</pre>	<p>Check for a valid SSL certificate and view whether the certificate is valid or invalid.</p> <hr/> <p><b>Note:</b> You must have read permission to perform this check.</p> <hr/> <p>When the Bot Runner device is unable to connect to the Control Room because of an invalid SSL certificate, use this option to check and view if the SSL certificate is valid or not. To resolve the issue, use the <code>importSSLCertificate</code> option.</p>
<pre>-ping &lt;CR_URL&gt;</pre>	<p>Check connectivity between the Control Room and Bot Runner devices.</p> <p>Use this option to check if a Bot Runner device can ping (reach) the Control Room.</p>
<pre>-list</pre>	<p>View active bot deployments on the local devices.</p> <p>Use this option to check and list the automation (bots) that are running.</p>

Option	Description
<code>-checkDownloadError &lt;CR_URL&gt;</code>	<p>Check for bot dependency download errors if the bot deployment fails.</p> <hr/> <p><b>Note:</b> Error messages are maintained in the device memory and are removed when the Bot agent service is restarted.</p> <hr/> <p>Use this option when the Bot Runner device is connected to the Control Room but automations fail because the dependent packages are not downloaded on the Bot Runner device. In this case, the utility provides suggestions for further diagnosis.</p>

4. Enter the following option in the command prompt: `<filepath>\AADiagnosticUtility.exe -<br><option> <CR_URL>`  
 For example, to verify WebSocket errors, enter the following in the command prompt:  
`AADiagnosticUtility.exe -checkWSError https://yourcrurl.com/`  
 The option returns the following result: `Recently this device have not encountered any Web Socket errors`  
 Use the other options to perform further diagnostic checks.

## Create your first bot

Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

This task is performed by the user who wants to build and deploy . You must have the necessary rights and permissions to complete this task, and authorization to log in to the as the licensed user.

---

**Note:** These steps describe the guided workflow for first time users. The guided workflow is only displayed the very first time you complete these steps.

---

1. Log in to your instance of the Automation Anywhere Control Room.
2. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location `\Bots\`.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.

---

### Important:

- When creating a bot, ensure that your bot name does not include the following special characters: forward slash (/), backslash (/), question mark (?), pipe (|), asterisk (\*), lesser than sign (<), greater

than sign (>), double quotation marks ("), comma (,), left or right braces ({}), left or right brackets ([ ]), plus sign (+), and percentage sign (%).

- The bot name must be unique. If a bot with the same name exists in the same folder location which you have access to in the public workspace, you will not be able to either create or rename the bot with this name in the private workspace.

---

### 3. Insert a **Message box** action.

- Click **Actions**.
- Search for the Message Box package.  
Click in the **Actions** search box and enter `message`. Click the arrow to expand the Message Box options.
- Double-click or drag the **Message box** action to the Bot editor (open space to the right).

### 4. In the dialog box on the right, specify the conditions for the **Message box** action.

- In the **Enter the message box window title** field, enter `My first bot!`.
- In the **Enter the message to display** field, enter `Go be great!`.
- Accept the defaults in the **Scrollbar after lines** field and **Close message box after** check box.

### 5. Click **Save**.

Your bot is now ready to run.

### 1. Click through the Bot editor options for viewing and editing bots:

They are located at the top of the Bot editor.

- **Flow:** Graphical representation of the process (default).

---

**Note:** The Flow view is disabled when you create or edit a bot and the bot exceeds 500 lines of code. Use the **Show list view** option to navigate to the list view.

- **List:** Sequential entries for each action.

---

**Note:** Drag the selected action within the task logic.

- **Dual:** Split screen of the Flow and List views.

### 2. Run your bot from your device.

See [Run your first bot](#).

## Run your first bot

Run a bot from the same device that you used to create the bot.

Log in to your instance of the Automation Anywhere Control Room, and complete these steps:

1. [Install Bot agent and register device](#)
2. [Set user device credentials](#)
3. [Create your first bot](#)

These steps describe the guided workflow for first-time users. The guided workflow is only displayed the very first time you complete these steps.

You can run a bot from the following devices:

- The same device you are using to log in to the Control Room.
- Another device you registered that has the same login credentials as the machine you are using to log in to your Community Control Room or a device with defined credentials in the Control Room.

---

**Note:** Windows NT LAN Manager (NTLM) is a challenge or response authentication method that enables clients to provide their user name and password as encrypted credentials or plain text. Use Google Chrome browser to enable the Automation Anywhere extension and capture the proxy information. After the proxy information is captured, you can use any browser to run a bot in Automation 360.

---

1. Locate and select your bot.

From your Control Room dashboard, select **BOTS > My Bots**.

2. Select the bot to run.

From the **Files and folders** table, mouse over the ellipsis (three stacked dots) to the right of your bot's name.

The **Edit TaskBot** panel appears.

3. Click the **Run Task bot** icon.

The **Run bot now** window opens. In the **Task Bots** table, your bot is selected to run.

4. Click **Next**.

The **Device** tab opens with a table of one or more registered devices.

5. If your device is not already selected, select your device to run the bot, and click the right arrow.

6. Click **Run bot now**.

Control Room uses the credentials in your profile to log in to the device you selected and runs the bot.

The **In progress activity** window opens with the status of the running bot. When the bot is done, it disappears from this window.

7. Click **Historical** to see if your bot ran successfully.

Watch the following video on how to run your first bot in the Community Edition:

Build bots using variables, actions, and the Universal Recorder. See [Get started building bots](#).

## Update to latest Automation 360 version

If you are already using Automation 360 On-Premises, you can update to the latest version of Automation 360.

- Before each release update, ensure that you back up the database, repository, and installation configuration files.
- Ensure you are on one of the previous three releases from the latest release (on an  $n-3$  release, where  $n$  refers to the latest release).

For example, to update to Automation 360 v.21 release, you must be on the v.20, v.19, or v.18 release. However, to update from v.15 to Automation 360 v.21 release, you must first update to v.18 release and then update to Automation 360 v.21 release. In the second scenario, ensure you perform backup of v.15 data before you update to v.18, and then backup v.18 data before you update to v.21.

---

**Important:** When you update from an Automation 360 release earlier than an n-3 release to the latest release, you might see an Elasticsearch Open Distro error message. Before updating, delete the multiple application\_log indices from Elasticsearch, which will free up disk space for the update.

- For details on how to delete the application\_log indices, see [How to delete application\\_logs\\_\\* indices from Elasticsearch in Automation 360 \(A-People login required\)](#).
  - For details on the Elasticsearch indices limit, see [Cluster-level shard allocation and routing settings](#).
- 

1. Log in to Automation Anywhere Support site to download the latest version of the Automation 360 setup file: [A-People Downloads page \(Login required\)](#).
2. On the Downloads page, click the link to the latest Automation 360 setup file.
3. Click `Installation Setup`, and then click either `Linux Setup` or `Windows Setup` based on the operating system of the machine on which you want to install Automation 360.
4. Download the `Automation360_Build_<build-number>.<file-extension>` file.
5. Install the latest version of Automation 360 without uninstalling your current version.

[Installing Control Room On-Premises](#)

---

**Important:** You must use the SQL database of the current version in the newer version of Automation 360.

---

## Related concepts

### [Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

## Update Automation 360 on Microsoft Windows Server using scripts

Update Automation 360 using a customized script with parameters to maintain existing user configurations.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task.

- Verify [Automation 360 On-Premises prerequisites](#).
- Ensure that you have the following:
  - Automation Anywhere Control Room installation file
  - TLS certificate
  - License file

Create and execute a PowerShell script to update Automation 360.

1. Create a PowerShell script with the required parameters:

The following is a sample PowerShell script for upgrading Automation 360:

```
# Script Begins
# It fetches Data from config.properties file present under the same
  directory level

$PropertyFilePath = 'C:\script\config.properties'
$rawProperties = cat $PropertyFilePath
$propertiesToConvert = ($rawProperties -replace '\\', '\\') -join
[Environment]:: NewLine;
```

```

$properties=ConvertFrom-StringData $propertiesToConvert
$env:SEE_MASK_NOZONECHECKS = 1

# Setting up the logger and InstallerRoot Directory

$baseLogFilePath=$properties.baseLoggingDirectory
$logFilePath=$baseLogFilePath+'Express_CR_Installation_Scenario1.txt'
$baseInstallerPath=$properties.baseInstallerDirectory
$installer_name_regex=$properties.installerNameRegex

# Logging Begins

Start-Transcript -Path $logFilePath -Append -IncludeInvocationHeader

$binary = Get-ChildItem $baseInstallerPath | Where-Object { $_.FullName -
imatch $installer_name_regex }
$a = $binary.FullName
$final_commandline = " /update /s /v/qn /v""/L*v
  CR_Onprem_Installationlog_Scenario1.txt""

# Recording the Start Time
Get-Date -Format g

# Invoking the Installer here
$processdetail = (Start-Process -FilePath $a -ArgumentList
  $final_commandline -Wait -Passthru).ExitCode

# Recording the End Time
Get-Date -Format g

Stop-Transcript

```

2. Optional: Customize the script to include parameters according to your requirements.
3. Save the script to the installation server.
4. Log in to the installation server as administrator.
5. Start PowerShell in administrator mode.
6. Execute the following:

```

Set-ExecutionPolicy Unrestricted -Scope CurrentUser -Force
.\install.ps1

```

---

**Note:** The silent installation logs are stored in the folder from which the installation script is executed. For example, if you run the script from `C:\Silent Install`, the logs are stored in the `C:\Silent Install` folder.

---

7. Validate the following:
  - All Automation Anywhere services are running in Windows Task Manager.
    - [Verifying Automation Anywhere services](#)
  - You are able to log in to the Control Room from a supported browser.
    - [Log in to Automation Anywhere Control Room](#)
  - You are able to install the required license in the Control Room.
    - [Installing additional licenses](#)
  - All automations (deployed and scheduled) are running in the Control Room.
    - [Activity](#)

## Install and update Automation 360 IQ Bot

This collection of topics guide you through the process of installing or setting up Automation 360 IQ Bot Community Edition, On-Premises, and Cloud.

- **System prerequisites**

Review the operating system and database compatibility, database information, and the hardware and software requirements for Automation 360 IQ Bot.

[IQ Bot system requirements.](#)

- **Install Automation 360 IQ Bot**

If you are new to Automation 360 IQ Bot, log in to the Automation Anywhere support site to download and install the latest Automation 360 IQ Bot build.

[A-People Downloads page \(Login required\)](#)

---

**Note:** Automation 360 IQ Bot On-Premises uses a 3-node cluster to ensure high availability (HA).

[High availability and disaster recovery overview](#)

- **Update Automation 360 IQ Bot:** If you are using an earlier version of Automation 360 IQ Bot, update to the latest available version.

[Update Automation 360 IQ Bot On-Premises to the latest version](#)

- **Using IQ Bot**

Cognitive automation in IQ Bot can learn and transform important, but less structured data to automate business processes quickly and efficiently.

[Using IQ Bot features .](#)

### Automation 360 IQ Bot Community Edition

Receive your IQ Bot URL and login credentials.

- The URL points to your Automation 360 instance.
- If you are an IQ Bot Community Edition user, the login credentials are those you set when you registered.
- Complete the steps in [Get started with Community Edition.](#)

The steps for IQ Bot Community Edition are the same as Automation 360 registration.

- Begin using IQ Bot Community Edition by creating learning instances.

Watch the following video to understand how to create a learning instance in the Automation 360 IQ Bot Community Edition:

### Automation 360 IQ Bot On-Premises

---

**Important:** The steps you perform to install Automation 360 IQ Bot On-Premises are the same as the installation steps for IQ Bot Version 6.5.2 and later.

---

1. Go to Automation Anywhere support site and download the Automation 360 IQ Bot On-Premises package:

[A-People Downloads page \(Login required\)](#)

2. Use the following installation instructions:

[Installing IQ Bot](#)

## Automation 360 IQ Bot Cloud deployed

Follow these steps to deploy and register as a user:

1. Receive your Control Room URL and login credentials

The URL points to your Automation Anywhere IQ Bot instance.

If you are your company's principal administrator and ordered Cloud deployed Automation 360 IQ Bot, you receive an email from Automation Anywhere with your URL and credentials.

2. [Log in to Automation Anywhere Control Room](#)

To log in to Automation 360, open the Control Room URL in your browser, enter your credentials in the login screen, and click **Log in**.

3. Create your users in the Control Room.

You can create users for the following roles:

- AAE\_IQBotAdmin
- AAE\_IQBotServices
- AAE\_IQBotValidator

Use the assigned roles to connect to IQ Bot.

4. Go to the Control Room dashboard to access the IQ Bot URL link.

Connect to IQ Bot with the assigned user role, and begin creating learning instances.

### Related concepts

[Get started with Automation 360 Cloud](#)

Use these tasks to start creating and using bots with Automation 360 Cloud.

[Migrate to Automation 360 IQ Bot](#)

Migration is the process of upgrading from earlier versions of IQ Bot (11.x, 6.x, or 5.x) to the latest Automation 360 IQ Bot version. This includes replicating your existing database and repository, converting your bots to Automation 360 format, and migrating all the learning instances.

## IQ Bot system requirements

Review the operating system and database compatibility, database information, and the hardware and software requirements for Automation 360 IQ Bot.

---

**Legal disclaimer:** The information provided in this workflow might vary depending on which offering is being used. Administrative instructions might not be applicable to Automation 360 IQ Bot Community Edition.

---

The following tables list the operating system and database compatibility with Automation 360 IQ Bot On-Premises:

Operating system	Supported platforms	Database type	Database version	Database edition
Microsoft Windows Server:	<ul style="list-style-type: none"> <li>• Microsoft Azure Virtual Machines</li> <li>• Amazon Elastic Compute Cloud (Amazon EC2)</li> <li>• Google Cloud Platform</li> <li>• Amazon WorkSpaces</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft SQL Azure (RTM)</li> <li>• Amazon Relational Database Service (Amazon RDS)</li> <li>• Microsoft SQL Server</li> </ul>	<ul style="list-style-type: none"> <li>• 2019</li> <li>• 2017</li> <li>• 2016</li> <li>• 2014</li> <li>• 2012</li> </ul>	<ul style="list-style-type: none"> <li>• Express</li> <li>• Standard</li> <li>• Enterprise</li> </ul>
<p><b>Note:</b> As of Enterprise A2019.19 (Build 8147), Windows Server 2012 is no longer supported.</p>				

The following tables provide the required database information:

Microsoft SQL Server and Amazon RDS databases	
Required information	Description
Database (SQL Server) authentication	Provide credentials for a Microsoft SQL Server user who has permission to connect to the database.
Database name	IQBot
Database port	Default: 1433
Service credentials	Provides the user with the following permissions: <ul style="list-style-type: none"> <li>• CONNECT SQL</li> <li>• CREATE ANY DATABASE</li> <li>• VIEW ANY DATABASE</li> </ul>

## Hardware requirements

IQ Bot	Recommendation
Application server optimum requirements	<ul style="list-style-type: none"> <li>• 32 GB RAM</li> <li>• 8 Core Processor with support for AVX instructions set (this is a requirement starting from A2019.19)</li> <li>• 500 GB hard disk space</li> <li>• Ensure drive C has 100 GB plus free hard disk space</li> </ul>

IQ Bot	Recommendation
For all IQ Bot related database servers	<ul style="list-style-type: none"> <li>• 16 GB RAM</li> <li>• 8 Core Processor</li> <li>• 500 GB hard disk space</li> </ul> <hr/> <p><b>Note:</b> If you are hosting IQ Bot databases along with other application databases, ensure the hardware resources are increased proportionately.</p> <hr/>

## Software requirements

Software	Details
Database Management System	<a href="#">Automation 360 IQ Bot feature comparison matrix</a>
Automation Anywhere Control Room	<a href="#">Automation 360 IQ Bot version compatibility</a>
Web browsers	<p>Google Chrome 80 (or later)</p> <hr/> <p><b>Important:</b> When using Internet Explorer11, you might have to <b>Display intranet sites in Compatible View</b> in the <b>Compatibility View Settings</b> window.</p> <hr/>
Dependencies	<p>Automation 360 requires the following software, which is automatically installed during the installation:</p> <ul style="list-style-type: none"> <li>• Microsoft .NET Framework v4.7.2</li> </ul> <p>The system prompts for a restart to complete the update.</p> <ul style="list-style-type: none"> <li>• Erlang v23.0.4</li> <li>• RabbitMQ v3.8.8</li> <li>• NodeJS v10.22.1</li> <li>• NodeJS v10.24.1</li> <li>• Microsoft SQL Server 2012 Native Client- QFE</li> <li>• Python 3.9.5 (32 bit)</li> <li>• Python 3.8.5 (32 bit)</li> </ul> <hr/> <p><b>Note:</b> In a cluster environment, all dependencies will be installed on each machine where IQ Bot is installed.</p> <hr/>

**Important:** Automation Anywhere does not support stretch clusters.

- Ensure that all the HA cluster nodes are configured in the same location. Do not configure the nodes in a single HA cluster that is located across various sites. Ensure that you configure one HA cluster at the primary site and the other HA cluster at the secondary site.

- The Control Room and IQ Bot must be configured in the same data center to ensure communication between both the applications.

---

## Updating Automation 360 IQ Bot

Update Automation 360 IQ Bot On-Premises to the most recent version for all the latest features and enhancements.

Ensure you back up your existing IQ Bot learning instances. Depending on the Automation 360 IQ Bot version you are currently using, the following update options are available:

- **Update from earlier Automation 360 IQ Bot builds (1089, 1598, and 2079) to the latest Automation 360 IQ Bot On-Prem version**

The earlier versions of Automation 360 IQ Bot had five databases. A single unified database is available starting with Automation 360 IQ Bot On-Premises Build 2545. Use the migration script to migrate these five databases to a unified database.

*Run IQ Bot On-Premises database migration script*

- **Update to the latest version of Automation 360 IQ Bot On-Prem.**

Ensure you update your existing Automation 360 IQ Bot On-Premises to the latest version which provides the product improvements and bug fixes.

*Update Automation 360 IQ Bot On-Premises to the latest version*

## Run IQ Bot On-Premises database migration script

IQ Bot On-Premises Builds 1089, 1598, and 2079 included five databases. Starting with IQ Bot On-Premises Build 2545, one unified database is supported. You have to run a migration script to migrate the databases of Builds 1089, 1598, 2079 to the latest build.

Before you run the migration script, you must be on the latest IQ Bot On-Premises build, and verify that the SQL command utility `SQLCMD.exe` is installed on your system.

Also, verify and ensure Microsoft ODBC Driver 17 for SQL Server is installed on the IQ Bot server. This can be obtained from: <https://www.microsoft.com/en-us/download/details.aspx?id=56567>

1. Uninstall the current build of IQ Bot On-Premises.
2. Install the latest IQ Bot On-Premises build.

During installation, a new IQ Bot database is created.

---

**Note:** Remember your database username and password in order to the update migration script value.

---

3. Navigate to your `Binn` folder.

This might be located in `C:\Program Files\Microsoft SQL Server\Client SDK\ODBC\170\Tools\Binn.`

#### 4. Verify that `SQLCMD.exe` is installed.

If `SQLCMD.exe` is not installed, follow these steps:

- a. Download and extract the `Data Migration.zip` from the [Installation Setup](#) folder onto the IQ Bot server.
- b. Navigate to **DataMigration > UTILITY-MsSqlCmdLnUtils**.
- c. Run `MsSqlCmdLnUtils.msi` to install `SQLCMD.exe`.

After `SQLCMD.exe` is installed, run the migration script.

1. Access the `AA.IQBot_Database_Migration.bat` file within the `DataMigration` folder.
2. Edit the `AA.IQBot_Database_Migration.bat` file.
3. Update the values as follows:
  - a) Set the `SQLCMD` value to the path of your `Binn`.

```
SQLCMD="C:\Program Files\Microsoft SQL Server\Client SDK\ODBC\170\Tools
\Binn\SQLCMD.exe"
```

- b) Set `LOGIN` value to your database username.

```
LOGIN="database username"
```

---

**Note:** The **bulkadmin**, **dbcreator**, and **public** roles are required to run the migration script.

---

- c) Set the `PASSWORD` value to your database password.

```
PASSWORD="database password"
```

- d) Set the `SERVER` value to the path of your database server hostname.

```
SERVER="path of database server hostname"
```

4. Run the migration script `AA_IQBot_Database_Migration.bat` file with administrator privilege. After the migration is complete, an output is created. Verify `C:\Datamigrationlog.txt` for log history and errors.

---

**Note:** If an output is not displayed, contact support.

---

## Update Automation 360 IQ Bot On-Premises to the latest version

If you are using any of the earlier versions of Automation 360 IQ Bot On-Premises, you can update to the latest version, which offers enhancements and bug fixes.

It is recommended that you review your existing Automation 360 IQ Bot On-Premises version and back up your database, output path, and installation configuration files.

---

**Note:** Uninstall the existing version of Automation 360 IQ Bot On-Premises from your device before updating to the latest version.

---

1. Go to Automation Anywhere support site to download the latest version of the Automation 360 IQ Bot setup file.  
[A-People Downloads page \(Login required\)](#)
2. Click the link to the latest Automation 360 IQ Bot setup file.
3. Click `Installation Setup`.

4. Download the `Automation_Anywhere_IQ_Bot_A2019_Build_<build number>.exe` file and install it.

*[Installing IQ Bot](#)*

The latest version of Automation 360 IQ Bot On-Premises is installed on your device.

## Get started with IQ Bot

IQ Bot is a web-based, cloud-native intelligent document processing solution that can read and process various complex documents and emails. It combines RPA with multiple AI techniques to intelligently capture, classify, and extract semi-structured and unstructured data, allowing document-centric business processes to be automated end-to-end.

Automation 360 IQ Bot is a hybrid solution for On-Premises and Cloud deployments, and includes a Community Edition. This is an interim solution provided for IQ Bot Cloud enablement and integration with Automation 360.

From the Build 4695 (A2019.13), Automation 360 IQ Bot has feature parity with IQ Bot Version 11.3.4.2, and some features from Version 11.3.5.

For feature parity information between Automation 360 IQ Bot and the corresponding IQ Bot 11.x versions, see *[Automation 360 IQ Bot feature comparison matrix](#)*.

### Set up learning instances in Automation 360 IQ Bot

Automation Anywhere processes customer data and uses the created bots to extract and parse the data to a CSV output file. This section describes the end-to-end process of how a new IQ Bot learning instance is set up for the first time.

1. In the **Learning Instance** tab, create a new learning instance, upload sample documents to train, and select the OCR engine for document processing.
  - *[Creating a learning instance](#)*
  - *[Select an OCR engine](#)*
2. Train the uploaded sample documents in the IQ Bot Designer.
 

*[Start training in the IQ Bot Designer](#)*
3. During the training, you can add and use custom logic in the Designer to improve data extraction in production.
 

*[Add custom logic in IQ Bot to improve extraction](#)*
4. After training is complete, the learning instance is ready for production. You can upload documents for processing.
5. In Automation Anywhere Control Room, upload documents for processing the images and extracting the required fields into a CSV file using the IQ Bot **Upload document action** on the Bot Runner workstation. The IQ Bot server analyzes the uploaded documents using an AI model.

*[Upload document action](#)*

Files are uploaded from the local folder on the workstation to the IQ Bot server through a secure HTTPS session. Uploaded production documents are deleted after successful processing.

These uploaded documents are stored in a database. The data is encrypted and cannot be accessed by anyone.

*[IQ Bot database encryption](#)*

6. Download the extracted data (csv file) by using the **Download all documents action** on the Bot Runner workstation. Besides the successfully extracted CSV files, this action also downloads any unclassified, untrained, and invalid documents to the local directory.

*Download all documents action*

7. Unclassified and invalid documents are moved to a separate folder for manual validation.

*IQ Bot Validator*

# Migrate to Automation 360

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

Automation 360 is a single, integrated cloud-native Digital Workforce platform that is designed for flexibility and agility. Migrating to this platform provides you benefits such as faster time to value, business agility, and lower TCO.

For more information, see [About Automation 360](#).

## What is migration?

The migration process copies all your 11.x or 10.x entities such as users, roles, lockers, and bots to Automation 360. This eliminates the efforts required to re-create all these entities in Automation 360. The migration process also eliminates the possibility of missing out on copying an entity that might be required to run a bot after migration. All the 11.x or 10.x entities are ready for use in Automation 360 after they are successfully migrated, except bots and MetaBots.

When 11.x or 10.x data is migrated, bots are copied as `.atmx` files and MetaBots are copied as `.mbot` files. You must convert these bots and MetaBots to the Automation 360 format before you use them.

Migration also includes migrating your IQ Bot learning instances and Bot Insight dashboards.

### **IQ Bot migration**

When migrating 11.x or 10.x bots, migrate your IQ Bot learning instances. Before starting the IQ Bot migration, ensure that your Automation 360 environment is installed and set up for use. IQ Bot migration involves migrating the bots built to use IQ Bot as well as the IQ Bot learning instances that have been trained for data extraction.

Use the IQ Bot server upgrade and learning instance procedures to move the information over to your new system. See [Migrate to Automation 360 IQ Bot](#).

### **Bot Insight migration**

Migration of the Bot Insight data and dashboard is performed as part of the overall migration process. It involves cloning your Bot Insight database (which is separate from your Enterprise 11.x Control Room database) and using the pre-migration utility to extract your dashboard metadata (widgets, layouts, and so on).

Bot Insight migration to Automation 360 Cloud is not yet supported.

## Migration phases

Migration involves three main steps, as shown in the following image:



### 1. *Check migration readiness*

Analyze your bots using the Bot Scanner and review the generated report to verify your migration readiness.

### 2. *Plan and prepare for migration*

Choose your deployment model (Cloud, On-Premises, or Cloud-enabled) and request for the migration licenses. Prepare your Control Room and environment for the migration.

### 3. *Migrate and validate bots*

Convert your 11.x or 10.x bots to Automation 360 format. After migration, verify the converted bots run successfully, and update bots as required based on the migration reports or testing phase.

## Tools used for migration

The following tools are available for migration:

### **Bot Scanner**

The Bot Scanner scans your existing bots (TaskBots and MetaBots) and generates reports. These reports provide information about the commands and variables used in these bots and how many of these commands and variables are supported for migration in Automation 360. (The scanner was previously called the pre-migration utility.)

[Bot Scanner overview](#)

### **Bot Migration Wizard**

Integrated in the Automation 360 Control Room, this tool guides you through the process of converting the bots to the Automation 360 compatible format after you have completed the prerequisites steps. The wizard enables you to migrate multiple bots (TaskBots and MetaBots) and their dependent bots.

The migration wizard migrates a bot only if all of the components used in that bot are supported for migration in Automation 360.

[Migrate Enterprise bots](#)

### **Cloud Migration Utility**

This tool enables you to upload all your 11.x data to Automation Anywhere Cloud. After the data is successfully uploaded to Cloud, the Cloud Control Room is created and all the uploaded data is available for use in that Control Room.

[Upload 11.x data using Cloud Migration Utility](#)

**Audit log data migration utility**

This utility enables you to export the audit log data from the 11.x Control Room to a JSON file. You must paste the JSON file in the Automation 360 repository and then migrate the audit log data.

**Bot Insight pre-migration utility**

This utility enables you to export 11.x Bot Insight dashboard metadata (widgets and layouts) and dashboard profiles as a zip file. You must paste the zip file in the Automation 360 repository to migrate the Bot Insight dashboards.

*[Export 11.x Bot Insight dashboards for migration](#)*

## Choose your migration path

After you have verified the migration readiness for your current version, choose your migration path based on the Automation 360 deployment model that meets your business requirements.

If you are on this version	Start your migration
11.x	<ul style="list-style-type: none"> <li>• <a href="#">11.x to Automation 360 Cloud</a> (using the Cloud Migration Utility)</li> <li>• <a href="#">11.x to Automation 360 On-premises</a></li> <li>• <a href="#">Manually migrate to Automation 360 Cloud</a></li> <li>• <a href="#">11.x to Cloud-enabled</a></li> <li>• <a href="#">11.x to Automation 360 on Linux CentOS</a></li> </ul>
10.x	<p><a href="#">10.x to Automation 360 On-premises</a></p> <hr/> <p><b>Note:</b> Migration from 10.x to Automation 360 Cloud is not supported.</p> <hr/>

If you want to continue using your Automation Anywhere Enterprise version and Automation 360 in parallel, use one of the following methods.

If you want to use these dual environments	Use this procedure
11.x and Cloud	<a href="#">11.x and Automation 360 Cloud in parallel</a>
11.x and On-Premises	<a href="#">11.x and Automation 360 On-Premises in parallel</a>
10.x and On-Premises	<a href="#">10.x and Automation 360 On-Premises in parallel</a>

## Other resources

The following resources can help you in your journey with Automation 360:

- [Migration resource center](#): Access multiple migration resources, including videos, project templates, and high-level information from one place.
- [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#): Access the [Migrating to Automation 360](#) learning trail.
- [Automation 360 Migration FAQ](#)

- [A-People Knowledge Base \(A-People login required\)](#)

### Related tasks

[Update to latest Automation 360 version](#)

If you are already using Automation 360 On-Premises, you can update to the latest version of Automation 360.

## Tools for migration

We have moved the information that was on this page to other pages. See the following links for more information.

- For an overview of migration, including information that was previously on this page, see [Migrate to Automation 360](#).
- For information about Bot Scanner, see [Bot Scanner overview](#).
- For information about Bot Migration Wizard, see [Bot Migration Wizard](#).

## Check migration readiness

Perform the tasks in this workflow to verify whether you are ready to migrate to Automation 360 from 11.x and 10.x.

1. Verify the current version of your 11.x or 10.x platform.  
[Verifying your 11.x or 10.x version for migration](#)
2. Check whether your current 11.x or 10.x version is supported for migration.  
[Supported versions for migration](#)
3. Compare Automation 360 and 11.x or 10.x features.  
[Automation 360 feature comparison matrix](#)
4. Review information about packages mapping and variables mapping to understand how 11.x or 10.x commands and variables differ from the equivalent Automation 360 packages and variables.  
[Package mapping for migration](#) | [Variable mapping for migration](#)
5. Use the Bot Scanner to analyze your bots and identify commands and variables used in the bots that are supported for migration in Automation 360.  
[Scan bots using Bot Scanner](#)
6. Analyze the report generated by the Bot Scanner.  
[Analyze reports](#)

[Plan and prepare for migration](#)

## Supported versions for migration

Review the 10.x and 11.x versions that are certified and supported for migration to Automation 360 on Microsoft Windows Server. A *certified* 10.x or 11.x version means that the major functionality of that platform version and the bots developed on it are supported in Automation 360.

Support for more 11.x and 10.x versions will be added over a period of time. Migration from 10.x to Automation 360 Cloud is **not** supported.

**Note:** The 11.x and 10.x versions that are not listed in the following tables are not certified for migration. If you are using a version that is not certified for migration and you want to migrate to Automation 360, you must first upgrade to a version that is certified and then proceed with migration.

## 11.x versions supported for On-Premises and Cloud migration

If you are using any of the following Automation Anywhere Enterprise 11.x versions, you can perform the migration.

11.x versions	Supported for On-Premises migration	Supported for Cloud migration
11.3.5.1	Yes	Yes
11.3.5	Yes	Yes
11.3.4.3	Yes	Yes
11.3.4.2	Yes	Yes
11.3.4.1	Yes	Yes
11.3.4	Yes	Yes
11.3.3.3	Yes	Yes
11.3.3.1	Yes	Yes
11.3.3	Yes	Yes
11.3.2.4	Yes	Yes
11.3.2.2	Yes	Yes
11.3.2.1	Yes	Yes
11.3.2	Yes	Yes
11.3.1.9	Yes	Yes
11.3.1.8	Yes	Yes
11.3.1.7	Yes	Yes
11.3.1.5	Yes	Yes
11.3.1.4	Yes	Yes
11.3.1.1	Yes	Yes
11.3.1	Yes	Yes
11.3	Yes	Yes
11.2.1.5	Yes	No
11.2.1.4	Yes	No
11.2.1.3	Yes	No
11.2.1.2	Yes	No
11.2.1.1	Yes	No

11.x versions	Supported for On-Premises migration	Supported for Cloud migration
11.2	Yes	No

## Database versions supported for 11.x to Cloud migration

Cloud migration is supported for the database versions listed in the following table.

**Important:** Database migration is supported for Control Room databases that are deployed locally. If your databases are deployed in the Cloud, contact your Customer Success Manager (CSM).

Database	Build	File version	Supported operating system
Microsoft SQL Server 2014	12.0.2000.8	2014.120.2000.8	Windows Server 2012 R2 Standard and later
	12.0.6024.0	2014.120.6024.0	
Microsoft SQL Server 2016	13.0.5026.0	2015.131.5026.0	Windows Server 2012 R2 Standard and later
Microsoft SQL Server 2017	14.0.1000.169	2017.140.1000.169	Windows Server 2012 R2 Standard and later
Microsoft SQL Server 2019	15.0.2000.5	2019.150.2000.5	Windows Server 2016 and later

## 10.x versions supported for migration (On-Premises)

If you are on any of the following Automation Anywhere Enterprise 10.x versions, you can migrate to Automation 360 as listed in the following table.

10.x versions to Automation 360 On-Premises
10.7.5
10.5.113
10.5.112
10.5.17
10.5.16
10.5.15
10.5.13
10.5.11
10.5.9
10.5.5
10.5.0
10.3.11

**10.x versions to Automation 360 On-Premises**

10.3.9

10.3.5

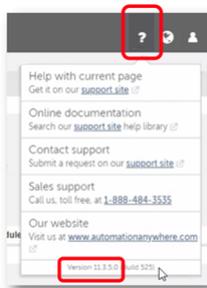
## Verifying your 11.x or 10.x version for migration

Migration to Automation 360 is supported for many certified versions of Enterprise 10 and Enterprise 11. Before you start the migration process, verify your current platform version and then check if that version is currently supported for migration.

### Verify your current platform version

You can find your current platform version in both the Control Room and Enterprise client. Verify your platform version from your Control Room:

1. Log in to your 11.x Control Room.
2. Click the Help icon on the top-right of the Control Room to verify the version number, which is listed at the bottom of the menu.



### Verifying versions supported for migration

After you have verified which 11.x or 10.x version your organization has deployed, check which versions are supported for migration.

1. Go to the following page: [Supported versions for migration](#).
2. Verify if your version is supported for migration.

The supported versions for both Cloud and On-Premises migration are listed on this page.

### Platform version not on supported list

Although we recommend that you begin migration after confirming if your version is supported for migration, you can still run the Bot Scanner to determine which of your bots and their corresponding commands are ready for migration. This will help you plan your migration by learning when currently unsupported bots and commands will be supported in an upcoming release.

## Unsupported features for migration

Review the features that are not supported for migration from 11.x or 10.x to Automation 360.

### Features that are not yet supported

The following features are **not yet supported** for migration:

- The 11.x or 10.x Bot Runner and Bot Creator devices are not included in the migration process and are therefore not migrated to Automation 360.

The Automation 360 Bot agent replaces the 11.x and 10.x Enterprise client. Use the Bot agent to connect a device to the Automation 360 Control Room and run bots on the connected devices.

- Workflows, triggers, version control history of bots, and file system logs
- Migration of 11.x bots that uses Subversion Version Control for version control.
- Control Room that uses Oracle Database.
- Migration of Bot Insight data and other entities such as users, roles, schedules and credential variables when Automation 360 is installed using a fresh database.
- Migration to Automation 360 Cloud-enabled instance.

**Workaround:** You can use the manual process to migrate to a Cloud-enabled instance. See [Prepare for 11.x to Automation 360 Cloud-enabled migration](#).

- Migration of images that are captured using the Object Cloning command.

For such bots, you must recapture the objects after migrating the bots.

- Use of a variable within a variable (except value type variables) in a bot

For example, if a bot contains `$variable1$`, where `$variable1$` contains `$variable2$`, and `$variable2$` contains the actual value, this bot cannot be migrated.

- Use of a fixed value and a variable to specify the index position, for example, `$v_ArrVar(1$RowIndex $,1)$`
- Use of formatted numbers (numbers that use dot or comma as separator) with numeric operators in the If action of the If package
- The capability to capture images from the runtime window when a bot is being executed
- 11.x or 10.x bots that use a string value in a variable that is used in the If command along with '<' or '=' operator are migrated to Automation 360. However, these bots encounter an error when they run in Automation 360.
- The If command or the Loop command that use <, >, <=, or >= operator with variables that contain a string value encounters an error after migration

For example, if you have a bot that contains a variable with the value `abcd` and uses the > operator, the bot encounters an error when it is run after the migration because string type variables are not suppose to use the <, >, <=, or >= operator.

- Object Cloning command that automates the following applications:
  - Flash applications
  - Web application running on Edge-Legacy browser
- 11.x or 10.x bots were able to run a Microsoft Excel macro from the Microsoft Excel file available in the `XLSTART` folder when the that macro is called from another Excel file that does not contain that macro. After migration, these bots are not able to run the macros which are available in another Excel
- The arrow symbol is not displayed in the Automation 360 Bot editor.

When the arrow symbol is used in 11.x or 10.x bots, the Bot editor does not display any symbol after migration, with one exception. The exception is that when the symbol is used in multiple IF/ELSE commands, the Bot editor displays the `$String:FormFeed$` variable instead of the arrow symbol.

## Unsupported features with workaround

You can migrate bots with the following features if you update them based on the specified workaround:

- The **Run Logic** command that uses credential variables as input for a logic of a MetaBot

**Workaround:** Bots that use the **Run Logic** command that passes Credential Vault attributes from a TaskBot to a MetaBot logic can be migrated to Automation 360. The credential name and attribute name are displayed in the fields in the corresponding line of the migrated bot.

If you have migrated using the restored 11.x database, an equivalent locker is created in Automation 360 for the credential variables used in the 11.x bot.

Choose one of the following options to run the migrated bots successfully:

- **Option 1:** Pass the credential type variables.
  1. Create a credential type variable in the child bots as input variables.
  2. In the **Run** action of the Task Bot package of the parent bot, update the input value fields to use the Credential Vault attributes for the credential type variable created for the child bot (corresponding to MetaBot logic).
- **Option 2:** Pass the credential values as a global value.
  1. Create the Global value in Automation 360 for the credentials use in the **Run Logic** command in 11.x.
  2. In the **Run** action of the Task Bot package of the parent bot, update the Input value fields to use the Global values for the credential type variable created for the child bot (corresponding to MetaBot logic).

If you have not used the restored 11.x database when installing Automation 360, you must first create the required locker for the credential variables used in the 11.x bot, before performing the preceding steps.

---

**Note:** Automation 360 provides enhanced security by allowing you to assign Credential Vault attributes only to the credential type variables. This restricts any nonsecure handling of Credential Vault attributes where they might have been assigned to non-credential type variables.

---

- MetaBots that use the same DLL in multiple MetaBot logic might not work as expected after they are migrated to Automation 360.

**Workaround:**

1. Use the **Open** action of the **DLL** package in the migrated parent bot to use the DLL that is used by multiple MetaBot logic in 11.x.
2. Create a session type variable with the **DLL session** option selected from the **Session type** list in the migrated parent bot and all child bots of that parent bot.  
Ensure the **Use as input** option is selected when creating the session variable in the child bots.
3. Use the **Set shared session** action of the **DLL** package in the migrated parent bot and store the session information in the session variable created in the previous step.
4. From the Input values section of the **Run** action of the **Task Bot** package in the parent bot, select the options with the name of the session variables you have created in the child bots and then specify the session variable you have created for the parent bot in these fields.
5. Delete the **Open** and **Close** actions of the **DLL** package from all the equivalent TaskBots of the migrated MetaBot.
6. Select the **Shared session** tab in the **Run function** action in all the equivalent TaskBots of the migrated MetaBot and specify the session variable you have created for that bot.

- If you are migrating to Automation 360 Cloud and you have configured SAML as the authentication type in 11.x, the migration process changes the authentication type to the Control Room database authentication type for the migrated Automation 360 Control Room.

**Workaround:** To configure SAML as the authentication type for the Cloud Control Room after migration, perform these steps:

1. Delete the user that was used to configure SAML in 11.x from Automation 360.
2. Create another user with the required permissions and use that user to configure SAML in Automation 360.

- Migration from 10.x to Automation 360 Cloud.

**Workaround:** Migrate to an 11.x version that is supported for migration to Automation 360 Cloud and then migrate to Automation 360 Cloud.

- 11.x bots that use the Exchange Web Service (EWS) to send email using the Send Email command encounters an error after they are migrated to Automation 360

**Workaround:** Create the following global values in Automation 360 and update the migrated bots to use EWS in all the actions:

- AAE\_EmailSettings\_auth
- AAE\_EmailSettings\_host
- AAE\_EmailSettings\_port
- AE\_EmailSettings\_ssl

The values for these global values must be as specified in 11.x.

- The Loop command or the If command that use date conditions to compare dates in different formats encounters an error after migration

For example, a date with MM/dd/yyyy format does not work with a date with MM/dd/yyyy hh:mm:ss format.

**Workaround:** Update dates with the different format to the same format.

- Number value in a variable that is separated by a comma character

**Workaround:** Remove the comma character from the number values.

- A bot cannot use a variable or an object that contains data larger than 64 KB. For example, if you have captured a table from a website using the Object Cloning command and the captured object contains data larger than 64 KB. Bots containing such objects encounters an error after migration.

**Workaround:** Remove unwanted data or copy the data in a CSV or a text file and uses the **Read** action of the CSV/TXT package.

- Migration fails for action from which the Credential Vault value is missing in the Control Room.

**Workaround:** Create the Credential Vault value in the Automation 360 before migration and start the migration again using the Bot Migration Wizard.

The Bot Scanner reports shows the status of bots that contain unsupported commands and cannot be migrated as N/A. You can migrate such bots by modifying them in your 11.x or 10.x machine as specified in the following table:

Message (truncated)	Description	Action
Migration of bots not yet supported due to child bots using unsupported commands.	A child bot that uses a command that is currently unsupported for migration cannot be migrated. As a result, parent bots that use this child bot also cannot be migrated.	To migrate these parent bots, remove references to the child bot from the parent bot and then migrate that parent bot.  To view the unsupported commands used in the child bots, go to the list of bots that cannot be migrated and click the child bot name.
Migration of "Run Task" with bot path defined using AAAApplicationPath not followed by valid repository folder path is not supported.	11.x or 10.x bot uses an invalid path in the <b>Run Task</b> command of the child bot.	To migrate this bot, modify the 11.x bot to ensure a valid child bot path is provided after AAAApplicationPath.
Migration of MetaBot is not supported. The screen file does not exist.	MetaBot Logic refers to a screen that does not exist in the MetaBot.	To migrate the MetaBot, either add the screen again or remove references to the non-existent screens.
Migration of "Variable Operation" command where variable types do not match is not supported.	11.x or 10.x bot uses the <b>Variable Operation</b> command where the variable types of the variables used are not the same.	Update the <b>Variable Operation</b> command in the 11.x or 10.x bots to ensure that the referenced variables are of the same type.
Migration of "Variable Operation" command where the variable does not exist is not supported.	11.x or 10.x bot references a non-existent variable in the <b>Variable Operation</b> command.	Either create a variable with the same name and type, or remove the command that references the non-existent variable.
Migration of "If" command where the variable does not exist is not supported.	11.x or 10.x bot references a non-existent variable in the <b>If</b> command.	Either create a variable with the same name and type, or remove the command that references the non-existent variable.

Message (truncated)	Description	Action
Migration of "ElseIf" command where the variable does not exist is not supported.	11.x or 10.x bot references a non-existent variable in the <b>Else If</b> command.	Either create a variable with the same name and type, or remove the command that references the non-existent variable.
Migration of "Loop" command where the variable does not exist is not supported.	11.x or 10.x bot references a non-existent variable in the <b>Loop</b> command.	Either create a variable with the same name and type, or remove the command that references the non-existent variable.
Migration of "If - TaskSuccessful" with bot path defined using "AAApplicationPath" not followed by valid repository folder path is not supported.	11.x or 10.x bot uses an invalid path within the <b>If &gt; Task Successful</b> condition of the child bot.	Update the 11.x or 10.x bot to ensure a valid child bot path followed by a proper folder structure is provided after AAApplicationPath.
Migration of "If - TaskUnsuccessful" with bot path defined using "AAApplicationPath" not followed by valid repository folder path is not supported.	11.x or 10.x bot uses an invalid path within the <b>If &gt; Task Unsuccessful</b> condition of the child bot.	Update the 11.x or 10.x bot to ensure a valid child bot path followed by a proper folder structure is provided after AAApplicationPath.
Migration of "ElseIf - TaskSuccessful" with bot path defined using "AAApplicationPath" not followed by valid repository folder path is not supported.	11.x or 10.x bot uses an invalid path within the <b>Else If &gt; Task Successful</b> condition of the child bot.	Update the 11.x or 10.x bot to ensure a valid child bot path followed by a proper folder structure is provided after AAApplicationPath.
Migration of "ElseIf - TaskUnsuccessful" with bot path defined using "AAApplicationPath" not followed by valid repository folder path is not supported.	11.x or 10.x bot uses an invalid path within the <b>Else If &gt; Task Unsuccessful</b> condition of the child bot.	Update the 11.x or 10.x bot to ensure a valid child bot path followed by a proper folder structure is provided after AAApplicationPath.
Migration of "Variable Operation" command resetting system variable "\$WorkItemResult\$" will not be supported.	Resetting the system variable <b>\$WorkItemResult\$</b> is not supported for <b>Variable Operation</b> command.	Use the <b>String &gt; Assign</b> operation and assign an empty string to the <b>\$WorkItemResult\$</b> system variable instead of resetting it.
Migration of "Windows - Close All Open Windows" is not yet supported.	If you have used the <b>Close</b> command with the <b>All open windows</b> option selected in a bot, you cannot migrate that bot.	Update the 11.x or 10.x bot so that it does not use the <b>All open windows</b> option before you migrate it.

Message (truncated)	Description	Action
<p>Migration of "If - ObjectProperties" with field "OCObjectPlay_PropertyInfo_ReviewMessage" of type "String" is not yet supported.</p>	<p>11.x or 10.x bot uses an object in the <b>If &gt; Object Properties</b> command that has one of the properties with size larger than 64 KB.</p>	<p>To migrate this bot, you can perform one of the following actions:</p> <ul style="list-style-type: none"> <li>• Delete the property value that is larger than 64 KB in size, in the <b>If &gt; Object Properties</b> command.</li> <li>• Store the property value which exceeds 64 KB into a text file. Then, create a variable which reads the value from this file. Assign this new variable to the corresponding property in the <b>If &gt; Object Properties</b> command.</li> </ul>
<p>Migration of "ElseIf - ObjectProperties" with field "OCObjectPlay_PropertyInfo_ReviewMessage" of type "String" is not yet supported.</p>	<p>11.x or 10.x bot uses an object in the <b>Else If &gt; Object Properties</b> command that has one of the properties with size larger than 64 KB.</p>	<p>To migrate this bot, you can perform one of the following actions:</p> <ul style="list-style-type: none"> <li>• To migrate this bot, delete the property value that is larger than 64 KB in size, in the <b>Else If &gt; Object Properties</b> command.</li> <li>• Store the property value which exceeds 64 KB into a text file. Then, create a variable which reads the value from this file. Assign this new variable to the corresponding property in the <b>Else If &gt; Object Properties</b> command.</li> </ul>

Message (truncated)	Description	Action
Migration of "Loop.Condition - ObjectProperties" with field "OCObjectPlay_PropertyInfo_ReviewMessage" of type "String" is not yet supported.	11.x or 10.x bot uses an object in the <b>Loop while &gt; Object Properties</b> command that has one of the properties with size larger than 64 KB.	To migrate this bot, you can perform one of the following actions: <ul style="list-style-type: none"> <li>To migrate this bot, delete the property value that is larger than 64 KB in size, in the <b>Loop while &gt; Object Properties</b> command.</li> <li>Store the property value which exceeds 64 KB into a text file. Then, create a variable which reads the value from this file. Assign this new variable to the corresponding property in the <b>Loop while &gt; Object Properties</b> command.</li> </ul>

## Differences in Automation 360 and 11.x/10.x features

Review how some features and functionalities (for example, folder structure, packages, and MetaBots are different in Automation 360 compared with 11.x and 10.x.

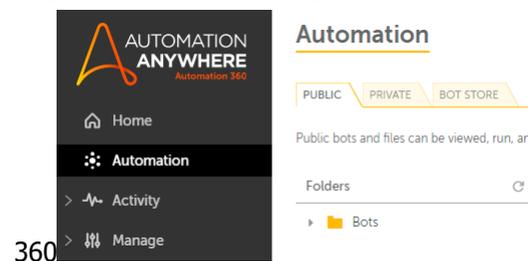
### Folder structure

The folder structure in which bots (TaskBots and MetaBots) are stored in Automation 360 is different compared with 11.x and 10.x.

#### Automation 360 folder structure

The bots (TaskBots and MetaBots) are available in the **Automation > Bots**. Bots that are migrated from 11.x or 10.x are available in the public workspace.

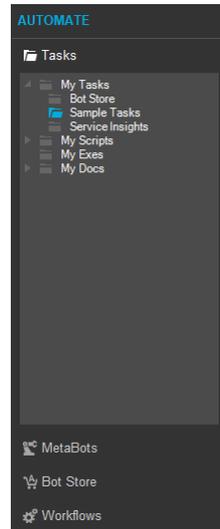
The following image shows the folder structure in Automation



#### 11.x and 10.x folder structure

Bots (TaskBots only) are available in the My Tasks folder (**Automate > Tasks > My Tasks**) and MetaBots are available in the My MetaBots folder.

The following image shows the folder structure in 11.x:



## Packages

For most of the 11.x or 10.x commands, similar or equivalent actions and packages are available in Automation 360. The behavior of some of the 11.x or 10.x commands is different compared with Automation 360.

*[Package mapping for migration](#)*

## Variables

For most of the 11.x or 10.x user, system, and credential variables, similar or equivalent system variables are available in Automation 360. The behavior of some of the 11.x or 10.x variables is different compared with Automation 360.

*[Variable mapping for migration](#)*

## MetaBots

MetaBots are not available in Automation 360. When you migrate 11.x or 10.x MetaBots, they are migrated to equivalent TaskBots in Automation 360. These TaskBots provide similar output and capabilities of the MetaBots.

*[How MetaBots are migrated](#)*

## Bot Scanner overview

The Bot Scanner analyzes the bots (TaskBots and MetaBots) created in your 10.x or 11.x Control Room. The scanner generates a report summarizing the number of bots, commands, and variables that ready for migration and those not yet supported for migration, and provides a recommendation on whether you are ready for migration.

---

**Note:** A new version of Bot Scanner is released with each Automation 360 release. Use the latest Bot Scanner version to monitor the commands and variables that are supported for migration in Automation

360 with each update. The scanner obtains information about the Automation Anywhere components used by customers and prioritizes support for these components for migration.

---

## Considerations for using Bot Scanner

- Ensure that you are on the supported 10.x or 11.x Control Room version for migration before you scan your bots.  
*Supported versions for migration*
- You do not have to install Automation 360 to run the Bot Scanner, but access to your 10.x or 11.x repository is a requirement.
- **Recommended:** Run the Bot Scanner before performing any migration steps.

## How Bot Scanner works

The Bot Scanner reads the contents of your 10.x or 11.x and provides a summary report for your analysis. The scanner provides a recommendation on whether or not to migrate now and an estimated time of availability (ETA) on when unsupported commands will be supported in Automation 360.

The Bot Scanner does not migrate bots or perform any other action. If you are not ready for migration, the Bot Scanner identifies the reasons why the bots cannot be migrated.

The bots (.atmx and .mbot files) are scanned at the location you specify and the summary report provides the following information:

- The number of bots scanned
- The number of bots that can and cannot be migrated to Automation 360
- The commands and variables that are used in the scanned bots and supported in Automation 360
- The commands that are migrated to Automation 360 with some modifications that have to be reviewed

---

**Note:** The Bot Scanner generates the summary report in HTML format and a separate report for each bot in XML format.

---

## Bot Scanner reports

The Bot Scanner generates the following reports to help you decide whether you should start the migration.

### **Proceed with migration**

This report is generated when **90% or more than 90%** of your bots can be migrated. As the majority of your bots are ready for migration, you are eligible for migration. You might have to perform some work before or after migration to migrate some of the remaining bots.

### **Wait to migrate**

This report is generated when **less than 90%** of your bots can be migrated. In this case, you must run the Bot Scanner again in the next release to assess your eligibility for migration.

## Sharing Bot Scanner report to improve experience

You can help improve the experience of migration to Automation 360 by sharing the reports generated by the Bot Scanner. These reports help our engineering team focus on supporting the components that are more frequently used by our customers.

---

**Important:** We maintain the privacy of the shared reports. No personally identifiable information (PII) is included and you can review the reports before sharing. Contact your Customer Success Manager (CSM) or Partner Enablement Manager (PEM) for more details.

---

Watch the following video to understand how the Bot Scanner analyzes your bots and determines your migration readiness from 11.x or 10.x to Automation 360.

## Scan bots using Bot Scanner

Before you migrate to Automation 360, it is important to verify the migration readiness of your bots. Scan the bots using Bot Scanner and analyze the generated report for information about the commands and variables used in these bots and how many of these commands and variables are supported for migration.

Ensure you meet the system requirements for using the Bot Scanner:

- **Hardware requirements**

<b>Processor</b>	2.66 GHz or higher (64-bit)
<b>RAM</b>	2 GB or higher
<b>Disc space</b>	200 MB

- **Software requirements**

**Operating systems:** Windows 7 or later (32-bit and 64-bit)

1. Download the latest version of Bot Scanner from the Automation Anywhere Support site.
  - a) Navigate to the [A-People Downloads page \(Login required\)](#).
  - b) Click the `Automation Anywhere Enterprise A2019.xx <Build_number>` link. The `xx` in the link refers to the release number. For example, Enterprise A2019.19.
  - c) Click the `Installation Setup` folder.
  - d) Click the `AAE Bot Scanner` zip file, and then click **Download** on the toolbar.
2. Extract the files from the zip file you have downloaded and double-click `AAE_Bot_Scanner.exe`.

---

**Note:** Ensure that you save the `AAE_Bot_Scanner.exe` file in a location path that does not contain a double-byte character. Otherwise, the Bot Scanner encounters an error when it is run.

---

3. In the **Automation Anywhere Bot Scanner** dialog box, enter the location of the folder that contains the bots that you want to analyze in the **Select repository path** field.

---

**Important:** You must create a copy of the Control Room repository and provide the location of the copied folder instead of the actual repository folder.

---

- a) Copy the Control Room repository.

For example, if the current location of the repository is `C:\ProgramData\AutomationAnywhere\Server Files\Default\Automation Anywhere`, you must copy the `Automation Anywhere` folder.

- b) Paste the copied repository at a temporary location. For example, `D:\My Bots` folder.

You must provide this location (`D:\My Bots`) in the **Select repository path** field in Step 3.

4. Enter the location where you want to save the generated report in the **Select destination folder** field.

---

**Note:** The Bot Scanner related files and folders in the destination folder are overwritten if you have specified the same location when you have used the Bot Scanner previously.

---

5. Enter a value in the **Timeout** field to specify the maximum time the Bot Scanner should take to analyze a bot.

If the scanning of a bot takes more than the value specified in the **Timeout** field, Bot Scanner stops scanning that bot and proceeds to scanning other bots in the repository.

6. Click **Create report**.

The Bot Scanner starts analyzing the bots available in the repository.

The Bot Scanner displays an error if it scans a bot that is created using an unsupported version of Enterprise client. You must upgrade the bot to a supported version of Enterprise client and scan the bot again.

7. Optional: You can click **Stop scanning** when the Bot Scanner is analyzing the bots to cancel the operation.

The summary report and individual reports are available for the bots that were analyzed before the operation was canceled.

8. Click **Open report** to open the summary report in the default browser after the Bot Scanner has completed analyzing all the bots available in the repository.

### [Analyze reports](#)

#### **Related concepts**

##### [Bot Scanner overview](#)

The Bot Scanner analyzes the bots (TaskBots and MetaBots) created in your 10.x or 11.x Control Room. The scanner generates a report summarizing the number of bots, commands, and variables that ready for migration and those not yet supported for migration, and provides a recommendation on whether you are ready for migration.

#### **Related reference**

##### [Analyze reports](#)

You can analyze the report generated by the Bot Scanner to get information about the bots (TaskBots and MetaBots) that can be migrated.

## Analyze reports

You can analyze the report generated by the Bot Scanner to get information about the bots (TaskBots and MetaBots) that can be migrated.

The Bot Scanner provides the following key information about the bots:

- Number of bots analyzed
- Number and percentage of bots you can and cannot migrate to Automation 360
- Commands and variables that are used in the bots and the frequency of usage
- Reasons why bots cannot be currently migrated and frequency of such occurrences
- Actions required by the users post migration due to change in the behavior of the commands

---

**Important:** Automation 360 is updated frequently in order to achieve 100% functional equivalency with 10.x or 11.x versions. The percentage of bots, commands and variables that are supported for migration in Automation 360 will increase until it reaches 100% over the next upcoming releases. That is, for every function you do in 10.x or 11.x, an equivalent capability is in Automation 360.

Most of the 10.x or 11.x features are available as is; however, some features are implemented differently to support web (without a client) operations. For these features, you have to change the way bots are written.

---

The Bot Scanner is designed to scan bots (TaskBots and MetaBots) created using both 10.x and 11.x versions of Enterprise client. The total file count includes the number of files that were skipped and not scanned.

The reports are available at the output location you specified in the **Select destination folder** field in the **Automation Anywhere Bot Scanner** dialog box. The Bot Scanner generates a summary report and a separate report for each bot that it scanned. It creates a separate report for each logic available in a MetaBot.

A `raw-data` folder is created that contains the reports (in XML format) for each bot scanned. It helps our engineers to further analyze the migration process and take corrective actions, if required. No personally identifiable information (PII) is included in the summary report or the individual reports of the scanned bots.

If you choose to share the reports with us to help improve the product, compress the files in the `raw-data` folder and coordinate with your Customer Success Manager (CSM) or Partner Enablement Manager (PEM). No data is automatically shared with Automation Anywhere.

The system creates four folders within the `raw-data` folder that contain various reports:

- `Migratable_Bots`: Contains reports of the bots that can be migrated to Automation 360.
- `Non_Migratable_Bots`: Contains reports of the bots that cannot be migrated to Automation 360.
- `Failed_to_Analyze`: Contains reports of the bots that Bot Scanner failed to analyze.
- `MetaBots`: Contains reports of the MetaBots that can and cannot be migrated to Automation 360 and the ones that the Bot Scanner failed to analyze.

## Summary report for all bots

Summary report provides information about whether you can migrate to Automation 360, the total number of bots scanned and the bots supported for migration to Automation 360 (in percentage).

For example, consider the Bot Scanner has scanned 10 bots. Of the 10 bots, if 8 bots are ready for migration to Automation 360, then percentage of bots that can be migrated is 80%.

Identify if the bots can or cannot be migrated to the Automation 360 by viewing the information in each tab:

- [Bots that can be migrated now](#)
- [Bots that cannot be migrated now](#)

### **Bots that can be migrated now**

View the number and percentage of bots that can be migrated to Automation 360 at this time.

You can review the bots and the associated commands:

- **Bots**

Lists the bots that can be migrated and actions you might must perform after migration. You can also identify whether or not a review is required for these bots that can be migrated. Click the following tabs to find the details:

Option	Action
Review required	<p>Lists the bots that can be migrated and should be reviewed in case they have to be modified due to any change in the Automation 360 product behavior compared to the 11.x or 10.x version.</p> <p>Download the CSV file to review the list of bots offline or to share the list with others such as your department.</p> <p>View the information in the following tabs:</p> <ul style="list-style-type: none"> <li>• <b>Bots</b> <ul style="list-style-type: none"> <li>• View the list of bots that contain commands that require a review. View information such as the name of the bot, its location, and the number of parent bots that are using this bot as a child bot.</li> <li>• Click a bot name to view the commands the bot contains, any message about the change in behavior of the command, and the frequency (the number of times the command is used in the bot). Download the command list as an XML file to review the file offline.</li> </ul> </li> <li>• <b>Messages</b> <ul style="list-style-type: none"> <li>• View the review messages about the change in behavior of a command. View information such as number of bots that are affected by the change in behavior of the command for which the message is displayed and the number of times that command is used in these bots.</li> <li>• Click a review message to view the associated bots that contain the commands, location of the bots, and the line numbers where the command is used in each bot.</li> </ul> </li> </ul>
No review required	<p>Lists the bots that do not require any action and can be migrated to Automation 360. Download the list of bots that can be migrated as a CSV file to review the file offline or share the file with others such as your department. Click any bot in this list to view the XML report offline.</p>

- **Commands**

Lists the commands that can be migrated and the number of times the commands are used across all your scanned bots. Download the list of commands that can be migrated as a CSV file to review the file offline or share it with others such as your department.

### **Bots that cannot be migrated now**

View the number and percentage of bots that cannot be migrated to Automation 360 at this time.

You can review the bots and the associated commands:

- **Bots**

- Lists the bots that cannot be migrated to Automation 360. View information such as the bot name, its location, the error message or information about how to view the error message, and how frequently this bot is used as a child bot.

---

**Note:** You cannot migrate the parent bot if any of the child bot cannot be migrated. Similarly, a MetaBot is not migrated if any of the logic available in that MetaBot cannot be migrated to Automation 360.

---

- Download the list of not bots that cannot be migrated as a CSV file for sharing with others such as your department.
- Click any of these bots to view specific details or error messages about bot migration, such as the details of commands that are blocking the migration of a particular bot and the line number where the command is located in the bot. Download the command list as an XML file to review it offline.

- **Commands**

- Lists the commands and system variables that cannot be migrated to Automation 360. View information such as the number of parent bots affected due to unsupported commands or variables used in the child bots, the frequency with which the command or system variable is used in all your scanned bots, and the upcoming release in which the respective command or variable will be available for migration.

---

**Note:** Bots containing commands with an N/A status cannot be migrated. However, you can modify the source bots and then migrate them: [Bot scanner command reports with N/A status](#).

---

- Download the list of commands that cannot be migrated as a CSV file to review it offline or share it with others such as your department.
- Click any of the messages in this list to view the affected bots that used the impacted command or variable and the location of the corresponding affected bots. Click each bot in this list to view the XML report offline.

The report is valid until the next version of Bot Scanner is available. When the next version of Bot Scanner is available, a report expiry message is displayed. You must download the latest version of Bot Scanner and scan the bots again.

### Verifications and actions required after migration

Some commands in the bots might be marked as review required in the Bot Scanner report. For these items, you need perform certain validation or update the bots after they are migrated.

The following Bot Scanner messages require verification or some actions:

- Child bot path is completely variablized and is resolved at runtime. Bot would fail upon execution if the path specified in the variable is not valid. Please review the migrate bot.

Ensure that the child bot is available at the location specified in the variablized path. If the path in the parent bot is not correct, update the path to point to the correct child bot.

- Value returned by system variable "Error Description" might be different w.r.t. legacy versions. Please review the migrated bot.

Description of some of the error messages in Automation 360 might be different than 11.x or 10.x for the same error. If an 11.x or 10.x bot is configured to take decisions based on the description of the error messages, you might have to update the migrated bot based on the new description of error messages.

- Migration of "Database - Connect" command is completed but additional configuration required for "Windows authentication". Please refer the database package documentation for more details.

Complete the steps specified to connect to a Microsoft SQL Server with Windows authentication.

*Connect to Microsoft SQL Server with Windows authentication*

- Migration of "IF" with variable condition is completed. However, could not determine the date format of the user variable, hence migrated with default date format mm/dd/yyyy HH:mm:ss. Please review and change the format if required.

Update the date format in the migrated bot to the same format used in 11.x for that bot.

- Could not determine if a variable used as position is index or column name. Index position starts from 0 instead of 1 hence take necessary actions if needed.

If you have used the FileData Column[\$variable\$] or Excel Column[\$variable\$] system variables in the 11.x or 10.x bot, we assume that you have used the column name in the \$variable\$. In such cases, the migrated bot contains the FileData Column{\$variable\$} expression. If the \$variable\$ in the 11.x or 10.x bot contains the column number, you must update the expression in the migrated bot to FileDataColumn[\$var.String:toNumber()\$].

- The Run Logic command that uses credential variables as input for a logic of a MetaBot

Bots that use the **Run Logic** command that passes Credential Vault attributes from a TaskBot to a MetaBot logic can be migrated to Automation 360. The credential name and attribute name are displayed in the fields in the corresponding line of the migrated bot.

If you have migrated using the restored 11.x database, an equivalent locker is created in Automation 360 for the credential variables used in the 11.x bot.

Choose one of the following options to run the migrated bots successfully:

- **Option 1:** Pass the credential type variables.
  1. Create a credential type variable in the child bots as input variables.
  2. In the **Run** action of the Task Bot package of the parent bot, update the input value fields to use the Credential Vault attributes for the credential type variable created for the child bot (corresponding to MetaBot logic).
- **Option 2:** Pass the credential values as a global value.
  1. Create the Global value in Automation 360 for the credentials use in the **Run Logic** command in 11.x.
  2. In the **Run** action of the Task Bot package of the parent bot, update the Input value fields to use the Global values for the credential type variable created for the child bot (corresponding to MetaBot logic).

If you have not used the restored 11.x database when installing Automation 360, you must first create the required locker for the credential variables used in the 11.x bot, before performing the preceding steps.

---

**Note:** Automation 360 provides enhanced security by allowing you to assign Credential Vault attributes only to the credential type variables. This restricts any nonsecure handling of Credential Vault attributes where they might have been assigned to non-credential type variables.

---

## Report for an individual bot

The report for each bot provides information about its dependencies, variables, and commands used.

The individual bot report looks similar to the following code:

```
<analysis version="1.3.0">
  <stat>
    <dependencies ucount="0" count="0"/>
    <errors ucount="6" count="12">
      <error count="1">System variable $AAApplicationPath
$</error>
      <error count="1">Command [If FolderNotExist]
is not supported</error>
      <error count="3">System variable $CurrentDirectory
$</error>
      <error count="3">System variable $Extension$</error>
    </errors>
  </stat>
</commands>
```

```

line="1"      <command target-action="assign" name="VariableOperation"
              grp="VariableOperation" api="VarOpe">
              <msg type="error" review="true"
category="variable">System
              variable $AAApplicationPath$</msg>
              <msg type="info" review="false"
category="default">Command
              parameter [Option] of type [String] is not
required.</msg>
              </command>
              <command target-action="createFolder"
name="createFolder" line="3"
              grp="FilesFolders" api="CreateFolder"/>
              <command target-action="copyFiles" name="CopyFiles"
line="5"
              grp="FilesFolders" api="CreateFolder"/>
              <command target-action="connect" name="Connect"
line="3"
              grp="Database" api="Connect"/>
              <command target-action="OpenCSVTXT" name="ReadFrom"
line="9"
              grp="CsvText" api="Csv"
              <msg type="info" review="false"
category="command">Line
              in 11.x client, there is no separate option given
for CSV
              and TEXT in Automation 360</msg>
              <msg type="error" review="true"
category="variable">System
              variable $CurrentDirectory$</msg>
              <msg type="error" review="true"
category="variable">System
              variable $Extension$</msg>
              <msg type="error" review="true"
category="variable">System
              variable $FileName$</msg>
              </command>
              </commands>
              <variables>
              <variable name="$CSV-TXT-Default-DATA$"
              type="TABLE" value-type=""/>
              </variables>
</analysis>

```

The following table describes the various attributes available in the XML report shown in the previous image:

Node	Attribute	Description
Stat	--	Provides information about the number of dependencies, error, and warnings.
--	dependencies	Specifies the number of dependencies for the bot. The <code>ucount</code> indicates the number of unique dependencies and the <code>count</code> indicates the total number of dependencies.
--	error	Specifies the number of errors for the bot. The <code>ucount</code> indicates the number of unique errors and the <code>count</code> indicates the total number of errors.

Node	Attribute	Description
Command	--	Provides information about the various commands and actions used in the bot.
--	command target-action	Specifies the action being performed for the command.
--	name	Specifies the name of the command.
--	line	Specifies the line number where the command is available in the bot.
--	grp	Specifies the command group the command belongs to.
--	api	Specifies the name of the API the command uses.
--	msg type	Provides information about the message type. The <code>error</code> type indicates that the command cannot be migrated to Automation 360, and an <code>info</code> type indicates that the command can be migrated but some of its attributes will be changed during migration.
--	review	Provides information about whether the command has to be reviewed.  This attribute is always true for <code>error</code> type messages, which indicates that migration of that command to Automation 360 is not yet supported. For <code>info</code> type messages, if the attribute is true, you must review the value in the <code>category</code> attribute. You can decide whether you want to take any action on the migrated bot based on the value available in the <code>category</code> attribute.
--	category	Provides information about the command or variable for which the message is displayed.
Variables		Provides information about the system variables used by the bot.
--	variable name	Specifies the name of the variable.
--	type	Specifies the type of variable.
--	value type	Specifies the type of value provided for that variable.

## Plan and prepare for migration

Perform the tasks in this workflow to prepare your Automation 360 environment for migration.

Ensure that you have completed all the tasks to check your readiness for migration: [Check migration readiness](#).

1. [Choose a deployment model \(Cloud, Cloud-enabled, or On-Premises\)](#).
2. [Request and activate your migration license](#).

3. Based on the deployment model you have selected, prepare your environment for migration:

Deployment model	Actions
<b>Cloud</b>	<ul style="list-style-type: none"> <li>• Migrate using the Cloud Migration Utility: <i>Prepare for 11.x to Automation 360 Cloud migration</i></li> <li>• Use both Automation 360 Cloud and 11.x in parallel: <i>Prepare for migration when using 11.x and Automation 360 Cloud in parallel</i></li> <li>• Manually migrate to Cloud: <i>Prepare to manually migrate to Automation 360 Cloud</i></li> </ul>
<b>Cloud-enabled</b>	<ul style="list-style-type: none"> <li>• <i>Prepare for 11.x to Automation 360 Cloud-enabled migration</i></li> </ul>
<b>On-Premises</b>	<ul style="list-style-type: none"> <li>• <b>11.x to Automation 360:</b> <ul style="list-style-type: none"> <li>• <i>Prepare for 11.x to Automation 360 On-Premises migration</i></li> <li>• Use both Automation 360 On-Premises and 11.x in parallel: <i>Prepare for migration when using 11.x and Automation 360 On-Premises in parallel</i></li> </ul> </li> <li>• <b>10.x to Automation 360:</b> <ul style="list-style-type: none"> <li>• <i>Prepare for 10.x to Automation 360 On-Premises migration</i></li> <li>• Use both Automation 360 On-Premises and 10.x in parallel: <i>Prepare for migration when using 10.x and Automation 360 On-Premises in parallel</i></li> </ul> </li> </ul>

4. *Complete the pre-migration tasks.*

*Migrate and validate bots*

## Choose deployment model

The Automation 360 platform is developed on a cloud-native architecture with a single codebase that supports both Cloud and On-Premises deployments. The experience of all the components is the same whether the platform is deployed on Cloud or On-Premises on your own infrastructure, which could be physical servers, your private Cloud, or a public Cloud.

Migration is available in Automation 360 starting from Build 2079 for On-Premises and from Build 7554 for Cloud deployments.

### Deployment models

Automation 360 provides the following deployment models:

**Cloud**

Fully hosted and managed in Automation Anywhere Cloud. This deployment model provides full SaaS

experience with instant access to a complete platform that is secure, always up-to-date, and requires zero infrastructure.

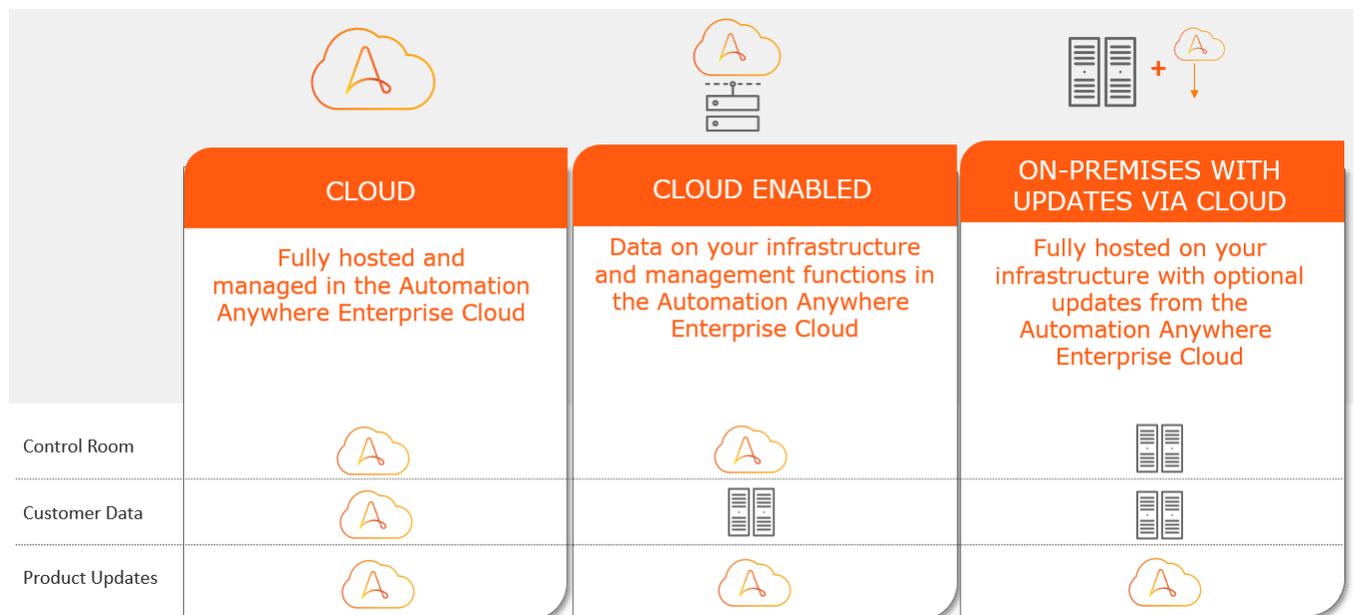
### Cloud-enabled

Offers a SaaS experience while data is hosted On-Premises with lower total cost of ownership (TCO). This deployment model is suitable for customers who have to adhere to strict regulatory norms where data sovereignty is mandatory.

### On-Premises with updates through Cloud

With Automation Anywhere On-Premises with updates through Cloud service, all business, personal, and operational data is kept on and deployed from the server on-premises on the customer network.

The following image shows the deployment models for Automation 360:



See also [Cloud operational responsibilities](#).

## Getting ready for Automation 360 on Automation Anywhere Cloud

When you choose the Automation Anywhere Cloud deployment, there is no additional physical server infrastructure to set up for the Control Room. Once you have completed your upgrade, you will benefit from automatic updates across your organization and scale easily in the Cloud. As you get started with Automation 360 on the Automation Anywhere Cloud, following are the system and compatibility requirements for running Automation 360:

- **Bot agent compatibility requirements:** Bot agent must be installed on registered devices so users can build and run bots on them.

## Getting ready for Automation 360 On-Premises (customer's infrastructure)

Install and maintain Automation 360 on your own infrastructure. Once you have completed your upgrade, you will benefit from regular updates with new release builds made easily available to download and install. Following are the system and setup details for Automation 360 On-Premises:

- *Bot agent compatibility requirements*: Bot agent must be installed on registered devices so users can build and run bots on them.
- *System requirements*: Hardware and data center requirements, including server, database, ports, protocols, and more.

## Getting ready for Automation 360 Cloud-enabled

When you choose the Cloud-enabled deployment, two instances of Control Room are required: one deployed on Automation Anywhere Cloud and another installed on your own infrastructure. The Control Room deployed on Automation Anywhere Cloud manages the operational services and the Control Room installed on your infrastructure manages your business and operational data.

- *Bot agent compatibility requirements*: Bot agent must be installed on registered devices so users can build and run bots on them.
- *System requirements*: Hardware and data center requirements, including server, database, ports, protocols, and more.

## Get migration license

Migration is offered for free. To migrate to an Automation 360 environment (Cloud or On-Premises), you must request a migration license.

### License terms and duration

- Migration licenses are commissioned for 90 days.
- If your migration is taking longer than expected to complete, contact your Customer Success Manager or Account Representative to discuss extensions.
- Your Automation 360 migration license is transitional, which means it will overlap with your Enterprise 10 or Enterprise 11 license during the migration period.

After you have completed your migration, your Automation 360 products and licenses will transfer over to the 1-to-1 equivalents of your current contract. You should review your automation requirements or renewal dates and determine if any updates in licensing are necessary.

---

**Note:** Run the Bot Scanner and determine when to migrate first. We recommend that you request a migration license only after you have run the Bot Scanner and have reviewed the prerequisites for your deployment choice.

---

### Requesting your migration license

When you are ready to begin migration, contact your Account Representative, submit your Bot Scanner report, and specify if you are requesting licenses for an Automation 360 Cloud or On-Premises deployment.

- To get started with Automation 360 (Cloud or On-Premises), you will be required to accept the in-product user terms.
- Because Automation Anywhere will be hosting customer data, customers migrating to Automation 360 Cloud must also agree to the Cloud Automation Agreement.

## Activating the license

- **Automation 360 Cloud:** You will be provided with a migration code that includes your migration license. Paste this code into the Cloud Migration Utility, and then run the utility to activate your license.
- **Automation 360 On-Premises:** When you complete your Automation 360 installation, upload your license file when you open the Automation 360 Control Room.

## Prepare for 11.x to Automation 360 Cloud migration

Perform the tasks in this workflow to migrate from Automation Anywhere Enterprise 11.x to Automation 360 Cloud, including migrating your bots.

Ensure you have procured and activated your migration license.

[Get migration license](#)

### Cloud Migration Utility

Use this utility to upload data from an existing 11.3.x Control Room to a new Control Room environment on Automation Anywhere Cloud. The data migrated includes all the data for users, roles, Credential Vault, WLM queues, Control Room settings, schedules, bots, and dependency files (for example, spreadsheets).

---

### Important:

- Migration is performed to a new Cloud Control Room, which will be provisioned during the migration. You cannot reuse an existing Cloud Control Room for the migration.
- Logs and Bot Insight dashboard data are excluded from the upload to the new Cloud Control Room.
- Migrating data from standard Microsoft SQL database deployments is supported. See [Database versions supported for 11.x to Cloud migration](#).

---

For IQ Bot migration, see [Migrate from Automation 360 IQ Bot On-Premises to Cloud](#).

1. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.
2. Download and install the Cloud Migration Utility.  
[Install Cloud Migration Utility](#)
3. Use the utility to upload 11.x data to Automation Anywhere Cloud.  
[Upload 11.x data using Cloud Migration Utility](#)

[Prerequisite tasks for migrating bots](#)

## Install Cloud Migration Utility

Install the Cloud Migration Utility, which enables you to upload 11.x data to Automation Anywhere Cloud.

Consider the following recommendations:

- Install the Cloud Migration Utility on the device on which the 11.x Control Room is installed.
  - If you installed 11.x in cluster mode, install the migration utility on one of the nodes of the cluster.
  - Ensure a minimum of 2 GB hard disk space on the device on which you want to install the migration utility.
1. Download the Cloud Migration Utility from the Automation Anywhere support site: [A-People Downloads page \(Login required\)](#).
    - a) In the Automation Anywhere Automation 360 section, click the **AAE Cloud Migration Utility** link.
    - b) Download the .zip file.
  2. Extract the .zip file and run the AAE Cloud Migration Utility.exe file as administrator.
  3. Select the language in which you want to install the utility and click **OK**.
  4. On the **Requirement** screen, click **Install**.  
The screen lists the applications that are required to install the utility on the machine. The utility installs the required applications; no separate installation is required.
  5. On the **Welcome** screen, click **Next**.
  6. On the **License Agreement** screen, read and accept the license, and click **Next**.
  7. On the **Destination Folder** screen, click **Change** if you want to change the location where you want to install the utility, and click **Next**.
  8. On the **Ready to Install the Program** screen, click **Install**.  
The **Installing AAE Cloud Migration Utility** screen displays the progress of the installation.
  9. On the **Completed** screen, click **Finish**.

#### *Upload 11.x data using Cloud Migration Utility*

## Prerequisites for Cloud migration

After you have installed the Cloud migration utility, you must perform certain tasks before you start uploading data to Automation 360.

Complete the following requirements before you run the Cloud Migration Utility to upload data to Automation 360 Cloud:

- Install the Cloud Migration Utility.
- [Install Cloud Migration Utility](#)
- Ensure you have received an email that contains a migration code. Contact your sales representative to receive the code.

The migration code is valid for one Control Room only. If you have multiple Control Room, you will receive equivalent number of migration codes. Ensure that you use the correct migration code for migration of a particular Control Room.

---

**Important:** The migration code you receive through email is valid for 30 days from the date it is generated and shared with you. So start the migration before the code expires. Otherwise, you will have to request a new code, which might take a significant amount of time.

---

- The port that is used to connect to the 11.x Control Room database must be open and available for the utility.

- The firewall must be configured to allow the utility to connect to the following for outbound HTTPS traffic over the port 443:
  - <https://aa-provsvc.globalservices.automationanywhere.digital/>
  - <https://aws.amazon.com>
- Ensure a stable internet connection with sufficient bandwidth to upload the data within 60 minutes. If the upload time exceeds 60 minutes, the Cloud Migration Utility will timeout and you need to start the upload process again.
- We recommend you to plan for the downtime for 11.x Control Room when you use the migration utility.

The downtime is required to ensure that no data is missed when the Cloud Migration Utility is packaging 11.x data for upload. If downtime is not possible, ensure no user activities are performed on the 11.x Control Room for the time period when the Cloud Migration Utility is uploading data.
- Grant access to the `C:\ProgramData\AutomationAnywhere` folder for the migration utility to store the log files.
- Ensure that the Credential Vault mode is set to express mode.

This is to ensure that the credentials and variables available within the 11.x Credential Vault are migrated to the Cloud Control Room. If the Credential Vault mode is set to manual mode in 11.x, the credentials and variables available in the 11.x Credential Vault are not migrated to the Cloud Control Room.

You can change the mode back to manual after the Control Room data is migrated. See [Configure Credential Vault Connection mode](#).
- If the migration utility is not installed on the device on which the 11.x Control Room is installed, access to the 11.x repository, Control Room database, and the Control Room installation path must be provided.

## Upload 11.x data using Cloud Migration Utility

Use the Cloud Migration Utility to gather 11.x data and upload it to Automation Anywhere Cloud.

Ensure you have completed all the prerequisites before you start uploading data to Automation 360. See [Prerequisites for Cloud migration](#).

---

**Recommendation:** Stop the Automation Anywhere Control Room Reverse Proxy service.

If 11.x is installed in a cluster setup, you must stop the Automation Anywhere Control Room Reverse Proxy service on all the nodes in the cluster.

---

1. Run the Cloud Migration Utility as administrator.
2. Select the **Connect to the internet via proxy** option if you want to connect to the internet using a proxy server, and then click **Get started**.
  - a) Specify the hostname or IP address of the proxy server in the **Proxy hostname/IP address** field.
  - b) Specify the port you want to use to connect to the proxy server in the **Port** field.
  - c) Select the **Authentication** option if the proxy server requires authentication.
  - d) Specify the credentials you want to use for authentication in the **Username** and **Password** fields.

- On the **Connect to Control Room** screen, enter the following details about the 11.x environment.

**Important:** If you are running the utility on the same machine on which the Control Room is installed, these fields are automatically populated with the values.

Field	Enter this value
<b>Installation Path</b>	Location where the Control Room is installed.
<b>Repository Path</b>	Location where the Control Room repository is stored.
<b>Server type</b>	Database server type used for 11.x
<b>IP address</b>	IP address or hostname of the database server.
<b>Port</b>	Port that is used to connect to the database server.
<b>Database Name</b>	Name of the Control Room database that you want to upload.
<b>Secure Connection</b>	Option to use a secure connection to connect with the database.
<b>Authentication</b>	<p>Authentication method you want to use:</p> <ul style="list-style-type: none"> <li><b>Windows authentication:</b> Select this option to use Windows authentication for establishing a connection with the database server.</li> <li><b>SQL authentication:</b> Select this option to use database credentials for authentication when establishing a connection with the database server.</li> </ul> <p>If you select this option, provide the credentials you want to use to connect to the database server in the <b>Username</b> and <b>Password</b> fields.</p>
<b>Backup Path</b>	Location where you want to store backup of the 11.x Control Room data.

- Click **Next**.
- On the **Summary** screen, click **Next**.
- On the **Validate migration code** screen, enter the migration code you received through email and click **Validate**.  
The system validates the migration code you have entered.
- Click **Next**.  
The system extracts the 11.x data and starts transferring data to Automation Anywhere Cloud.
- Click **Exit**.  
After the data is successfully uploaded, you will receive an email with a link and login credentials to access the Control Room.

*Migrate Enterprise bots*

## Prepare for migration when using 11.x and Automation 360 Cloud in parallel

Perform the tasks in this workflow if you want to use both Automation 360 Cloud and 11.x in parallel. You can continue to use both environments till the time you are ready to start the migration from 11.x to Automation 360 Cloud.

Ensure you have procured and activated your migration license.

[Get migration license](#)

---

### Important:

- Migration is performed to a new Cloud Control Room, which will be provisioned during the migration. You cannot reuse an existing Cloud Control Room for the migration.
- You cannot use the Cloud Migration Utility to upload your data to the Cloud Control Room if you have selected the standard Automation 360 Cloud SKUs when you signed the order form.

If you want to use the Cloud Migration Utility, you must have selected the Automation 360 Cloud migration SKUs when you signed the order form.

- 
1. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.
  2. Download and install the Cloud migration utility.

[Install Cloud Migration Utility](#)

3. Use the Cloud migration utility to upload 11.x data to Automation Anywhere Cloud.

[Upload 11.x data using Cloud Migration Utility](#)

4. Continue using both 11.x and Automation 360 environments in parallel.

---

**Recommendation:** Create all new bots and entities such as users, roles, and schedules in Automation 360.

5. If you create any new entity such as users, roles, or schedules (except bots) in 11.x after installing Automation 360, create the same entity in Automation 360.
6. When you are ready to use only Automation 360 as your production environment:
  - a) If you have created new bots in 11.x data is uploaded in Automation 360 Cloud:
    1. Export all the bots and their dependencies that were created after data was uploaded in Automation 360 Cloud using Bot Lifecycle Management.

[Export bots](#)

2. Import all the bots to Automation 360 using Bot Lifecycle Management.

[Import bots](#)

[Prerequisite tasks for migrating bots](#)

## Prepare to manually migrate to Automation 360 Cloud

You can manually migrate from 11.x or 10.x to Automation 360 Cloud (without using the Cloud Migration Utility) by creating users, roles, permissions, and other entities required by the migrated bots to run successfully.

Ensure you have procured and activated your migration license: [Get migration license](#).

**Recommended:** Use the manual migration in the following scenarios:

- You have an existing Automation 360 Cloud instance and want to migrate your 11.x data.
- When you want to migrate only bots and re-create all other 11.x or 10.x entities such as users, roles, and credentials manually in Automation 360.
- When you want to migrate only a few of the 11.x or 10.x entities. For example, if you have 50 users and 10 user-defined roles in 11.x or 10.x and you want to migrate only 40 users and 7 roles to Automation 360. Similarly, if you want to migrate only users and roles and want to re-create the required schedules in Automation 360.

For information about automated migration to Cloud (using the Cloud Migration Utility), see [Prepare for 11.x to Automation 360 Cloud migration](#).

1. Create all the 11.x or 10.x entities in Automation 360 Cloud.  
For more information about the entities you must create, see [Prerequisites for manual migration](#).
2. Upload the bots:

Version	Steps
<b>11.x</b>	<a href="#">Import bots</a>
<b>10.x</b>	<ol style="list-style-type: none"> <li><a href="#">Upload bot and its dependencies</a> The bots are uploaded to the private workspace in Automation 360. Ensure you have created the same folder structure in the public workspace as in 10.x Control Room. You must upload all dependent bots and other files required by the uploaded bots to run successfully in Automation 360. All uploaded bots, their dependent bots, and other required files must be stored in the same folder in the Automation 360 as in 10.x.</li> <li>Check in the uploaded bots that are available in the private workspace. <a href="#">Check in a bot</a></li> </ol>

[Prerequisite tasks for migrating bots](#)

## Prerequisites for manual migration

When you migrate from 11.x or 10.x if you have not used the 11.x database or copied 10.x data, you must manually create all the entities of 11.x or 10.x in Automation 360.

Create the following 11.x or 10.x entities except bots in Automation 360:

- [Create a user](#)
- [Create and assign roles](#)
- Credentials and lockers used in bots

[Credentials and lockers in the Credential Vault](#)

- **AAApplicationPath** global value and set its value the same as 11.x or 10.x for the required users
- **AADefaultDateFormat** global value and set its value as MM/DD/YYYY HH:MM:SS.

- The following global values that will be used by the **Send email** action:
  - AAE\_EmailSettings\_auth
  - AAE\_EmailSettings\_host
  - AAE\_EmailSettings\_port
  - AE\_EmailSettings\_ssl

The values for the preceding global values must be the same as specified in 11.x in **Tools > Options > Email Settings**.

- The following global values if you have used Exchange Web Services (EWS) in 11.x:
  - AAE\_EmailSettings\_tenantId
  - AAE\_EmailSettings\_clientId
  - AAE\_EmailSettings\_domainName
- Create the same folder structure as 11.x or 10.x in Automation 360
- Upload all 11.x or 10.x bots and their dependencies to the Automation 360 Control Room.  
You must upload the bots and their dependencies at the same location as in 11.x or 10.x.
- Migrate the bots in the following sequence:
  1. MetaBots
  2. Child bots
  3. Parent or main bots

---

**Important:** You must create all of the preceding entities in Automation 360 the same as how they are available in 11.x or 10.x.

---

## Prepare for 11.x to Automation 360 Cloud-enabled migration

Perform the tasks in this workflow to migrate from Automation Anywhere Enterprise 11.x to Automation 360 Cloud enabled, including migration of your bots.

If you are installing Automation 360 on a machine on which 11.x was previously installed, we recommend you delete the data from the Elasticsearch data folder located at `C:\ProgramData\elasticsearchdata`.

---

**Note:** If the location of the Elasticsearch data folder was changed, you can find the updated information in the `C:\Program Files\Automation Anywhere\Enterprise\elasticsearch\config\elasticsearch.yml` file.

---

Ensure you have procured and activated your migration license.

### *Get migration license*

1. Install the Automation 360 for Cloud enabled deployment.  
*Installing Control Room for Cloud-enabled deployment*
2. Create all the entities such as users, roles, and credentials except bots in Automation 360 the same as how they are available in 11.x.  
*Prerequisites for manual migration*
3. Export all 11.x bots and their dependencies that you want to migrate to Automation 360 using Bot Lifecycle Management.  
*Export bots*

4. Import all 11.x bots to Automation 360 using Bot Lifecycle Management.

*Import bots*

5. Optional: Migrate audit log data.

*Migrate 11.x audit logs*

*Prerequisite tasks for migrating bots*

## Prepare for 11.x to Automation 360 On-Premises migration

Perform the tasks in this workflow to migrate from Automation Anywhere Enterprise 11.x to Automation 360 On-Premises, including migration of your bots to Automation 360. Dashboards created in Bot Insight for 11.x analytics bots are also migrated.

- If you are installing Automation 360 on a machine on which 11.x was previously installed, you must delete the data from the Elasticsearch data folder located at `C:/ProgramData/elasticsearch/data`.

If the location of the Elasticsearch data folder was changed, you can find the updated information in the `C:\Program Files\Automation Anywhere\Enterprise\elasticsearch\config\elasticsearch.yml` file.

---

**Important:** If you delete the Elasticsearch data, you will lose the 11.x audit data.

---

- Ensure you have procured and activated your migration license.

*Get migration license*

---

**Recommendation:** Install Automation 360 on a separate server to ensure that your 11.x environment is not impacted by the migration activities.

---

1. We recommend that you create a backup of the 11.x database and restore it in the same or different SQL instance to avoid failure of any automation task that is using the 11.x database.

*Quickstart: Back up and restore a SQL Server database on-premises*

**Bot Insight migration:** The Bot Insight data and dashboards are migrated as part of the overall migration process. For the migration, clone your Bot Insight database (which is different from your 11.x Control Room database) and extract and export your dashboard metadata to Automation 360 using the Bot Insight pre-migration utility.

*Export 11.x Bot Insight dashboards for migration*

2. If you are migrating from Version 11.3.5 or later versions, delete data from the `ES_SETTINGS` table from the 11.x Control Room database.
3. Copy and paste the 11.x Control Room repository and update access URL and repository path.  
*Copy and paste 11.x information to Automation 360*
4. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.

**5.** Install Automation 360 On-Premises:

- a) Ensure you meet the system requirements.

*Automation 360 On-Premises prerequisites*

- b) Install Automation 360 On-Premises Control Room in custom mode to a staging environment.

*Installing Control Room using Custom mode*


---

**Important:** During the installation, configure the Automation 360 On-Premises Control Room to use the restored 11.x database.

---

**6.** Optional: Migrate audit log data.*Migrate 11.x audit logs*

To learn more, search for the *Migrating from enterprise 11 to Automation 360 On-Premises* course in *Automation Anywhere University: RPA Training and Certification (A-People login required)*.

*Prerequisite tasks for migrating bots*

## Back up and restore 11.x database

Before you start migration, back up and restore your 11.x database.

*Quickstart: Back up and restore a SQL Server database on-premises*

## Copy and paste 11.x information to Automation 360

The 11.x server repository files and the Credential Vault file are required in the Automation 360 environment. The most efficient way to get this data is to copy it from the 11.x environment into Automation 360.

You must copy the necessary files from Automation Anywhere Enterprise 11.x data and paste it **before** installing Automation 360. You must also run the queries to update the Control Room access URL and repository path.

To learn more about how to migrate to Automation 360, search for the following courses in *Automation Anywhere University: RPA Training and Certification (A-People login required)*:

- *Migrating from Enterprise 11 to Automation 360 On-Premises*
- *Migrating from Enterprise 10 to Automation 360 On-Premises*

**1.** Copy and paste the 11.x repository data.

The location of the 11.x repository is available from **Administration > Settings > General** in the 11.x Control Room.

*Configuration settings*

- If the 11.x Credential Vault is configured in **Manual** mode, you must change the Credential Vault mode to express mode. This is to ensure that the credentials and variables available within the 11.x

Credential Vault are migrated to the Automation 360. You can change the mode back to manual after the Control Room data is migrated. See [Configure Credential Vault Connection mode](#).

- If your 11.x Control Room has version control enabled; the latest versions of each bot, including the dependencies, are copied and migrated from the 11.x repository to Automation 360. However, the version history of the bot and its dependencies are not copied and migrated.

- Create a folder for Automation 360 at any location on the device.  
For example, D:\New project\Automation 360.
- Create the following folders within the Automation 360 folder you have created in the previous step: AutomationAnywhere\Server Files\Default\0\Automation Anywhere\Bots  
Based on the folders you created in the previous step, the final folder structure must be: D:\New project\Automation 360\AutomationAnywhere\Server Files\Default\0\Automation Anywhere\Bots

The D:\New project\Automation 360 in the folder structure is the dynamic path, which can be any location based on your requirement. Whereas the AutomationAnywhere\Server Files\Default\0\Automation Anywhere\Bots is a constant path that does not change.

- Copy and paste the 11.x CredentialVault.dat file and the folders that contain bots and MetaBots in the folder structure you have created in the previous step.

11.x files and folders to be copied	11.x location	Automation 360 location
CredentialVault.dat file	AutomationAnywhere\Server Files	AutomationAnywhere\Server Files
All the files and folder including My Tasks and My MetaBots folders	\AutomationAnywhere\Server Files\Default\Automation Anywhere\	\AutomationAnywhere\Server Files\Default\0\Automation Anywhere\Bots\

**Note:** If you want to set up a cluster configuration in Automation 360, you must paste the copied 11.x data on a shared network location that all the nodes can access in the cluster.

2. Update the Control Room access URL and repository path by running the following SQL commands on the restored 11.x database:

- a) To update the access URL: update CONFIGURATION set value = '[Automation 360 Control Room URL]' where category = 'CR\_setup\_general' and config\_key = 'AccessUrl'

**Example query:** update [Automation 360-Database].[dbo].[CONFIGURATION] set value = 'http://Automation 360-crurl.com' where config\_key='AccessUrl'

---

**Note:** Do not include a slash (/) at the end of the access URL that you provide in the above command.

---

- b) To update the repository path: update CONFIGURATION set value = Automation 360 Control Room dynamic path followed by \AutomationAnywhere\Server Files where category = 'CR\_setup\_general' and config\_key = 'RepositoryPath'

The dynamic path in the query is the dynamic path where you have pasted the copied 11.x data in the above step.

**Example query:** update [Automation 360-Database].[dbo].[CONFIGURATION] set value = 'D:\New project\Automation 360\AutomationAnywhere\Server Files' where config\_key='RepositoryPath'

The path mentioned in the query is the same as the dynamic path where the 11.x data is copied in the example in the previous step.

After installing Automation 360, perform these steps:

1. Log in to Automation 360.
2. Navigate to **Bots > My Tasks**.
3. Verify that all the data you pasted is available in the relevant files and folders.

## Export 11.x Bot Insight dashboards for migration

Use the Bot Insight pre-migration utility to export your 11.x Bot Insight dashboard metadata (widgets and layouts) and dashboard profile as a zip file. Run this utility in your 11.x device and paste the zip file in the Automation 360 repository to migrate the Bot Insight dashboards.

- Back up the Bot Insight database after you have backed up the 11.x Control Room database and restore it in the SQL Server instance.

Ensure that you use the same username and password of the Control Room database used in Automation 360 when you restore the Bot Insight database.

- Ensure that JRE is installed in the 11.x device.

1. Download the latest version of the Bot Insight pre-migration utility from the Automation Anywhere Support site.

---

**Important:** You must download the utility on the device on which the 11.x Control Room is installed.

---

- a) Navigate to the Automation Anywhere Downloads page: [A-People Downloads page \(Login required\)](#).
- b) Click the **Automation Anywhere Enterprise A2019** link.
- c) Download the `AAE_Export_BI_Dashboards_<version_number>` file, for example, `AAE_Export_BI_Dashboards_A2019.17.jar`.

2. Run the utility in the 11.x device.
  - a) Open the Windows command prompt.
  - b) Run the following command to export the Bot Insight dashboards to a zip file:
 

```
java -jar "<path_of_downloaded_utility_jar>/AAE_Export_BI_Dashboards_<version_number>.jar" -installationPath "<installation_path>/Enterprise" -outputDir "<path_to_save_zip_file>/dashboards"
```

**For example:**

```
java -jar "Downloads/AAE_Export_BI_Dashboards_A2019.17.jar" -installationPath "C:/Program Files/Automation Anywhere/Enterprise" -outputDir "E:/AA/work/release/A2019/migration/dashboard"
```

 The utility generates the `dashboards.zip` file at the output directory you specified.

---

**Note:** You can also use double backslash (\\) to run the JAR file.

---

3. Create the `bot-insight` folder at the Automation 360 installation location.  
 For example, `C:\Program Data\Automation Anywhere\Server Files\bot-insight`  
 In this path, `C:\Program Data\Automation Anywhere\Server Files` is a dynamic path, which can be any location based on your requirement. The folder structure following the dynamic path (`\bot-insight`) is a constant path that does not change.
4. Copy the `dashboards.zip` file available at the output location and paste in the `Server Files \bot-insight` folder.

After exporting dashboards in the Automation 360 repository, do the following for migrating the Bot Insight dashboards.

1. Install Automation 360 and log in to your Automation 360 staging environment.  
[Installing Control Room On-Premises](#)
2. Migrate the bots along with the Bot Insight data and dashboards using the Bot Migration Wizard.  
[Migrate Enterprise bots](#)

## Migrate 11.x audit logs

The audit log export utility enables you to export the audit log data from the 11.x Control Room to a JSON file. You must paste the JSON file in the Automation 360 repository and then migrate the audit log data.

Ensure you have the **AAE\_Admin** role or the **Manage Migration** permission.

---

**Important:** Migration of audit log data of Version 11.3.5 or later versions to Automation 360 is not yet supported.

---

Based on the current version of your Control Room, choose one of the following ways to export and migrate the audit log data:

- **For Version 11.3 and later:**

- a) Download the latest version of the audit log export utility from the Automation Anywhere Support site.

---

**Important:** You must download the utility on the machine on which the Version 11.3 Control Room is installed. If the Control Room is installed in **Cluster mode**, you can download the utility on any of the node available in the cluster.

---

- a. Navigate to the Automation Anywhere Downloads page: [A-People Downloads page \(Login required\)](#).
  - b. Click the Automation 360 link.
  - c. Click **Installation Setup**, and then click the `AAE_Export_Audit_Log_<version_number>` zip file, for example, `AAE_Export_Audit_Log_A2019.16.zip`.
- b) Extract the files from the zip file you have downloaded.
  - c) Open the Windows command prompt.
  - d) Change the working directory to `AAE_Export_Audit_Log_<version_number>`, for example, `AAE_Export_Audit_Log_A2019.16`, and enter the following command: `..\bin java -jar AAE_Export_Audit_Log_<version_number>.jar export.path="OUTPUT LOCATION" es.url="ELASTIC SEARCH URL"`

Update the following values in the command:

- **ELASTIC SEARCH URL:** Replace the text with the Elasticsearch URL that contains the audit logs you want to migrate. For example, `http://example.com:47599`.

Information about the port used by Elasticsearch is available in the `elasticsearch.properties` file, which is located at `C:\Program Files\Automation Anywhere\Enterprise\config\`. The value available in the `elasticsearch.port` attribute indicates the port used for Elasticsearch.

- **OUTPUT LOCATION:** Replace the text with the location where you want to save the output.
  - Ensure that the folders mentioned in the location exist.
  - Ensure that you specify the location of the output folder in double quotation marks. For example, `java -jar AAE_Export_Audit_Log_A2019.16.jar export.path="C:\Migration\Audit Log"`

The utility generates the `es_export.json` file at the output location you specified. The generated JSON file contains a maximum of 10000 records. If there are more than 10000 records

available in the audit data, the utility generates multiple JSON files at the same location and adds a suffix such as `es_export_1`.

- e) Create the `migration\es-data` folders in the Automation 360 repository.
- f) Copy the JSON file available at the output location.  
If the utility has generated multiple JSON files, you must copy all the files.
- g) Paste the JSON file in the `Server Files\migration\es-data` folder.
- h) Log in to your Automation 360 staging environment.
- i) Go to **Administration > Migration**.
- j) Click **Migrate Audit log** from the **Migrate bots** menu on the top-right of the screen.  
The system starts retrieving and migrating the audit log data from the `es_export.json` file and uploading it to Automation 360 Elasticsearch. The entries are displayed in the **Audit Log** tab of Automation 360.

After the Audit log migration is complete, navigate to **Administration > Migration** page to view the status of the audit log migration and other related information. You can also filter the audit log migration results based on the migration **Type** as the **Audit log migration**.

Click the **View migration** option for each audit migration instance to see additional information such as the audit log file path and the reasons why individual `es_export.json` files were skipped or were not successfully migrated when migrating the audit logs.

[View migration reports](#)

- **For version 11.2 and earlier:**

- a) Log in to your Automation 360 staging environment.
- b) Go to **Administration > Migration**.
- c) Click **Migrate Audit data** from the **Migrate bots** menu on the top-right of the screen.  
The system starts retrieving and migrating the audit data from the database and uploading it to the Automation 360 Elasticsearch. The entries are displayed in the **Audit Log** tab of Automation 360.

### Related tasks

[View migration reports](#)

Use the reports to analyze the status of individual bot migration, data migration, and audit log migration and identify the status and summary of the individual migration.

## Prepare for migration when using 11.x and Automation 360 On-Premises in parallel

Perform the tasks in this workflow if you want to use both Automation 360 On-Premises and 11.x in parallel. You can continue to use both environments till the time you are ready to start the migration from 11.x to Automation 360 On-Premises.

- If you are installing Automation 360 on a machine on which 11.x was previously installed, you must delete the data from the Elasticsearch data folder located at `C:/ProgramData/elasticsearch/data`.

If the location of the Elasticsearch data folder was changed, you can find the updated information in the `C:\Program Files\Automation Anywhere\Enterprise\elasticsearch\config\elasticsearch.yml` file.

---

**Important:** If you delete the Elasticsearch data, you will lose the 11.x audit data.

---

- Ensure you have procured and activated your migration license.

*Get migration license*

---

**Recommendation:** Install Automation 360 on a separate server to ensure that your 11.x environment is not impacted by the migration activities.

---

1. We recommend that you create a backup of the 11.x database and restore it in the same or different SQL instance to avoid failure of any automation task that is using the 11.x database.

*Quickstart: Back up and restore a SQL Server database on-premises*

**Bot Insight migration:** The Bot Insight data and dashboards are migrated as part of the overall migration process. For the migration, clone your Bot Insight database (which is different from your 11.x Control Room database) and extract and export your dashboard metadata to Automation 360 using the Bot Insight pre-migration utility.

*Export 11.x Bot Insight dashboards for migration*

2. If you are migrating from Version 11.3.5 or later versions, delete data from the `ES_SETTINGS` table from the 11.x Control Room database.
3. Copy and paste the 11.x Control Room repository and update access URL and repository path.  
*Copy and paste 11.x information to Automation 360*
4. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.
5. Install Automation 360 On-Premises:
  - a) Ensure you meet the system requirements.  
*Automation 360 On-Premises prerequisites*
  - b) Install Automation 360 On-Premises Control Room in custom mode to a staging environment.  
*Installing Control Room using Custom mode*

---

**Important:** During the installation, configure the Automation 360 On-Premises Control Room to use the restored 11.x database.

---

6. Continue using both 11.x and Automation 360 environments in parallel.

---

**Recommendation:** Create all new bots and entities such as users, roles, and schedules in Automation 360.

---

7. If you create any new entity such as users, roles, or schedules (except bots) in 11.x after installing Automation 360, create the same entity in Automation 360.
8. When you are ready to use only Automation 360 as your production environment:
  - a) If you have created new bots in 11.x after installing Automation 360:
    1. Export all the bots and their dependencies that were created after Automation 360 was installed using Bot Lifecycle Management.

*Export bots*

2. Import all the bots to Automation 360 using Bot Lifecycle Management.

*Import bots*

9. Optional: Migrate audit log data.

*Migrate 11.x audit logs*

*Prerequisite tasks for migrating bots*

## How WLM data is migrated

Automation Anywhere Enterprise 11.x workload management (WLM) data is automatically migrated to Automation 360 when you install Automation 360 and point the Control Room to the restored 11.x database.

When you migrate WLM data to Automation 360, all related WLM is moved to the Automation 360 environment, including queues, device pools, owners, and consumers. Migrated device pools are empty because the migration process does not migrate devices. You must update the device pool with the relevant unattended Bot Runner devices.

Bots associated with a workload template are migrated to the same Automation 360 template with all information intact.

The following work item variables are supported for migration:

- `$WorkItem$` – How this variable is migrated depends on the String, Number, and DateTime type associated with it.

### *Variable mapping for migration*

- `$WorkItemResult$` – Bots using this variable must be associated with a workload template in 11.x if you want to use it after migration. If you migrate a bot that has the `$WorkItemResult$` variable in a command and the bot is not linked to a workload template, then the command shows an error when it is opened in the Bot editor in Automation 360.

The following work item variable operations are not yet supported and bots using these variable operations cannot be migrated successfully:

- Reset `$WorkItem$`
- Reset `$WorkItemResult$`

### **Related tasks**

#### [Edit device pools](#)

As a Control Room user with device pool management privileges or as a device pool owner, you can edit device pool details to customize your automation requirements.

#### [Use Work Item variables](#)

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

## Prepare for 11.x to Automation 360 on Linux CentOS migration

Perform the tasks in this workflow to migrate from Automation Anywhere Enterprise 11.x to Automation 360 On-Premises on Linux CentOS, including migrating your bots to Automation 360. If the 11.x bot is enabled for analytics, the associated Bot Insight data and business analytics dashboard are also migrated.

---

**Recommendation:** Create a new environment for migrating to Automation 360 to avoid any issues to your existing bots due to migration activities.

---

1. We recommend that you create a backup of the 11.x database and restore it in the same or different SQL instance to avoid failure of any automation task that is using the 11.x database.

*Quickstart: Back up and restore a SQL Server database on-premises*

2. If you are migrating from Version 11.3.5 or later versions, you must delete data from the `ES_SETTINGS` table from the 11.x Control Room database.
3. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.

4. Copy and paste the 11.x Control Room repository:
  - a) Use the `sudo mkdir -p /opt/automationanywhere/enterprise/appdata/` command to create the required Automation 360 folders.
  - b) Use the `sudo chmod -R 775 /opt/automationanywhere` command to provide the required permissions for the folders.
  - c) Use the `sudo mv` command to copy the 11.x repository and paste it in the `automationanywhere/enterprise/appdata/` location.
  
5. Update the Control Room access URL and repository path by running the following SQL commands on the restored 11.x database:
  - a) To update the access URL: update CONFIGURATION set value = '[Automation360 Control Room URL]' where category = 'CR\_setup\_general' and config\_key = 'AccessUrl'  
**Example query:** update [Automation360-Database].[dbo].[CONFIGURATION] set value = 'http://Automation360-crurl.com' where config\_key='AccessUrl'

---

**Note:** Do not include a slash (/) at the end of the access URL that you provide in the above command.

---

  - b) To update the repository path: update CONFIGURATION set value = /opt/automationanywhere/enterprise/appdata/Server Files where config\_key = 'RepositoryPath'
  
6. Install Automation 360 On-Premises:
  - a) Ensure you meet the system requirements.  
[Automation 360 On-Premises prerequisites](#)
  - b) Install Automation 360 On-Premises Control Room in custom mode to a staging environment.  
[Installing Control Room on Linux](#)

---

**Important:** During the installation, configure the Automation 360 On-Premises Control Room to use the restored 11.x database.

---

## 7. Optional: Migrate audit log data.

[Migrate 11.x audit logs](#)

[Prerequisite tasks for migrating bots](#)

## Prepare for 10.x to Automation 360 On-Premises migration

Perform the tasks in this workflow to migrate from Automation Anywhere Enterprise 10.x to Automation 360 On-Premises, including migration of your bots to Automation 360.

Ensure you have procured and activated your migration license.

[Get migration license](#)

---

**Recommendation:** Install Automation 360 on a separate server to ensure that your 10.x environment is not impacted by the migration activities.

---

1. We recommend that you create a backup of the 11.x database and restore it in the same or different SQL instance to avoid failure of any automation task that is using the 11.x database.

[Quickstart: Back up and restore a SQL Server database on-premises](#)

2. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.
3. Install Automation 360 On-Premises:
  - a) Ensure you meet the system requirements.  
*Automation 360 On-Premises prerequisites*
  - b) Install Automation 360 On-Premises Control Room in custom mode to a staging environment.  
*Installing Control Room using Custom mode*

---

**Important:** You must install Automation 360 with a new database.

---

- c) Configure the same authentication in Automation 360 as in 10.x.  
Do not switch authentication types between 10.x and Automation 360. For example, if Active Directory is set as authentication in 10.x, you must configure Active Directory as authentication in Automation 360 as well.
4. Complete the pre-migration tasks.  
*Pre-migration tasks*
5. Create the **AAApplicationPath** global value in Automation 360 and set the same value as 10.x.  
*Variable mapping for migration*
6. Copy the 10.x data to Automation 360.  
*Copy 10.x data*

### *Migrate Enterprise bots*

## How 10.x data is copied to Automation 360

10.x users, roles, licenses, credentials, bots, and schedules are copied to Automation 360 as part of the copy data process.

The system copies 10.x data in the following order:

1. Roles
2. Users
3. Credentials
4. Bots
5. Schedules

If the copy process skips an item in the sequence for any reason, then all related items are also skipped and are not migrated. For example, if the Bot\_Manager role is not migrated and the user Jane\_Smith only belongs to that role, then that user account and any credentials, bots, or schedules associated with that role are also not migrated.

10.x items	How 10.x items are copied to Automation 360
Users	<p>When you copy 10.x users the first time, if the system encounters a user of the same name in Automation 360, the migration process renames the 10.x username by adding a suffix such as _1, _2, and so on, and then copies the renamed user to Automation 360. For example, a duplicate username Jane_Smith is renamed as Jane_Smith_1 in Automation 360. Subsequent data copy operations will skip the previously migrated user data.</p> <p>For Active Directory users, the system does not migrate duplicate users. If a domain user with the same name already exists in Automation 360, the migration process skips that user and its dependencies.</p>
Roles	<p>The first time you copy 10.x roles, the migration process handles duplicate system roles and custom roles differently. The migration process maps 10.x system roles to Automation 360 system roles. For example, the 10.x Admin role and Basic role are mapped to the AAE_Admin role and AAE_Basic role, respectively.</p> <p>If a custom role of the same name exists in 10.x and Automation 360, the migration process renames it by adding a suffix such as _1, _2, and so on, and then copies the renamed role to Automation 360. For example, a duplicate Sales_Operations role is renamed as Sales_Operations_1 in Automation 360.</p> <p>Subsequent data copy operations will skip previously migrated roles.</p>
Licenses	<p>The migration process automatically migrates user allocated licenses, but they are not shown in the migration report. If the Automation 360 Control Room has fewer Bot Creator or Bot Runner licenses than 10.x Control Room and all Automation 360 licenses have been consumed, then newly migrated users will not be allocated any licenses. The system migrates these users and the related data without allocating any new licenses.</p>
Credentials	<p>For system credentials associated with a migrated user, the system migrates only the Email Settings and Autologin Settings system credentials.</p> <p>For credentials created by the Control Room administrator, the system creates the <b>AAE_10x_Credentials</b> locker in the Automation 360 Credential Vault and adds the credentials from 10.x as standard credentials. The system assigns the user who migrates the 10.x data as the owner of the <b>AAE_10x_Credentials</b> locker and all custom roles as consumers of the locker. If a locker with the name <b>AAE_10x_Credentials</b> already exists in Automation 360, the system adds the migrated credentials in that locker.</p> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Migration of credentials with more than 50 attributes is not supported.</li> <li>• Users with only <b>AAE_Basic</b> role assigned to them in 10.x must be granted a custom role in Automation 360 to be a consumer of the <b>AAE_10x_Credential</b> locker.</li> </ul> <hr/>

10.x items	How 10.x items are copied to Automation 360
Bots	<p>If a bot of the same name exists in 10.x and Automation 360, the copy data process skips the bot migration and its associated schedule. Commands that use credential variables in 10.x bots use the <b>AAE_10x_Credentials</b> locker after migration.</p> <p>If your 10.x Control Room is configured with SVN version control, then the copy data process also copies the latest version of each bot including the dependencies from the 10.x repository to the Automation 360 repository. Use the bot migration wizard to migrate the 10.x bots to Automation 360. However, the version history of the bot and its dependencies are not copied and migrated.</p> <hr/> <p><b>Note:</b> Migration of the production version of 10.x bots is currently not supported. As a workaround, make or set the current production version of the bots as the latest version and then migrate the bots.</p> <hr/>
Schedules	<p>If duplicate schedules exist in both environments, the duplicate schedule is migrated and results in two schedules of the same name in Automation 360.</p> <p>Migration of schedules fails if the associated user does not exist in Automation 360.</p>

### Related tasks

#### [Copy 10.x data](#)

You must copy the 10.x data to Automation 360 before you convert the 10.x bots.

#### [Enable schedules after migration](#)

When you copy 10.x data to Automation 360, the 10.x schedules are migrated. Version 11.x schedules are migrated when you update the 11.x data to Automation 360.

## Copy 10.x data

You must copy the 10.x data to Automation 360 before you convert the 10.x bots.

The user performing this task must have the **AAE\_Admin** role.

1. Log in to your Automation 360 staging environment.
2. Click **Administration > Migration**.
3. Click **Copy 10.x data**.
4. Provide the following information on the **GENERAL** page.

Option	Action
<b>Name</b>	Enter a migration name or use the default one. The default migration name shows the name of the user who is logged in, current date, and time stamp.
<b>Description</b>	Enter a description for the migration.

5. Click **Next**.

6. Provide the following information on the **DATABASE** page.

Option	Action
<b>Use secure connection</b>	Select this option to use a secure connection to connect with the database.
<b>Server host name</b>	Enter the host name of the database server that contains the 10.x data you want to migrate.
<b>Server port</b>	Enter the port you want to use to connect with the database server.
<b>Use database credentials</b>	Select this option to use database credentials for authentication when establishing a connection with the database server.  If you have selected this option, provide the credentials you want to use to connect to the database server in the <b>Username</b> and <b>Password</b> fields.
<b>Use Windows authentication</b>	Select this option to use Windows authentication for establishing a connection with the database server.  <b>Important:</b> This option works only if you have configured a domain account during installation and which has read and write permissions for 10.x database.
<b>Database name</b>	Enter the database name that contains the 10.x data you want to migrate.
<b>Connect</b>	Click this option to establish a connection with the database.

7. Click **Next**.8. Provide the following information on the **REPOSITORY** page.

Option	Action
<b>Repository path</b>	Enter the location of the restored 10.x data that is available on the device.
<b>Master key</b>	Enter the master key for 10.x.
<b>Validate</b>	Click this option to validate the connection before you copy the 10.x data.

9. Click **Copy data**.*Migrate Enterprise bots*

After you have successfully copied the 10.x data to Automation 360, convert the 10.x bots.

**Related concepts**

[How 10.x data is copied to Automation 360](#)

10.x users, roles, licenses, credentials, bots, and schedules are copied to Automation 360 as part of the copy data process.

**Related tasks**

[Enable schedules after migration](#)

When you copy 10.x data to Automation 360, the 10.x schedules are migrated. Version 11.x schedules are migrated when you update the 11.x data to Automation 360.

## Prepare for migration when using 10.x and Automation 360 On-Premises in parallel

Perform the tasks in this workflow if you want to use both Automation 360 On-Premises and 10.x in parallel. You can continue to use both environments till the time you are ready to start the migration from 10.x to Automation 360 On-Premises.

Ensure you have procured and activated your migration license.

[Get migration license](#)

---

**Recommendation:** Create a new environment for migration to Automation 360 to avoid any issues to your existing bots because of migration activities.

---

1. We recommend that you create a backup of the 11.x database and restore it in the same or different SQL instance to avoid failure of any automation task that is using the 11.x database.

[Quickstart: Back up and restore a SQL Server database on-premises](#)

2. Ensure that all the credential variables used in the 11.x bots are available in the 11.x Control Room.
3. Install Automation 360 On-Premises:
  - a) Ensure you meet the system requirements.
  - b) Install Automation 360 On-Premises Control Room in custom mode to a staging environment.

[Installing Control Room using Custom mode](#)

---

**Important:** You must install Automation 360 with a new database.

---

4. Complete the pre-migration tasks.

[Pre-migration tasks](#)

5. Create the **AAApplicationPath** global value in Automation 360 and set the same value as 10.x.

[Variable mapping for migration](#)

6. Copy the 10.x data to Automation 360.

[Copy 10.x data](#)

7. Continue using both 10.x and Automation 360 environments in parallel.

---

**Recommendation:** Create all new bots and entities such as users, roles, and schedules in Automation 360.

---

8. If you create any new entity such as users, roles, schedules, and bots in 10.x after installing Automation 360, create the same entity in Automation 360.

9. When you are ready to use only Automation 360 as your production environment:
  - a) If you have created new bots in 10.x after installing Automation 360:
    1. Copy all the bots and their dependencies from 10.x by using the **Copy 10.x data** option in the Automation 360.
    2. Login as the Bot Creator to upload the bots and their dependencies to the Automation 360 private workspace. Note that the folder structure of the bots and their dependencies must be same as that of version 10.x.
    3. Check in the bots to the public workspace.

### *Migrate Enterprise bots*

## Prerequisite tasks for migrating bots

After you have installed Automation 360 On-Premises or uploaded data to Automation 360 Cloud, you must perform certain tasks before migrating the 10.x or 11.x bots.

- 11.x to Automation 360 Cloud migration: Upload 11.x data to Automation Anywhere Cloud using the Cloud Migration Utility.

#### *Upload 11.x data using Cloud Migration Utility*

- 11.x or 10.x to Automation 360 On-Premises migration: Install Automation 360.

#### *Installing Control Room using Custom mode*

- 11.x to Automation 360 On-Premises on Linux CentOS migration: Install Automation 360 on a Linux CentOS instance.

#### *Installing Control Room on Linux*

- For migration to be successful, the license requirements of the target environments must match the existing source or environments.
- At least one license is required for migration.

1. Assign the **AAE\_Bot Migration Admin** role to the user who initiates the migration and the Bot Runner user that will be used to perform the migration.

The Bot Runner user runs the migration and must have the following permissions and criteria:

- An unattended Bot Runner license
- **Autologin Set** status
- Default device configured

2. 11.x users who has installed Automation 360 using a fresh database and 10.x users who has not copied 10.x data must manually create the all 11.x or 10.x entities except bots in Automation 360:

For more information about the entities you must create, see [Prerequisites for manual migration](#).

3. Install the Bot agent on the device that you want to use for migration.

#### *Install Bot agent and register device*

4. Optional: To migrate the production version of bots, import the 11.x bots using the BLM feature from the SVN version control enabled 11.x Control Room.

#### *Import bots*

- **10.x:** [Copy 10.x data](#)
- **11.x:** [Migrate Enterprise bots](#)

## Migrate and validate bots

Perform the tasks in this workflow to convert your bots to the Automation 360 format and to validate them after migration.

Ensure that you have completed all the tasks about preparing your Automation 360 environment for migration: [Plan and prepare for migration](#).

1. Migrate your 11.x and 10.x bots to Automation 360: [Migrate Enterprise bots](#).
2. Verify the migration is completed successfully:
  - [View migration reports](#)
  - [Verify the bot migration](#)
  - [Export to CSV](#)
  - [View changes to migrated bots using Migration Assistant](#)

## Migrate Enterprise bots

The bot migration process uses the Bot Migration Wizard to convert 11.x or 10.x bots (TaskBots and MetaBots) in `.atmx` and `.mbot` format to the `.bot` format used in Automation 360 and uploads the successfully migrated bots to the Control Room public workspace.

Ensure you have completed all the prerequisite tasks for migrating bots: [Prerequisite tasks for migrating bots](#).

All manual dependencies of bots are automatically converted as Control Room dependencies during migration. The **Download Control Room file** action downloads these dependencies from the Control Room to the respective locations.

1. Log in to your Automation 360 staging environment.
2. Click **Administration > Migration**.

---

**Note:** If you have migrated bots from 10.x to 11.x, the information about that migration is not displayed on the **Migration List** page.

---

3. On the Bot Migration Wizard screen, click **Migrate bots**.
4. Provide information on the **Settings** page.

Option	Action
<b>Name</b>	Enter a migration name or use the default one. The default migration name shows the name of the user who is logged in, current date, and time stamp.
<b>Description</b>	Enter a description for the migration.
<b>Overwrite if a bot with the same name exists</b>	Select this option to overwrite an existing bot if a bot with the same name exists in the folder.
<b>Use "Excel Cell Row" legacy behavior</b>	Select this option if you are migrating from a version earlier than Version 11.3.0 or you want to retain the legacy behavior of the <b>Excel Cell Row</b> system variable.

Option	Action
<b>EWS email server settings</b>	<p>Select this option if you have used EWS in 11.x. If you have selected this option, complete the following fields:</p> <ul style="list-style-type: none"> <li>• <b>Domain name:</b> This field is prepopulated with the default global value.</li> <li>• <b>Exchange version:</b> Select an option from the list to specify the version of the EWS server configured in 11.x.</li> <li>• <b>Authentication type:</b> Select an option from the list to specify the authentication type set for the EWS server configured in 11.x.</li> </ul>

5. Click **Next**.

6. Select the bots and the folders that contain the bots (TaskBots and MetaBots) that you want to migrate.

The ability to select a folder eliminates the effort required in selecting individual bots from that folder.

- If you selected a folder, all subfolders within that folder and the bots within these subfolders are automatically selected for migration.
- If the folder is empty, the migration process encounters an error.

The **Last Migrated** column indicates when the bot was migrated previously. N/A means the bot has not been migrated before.

7. Click **Next**.

8. Select one or more usernames from the list to run the migration and click the right arrow.

Username can display either the message *Picked at run time* or the device name in the **Device** column. A device name indicates the registered device for that user. *Picked at run time* is shown when a user does not have a default device, for example, a user who has not registered a device and a system administrator has assigned a device to that user.

- Bots are distributed across selected Bot Runner users in a round-robin method.
- The first Bot Runner user on the selected list is the first one used.
- A parent bot and its dependencies are assigned to a single Bot Runner user.

9. Click **Next**.

10. Optional: Review the dependent TaskBots and MetaBots on the **Bot and Dependent Bots** page before you migrate them.

If you have selected a folder and bots from the **Bots** page, that folder and dependencies of the selected bots are displayed in the table.

Dependent bots (TaskBots and MetaBots) are migrated before the primary bot.

The table shows the primary bot at the bottom and its dependencies above. For example, the following information means that *Sample05.atmx* has a dependency on *Sample04.atmx*, and *Sample04.atmx* has a dependency on *MessageBox.atmx* and *MetaTask.mbot*.

Type	Name	Path
MetaBot (mbot)	MetaTask.mbot	Bots\My Metabots \MetaTask.mbot
TaskBot (atmx)	MessageBox.atmx	Bots\MyTasks \MessageBox.atmx

Type	Name	Path
TaskBot (atmx)	Sample04.atmx	Bots\MyTasks \Sample04.atmx
TaskBot (atmx)	Sample05.atmx	Bots\MyTasks \Sample05.atmx

11. Click **Next**.

12. Optional: Select an option from the **Validate permissions** page to validate the permissions required by the user to perform the migration.

Option	Description
<b>Myself</b>	Validates the permissions assigned to the logged-in user who is initiating the migration.
<b>The Run-as user</b>	Validates the permissions assigned to the user (Run-as) you selected to run the migration in Step 9. The system uses this user to convert bots and perform the migration.
<b>Both</b>	Validates the permissions required by both users: the logged-in user who is initiating the migration and the Run-as user who will perform the migration.

13. Click **Validate**.

The system verifies if the required permissions are assigned to user you have selected.

*Permissions required for logged-in user and Run-as user*

The validation result provides information about any of the required permissions is not granted to the selected user. If any of the required permissions is not granted, you must grant those permissions and start the migration process again.

---

**Note:** The **Migrate Bots** option is not enabled until all the required permission are granted to the selected user.

---

14. Click the **Migrate Bots** option from the **Migrate Bots** menu.

The system starts migrating the selected bots and their dependent bots. A progress bar in the **MIGRATION RESULTS** tab shows the progress of the migration.

After the migration, the system uploads successfully migrated bots, the associated Bot Insight data, and the published dashboards to the public workspace of the Automation 360 Control Room (in the same folder in which the .atmx file is available). Only bot migrations initiated from the Control Room are stored in the public workspace.

a) Check out the bot to migrate the private dashboards associated with that bot.

The private dashboards are migrated only for the user who checked out the associated bot for the first time.

b) View in-progress migration activities from the **Activity** > **In progress** page.

[Verify the bot migration](#) | [View migration reports](#)

#### Related tasks

[View migration reports](#)

Use the reports to analyze the status of individual bot migration, data migration, and audit log migration and identify the status and summary of the individual migration.

#### [Export 11.x Bot Insight dashboards for migration](#)

Use the Bot Insight pre-migration utility to export your 11.x Bot Insight dashboard metadata (widgets and layouts) and dashboard profile as a zip file. Run this utility in your 11.x device and paste the zip file in the Automation 360 repository to migrate the Bot Insight dashboards.

## How MetaBots are migrated

When you migrate a MetaBot to Automation 360, equivalent bots are created for the various logic available in the MetaBot, except for application screens. After successful migration, each logic in a .mbot file is converted to a TaskBot file.

A MetaBot contains assets and logic. Assets are the application screens or DLLs that are used to automate a task on an application. Logic is a set of commands to perform an operation and interact with other logic and bots.

The migration process performs the following actions:

- Converts MetaBot logic to corresponding TaskBots.
- Maintains the folder structure of the MetaBots after it is migrated. The new folders created in Automation 360 contain the TaskBots for each logic migrated to Automation 360.
- Updates the TaskBots that use MetaBot logic to refer to the new TaskBots that are created for the migrated MetaBot logic.

You do not have to update the TaskBots manually.

Features such as use of DLLs, input and output variables, and **Execute** permission which were available only for MetaBots are now available for all TaskBots.

We will use the following MetaBot to explain how it is migrated to Automation 360:

- MetaBot name: MetaTask
- Assets:
  - Login screen
  - General.dll
  - DLL\Binary.dll
- Logic:
  - Common
  - Logic\Connect
  - Logic\Disconnect
  - Logic\Operations\Numeric

## MetaBot migration process

The system creates a folder with the same name as the MetaBot within the `My MetaBots` folder available in the `Bots` folder, and the same folder structure as 11.x is retained. For example, if the folder structure in 11.x is `Accounts/Tax/MetaTask.mbot`, the system retains the folder structure as `Accounts/Tax/MetaTask.mbot`. All the components of a MetaBot are stored in the folder created for that MetaBot. In this example, the system creates the `MetaTask` folder in the `Bots\My MetaBots` folder and stores all the components the MetaBot in that folder.

10.x bots that directly call DLLs and screens in a MetaBot without using MetaBot logic are migrated to the equivalent TaskBots and actions in Automation 360. In 10.x, if a DLL that returns a list or array type parameters and the output of that DLL is mapped with a value type parameter, an extra space is added at the start of the output value. The extra space is not added to the output value after migration of the bot.

10.1 MetaBots that use DLL functions that accept one-dimensional array and list type input parameters and is mapped with array type parameter. In such cases, row index and column index are required as inputs to specify the value to be returned. After migration, the row index is considered as column number.

---

**Note:** Bots that are upgraded from 10.1 to 10.3.5 and then migrated to Automation 360, the Bot Migration Wizard does not show the dependency on the **Bot and Dependent Bots** page. For such bots, you must migrate the MetaBots before migrating the TaskBots that are calling those MetaBots.

---

## Migration of DLLs

The system does not maintain the folder structure for assets in order to maintain the references between the DLLs. For the above example, `General.dll` and `Binary.dll` are stored in the `MetaTask` folder although the `Binary.dll` is stored in the `DLL` subfolder.

If you have used the same DLL in multiple MetaBot logic, the migrated TaskBots might not work as expected in Automation 360. Complete the following steps to make the migrated TaskBots work as expected:

1. Use the **Open** action of the **DLL** package in the migrated parent bot to use the DLL that is used by multiple MetaBot logic in 11.x.
2. Create a session type variable with the **DLL session** option selected from the **Session type** list in the migrated parent bot and all child bots of that parent bot.  
Ensure the **Use as input** option is selected when creating the session variable in the child bots.
3. Use the **Set shared session** action of the **DLL** package in the migrated parent bot and store the session information in the session variable created in the previous step.
4. From the Input values section of the **Run** action of the **Task Bot** package in the parent bot, select the options with the name of the session variables you have created in the child bots and then specify the session variable you have created for the parent bot in these fields.
5. Delete the **Open** and **Close** actions of the **DLL** package from all the equivalent TaskBots of the migrated MetaBot.
6. Select the **Shared session** tab in the **Run function** action in all the equivalent TaskBots of the migrated MetaBot and specify the session variable you have created for that bot.

## Migration of screens

Each screen in a MetaBot is converted to a windows variable and the actions performed on the screen are migrated to the equivalent actions in Automation 360.

The following table lists the screens that can be migrated to Automation 360:

Browser	Internet Explorer Google Chrome (for object play type only)
Screen type	Standard
Technology	Java, HTML, MSAA, .Net, UI Automation (for object play type only)

Play type	Object, Image, Coordinate
-----------	---------------------------

The following table provides information about the actions that are performed on an object play type object available on the screen is migrated to the equivalent actions in Automation 360:

Play type	11.x Action	Automation 360 Action
Object	Get Property, Get Total Items, Get Selected Index, Get Selected Text, Select Item by Text, Select Item by Index, Click, Left Click, Right Click, Double Click	<p>Migrated to the <b>Capture</b> action of the Recorder package.</p> <p>The <b>GetAllChildrenName</b> and <b>GetAllChildrenValue</b> commands in 11.x/10.x return string type variable values. In Automation 360, they return list values. The migration process joins the list values and stores them into a string variable to maintain consistent bot behaviors across releases.</p> <p>The <b>Object Cloning</b> command with the <b>Export to CSV</b> action in 11.x/10.x is migrated to:</p> <ul style="list-style-type: none"> <li>The <b>Capture</b> action of the Recorder package. This action saves the captured data into a table variable.</li> <li>The <b>Write to file</b> action of the Data Table package. This action saves the data from the table variable to the CSV file.</li> </ul>

The linked objects on a MetaBot screen that are captured using the object play type are migrated to the **Capture** action of the Recorder package. The source object is displayed in the **Main** tab and the linked object is displayed in the **Anchor** tab of the **Capture** action.

The following table provides information about the actions that are performed on an image play type object available on the screen is migrated to the equivalent actions in Automation 360:

Play type	11.x Action	Automation 360 Action
Image	Left Click	Migrated to the <b>Find window in window</b> action of the Image Recognition package with the <b>Left Click</b> selected from the <b>Action</b> list.
	Right Click	Migrated to the <b>Find window in window</b> action of the Image Recognition package with the <b>Right Click</b> selected from the <b>Action</b> list.

Play type	11.x Action	Automation 360 Action
	Double Click	Migrated to the <b>Find window in window</b> action of the Image Recognition package with the <b>Double Click</b> selected from the <b>Action</b> list.
	Middle Click	Migrated to the <b>Find window in window</b> action of the Image Recognition package with the <b>Left Click</b> selected from the <b>Action</b> list.
	Set Text	Migrated to: <ul style="list-style-type: none"> <li>• The <b>Find window in window</b> action of the Image Recognition package with the <b>Left Click</b> selected from the <b>Action</b> list.</li> <li>• The <b>Delay</b> action of the Delay package with the <b>Regular</b> delay set to 500 milliseconds.</li> <li>• The <b>Simulate keystrokes</b> action of the Simulate keystrokes package.</li> </ul>
	Get Text	Migrated to the <b>Capture area</b> action of the OCR package.

The following table provides information about the actions that are performed on an coordinate play type object available on the screen is migrated to the equivalent actions in Automation 360:

Play type	11.x Action	Automation 360 Action
Coordinate	Click	Migrated to the <b>Click</b> action of the Mouse package with the <b>Left Button</b> and <b>Click</b> options selected.
	Left Click	Migrated to the <b>Click</b> action of the Mouse package with the <b>Left Button</b> and <b>Click</b> options selected.
	Right Click	Migrated to the <b>Click</b> action of the Mouse package with the <b>Right Button</b> and <b>Click</b> options selected.
	Middle Click	Migrated to the <b>Click</b> action of the Mouse package with the <b>Middle Button</b> and <b>Click</b> options selected.

Play type	11.x Action	Automation 360 Action
	Double Click	Migrated to the <b>Click</b> action of the Mouse package with the <b>Left Button</b> and <b>Double click</b> options selected.
	Set text	Migrated to: <ul style="list-style-type: none"> <li>• The <b>Click</b> action of the Mouse package with the <b>Left Button</b> and <b>Click</b> options selected.</li> <li>• The <b>Delay</b> action of the Delay package with the <b>Regular</b> delay set to 500 milliseconds.</li> <li>• The <b>Simulate keystrokes</b> action of the Simulate keystrokes package.</li> </ul>
	Get text	Migrated to: <ul style="list-style-type: none"> <li>• The <b>Click</b> action of the Mouse package with the <b>Left Button</b> and <b>Click</b> options selected.</li> <li>• The <b>Clear</b> action of the Clipboard package.</li> <li>• The <b>Delay</b> action of the Delay package with the <b>Regular</b> delay set to 500 milliseconds.</li> <li>• The <b>Simulate keystrokes</b> action of the Simulate keystrokes package.</li> <li>• The <b>Delay</b> action of the Delay package with the <b>Regular</b> delay set to 500 milliseconds.</li> <li>• The <b>Copy to</b> action of the Clipboard package.</li> </ul>

## Migration of logic

Each logic in a MetaBot is converted to a TaskBot and each command used in a logic is converted to the equivalent action in Automation 360. The variable used in a logic is converted to an equivalent variable in Automation 360. Credential variables used in the logic are migrated to Automation 360 and used in the equivalent actions in the migrated bots. If the **Parameter Type** of a variable is input or output, the same is maintained after that variable is migrated to Automation 360. For example, if the **Parameter Type** of the variable ABC is set as **Input**, the variable ABC created in Automation 360 has the **Use as input** option selected after it is migrated. The system retains the internal folder structure of the logics. For the above example, all the migrated logics are stored as listed in the following table:

Folder	Entry
MetaTask	Common
MetaTask\Logic	Connect
MetaTask\Logic	Disconnect
MetaTask\Logic\Operations	Numeric

## Migration of Run Logic command

The **Run Logic** command is used in a bot to run a specific logic from a MetaBot in 11.x. When you migrate that bot, the **Run Logic** command is converted to the **Run** action of the Task Bot package.

The input variables are converted to equivalent variables in Automation 360 and the output variables are migrated to a dictionary variable. You use the key in the dictionary variable to use the associated value. The dictionary variable might contain other variable types, for example, list, value, integer, and array. You can map the variables available in the dictionary variable with other variable types. For example, you can map the list type variable available in the dictionary variable with the list, value, and array type variables.

## Migration of Execute command

The DLLs in the MetaBots use the **Execute** command to run a function from that DLL. After migration to Automation 360, each **Execute** command is converted to **Open**, **Run function**, and **Close** actions of the **DLL** package. Information about which function to run from the DLL, which parameters to use, and other details in the **Execute** command is migrated to the **Run** action.

Starting from Enterprise A2019.16 (6448), you can migrate MetaBots that contain DLLs whose return types are different from that of the MetaBot. The following table provides information about the variable type of the output of the MetaBot and the return type of a DLL.

MetaBot variable type	DLL function return type
Value	Two-dimensional array, List, Byte in array (Byte[]), unsigned integers (UInt32, UInt64), signed integers, IDictionary, IList, and unsigned integers in array (UInt16[], UInt32[], UInt64[]), signed Byte
Array	Two-dimensional array, List, unsigned integers (UInt16[], UInt32, UInt64), signed integers, IList, signed Byte and IDictionary

**Note:** The migration of bots that uses IDictionary variable is supported, however, the migrated bots might not return the correct value. This behavior is same as in 11.x or 10.x.

The following table provides information about the variable type that is passed from the MetaBot and the input type a DLL accepts.

Variable type of MetaBot	Input variable type the DLL accepts
List	Two-dimensional array, list, byte, unsigned integers (UInt16, UInt32, UInt64), signed integers, signed Byte, byte in array (Byte[]), and unsigned integers in array (UInt16[], UInt32[], UInt64[])
Array	Two-dimensional array, list, byte, unsigned integers (UInt16, UInt32, UInt64), signed integers, signed Byte, byte in array (Byte[]), and unsigned integers in array (UInt16[], UInt32[], UInt64[])
Value	Byte, unsigned integers (UInt16, UInt32, UInt64), signed integers, signed Byte
Dictionary	Byte, unsigned integers (UInt16, UInt32, UInt64), signed integers, signed Byte

## Enable schedules after migration

When you copy 10.x data to Automation 360, the 10.x schedules are migrated. Version 11.x schedules are migrated when you update the 11.x data to Automation 360.

After you migrate a bot associated with a schedule, the system automatically replaces the .atmx bot within that schedule with the Automation 360 bot. Migrated schedules are inactive and do not have associated devices, so some dependencies must be remapped in the Automation 360 environment.

To reenable migrated schedules, follow these steps:

1. Confirm that the bot linked to the schedule has been successfully migrated.  
Migrated schedules only point to successfully migrated bots. If a bot migration fails, then the associated schedule continues pointing to the .atmx bot.
2. Install the Bot agent on your Bot Runner devices.  
[Install Bot agent and register device](#)
3. Edit the schedule to add relevant devices.  
[Schedule a bot](#)
4. Enable the schedule by clicking **Enable** after you have provided the required information for scheduling a bot.  
[Schedule a bot](#)

### Related concepts

#### [Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

### Related tasks

#### [Copy 10.x data](#)

You must copy the 10.x data to Automation 360 before you convert the 10.x bots.

#### [Copy and paste 11.x information to Automation 360](#)

The 11.x server repository files and the Credential Vault file are required in the Automation 360 environment. The most efficient way to get this data is to copy it from the 11.x environment into Automation 360.

### [Migrate Enterprise bots](#)

The bot migration process uses the Bot Migration Wizard to convert 11.x or 10.x bots (TaskBots and MetaBots) in `.atmx` and `.mbot` format to the `.bot` format used in Automation 360 and uploads the successfully migrated bots to the Control Room public workspace.

## Pause and resume bot migration

You can pause and then resume the paused bot migration. You might want to pause a bot migration if you want to perform a high-priority task on the same Bot Runner device on which the bot migration is running.

You must have the required permissions to start bot migration.

- Pause and resume bot migration when only one Bot Runner is used for bot conversion:
  - a) Select the active bot migration you want to pause from the **Activity > In progress** page.
  - b) Click the pause icon in the bot Launcher or on the **In progress** page.

The system pauses the bot migration. The status of bot migration is listed on the following:

    - The **Activity > In progress** page and marked as paused.
    - The bot migration on the **Administration > Migrations** page, where the status is displayed as paused.
    - The **Bot migration report** tab, where the status of the bot that was being converted and the bot migration that was paused is set as paused. The status of all other bots that were not converted is set as pending.
  - c) Select the paused bot migration that you want to resume from the **Activity > In progress** page.
  - d) Click the resume icon in the bot Launcher or on the **In progress** page.

The system resumes the paused bot migration. The details status of the resumed bot migration is available on the following:

    - The **Activity > In progress** page where the status is marked as active.
    - The **Administration > Migrations** page where the status is marked as in progress.
    - The **Bot migration report** tab, where the status of the bot that was being converted and the bot migration was paused is set as in progress.

- Pause and resume bot migration on some of the Bot Runners when multiple Bot Runners are used for bot conversion:
  - a) Select the active bot migration you want to pause from the **Activity > In progress** page.
  - b) Click the pause icon on the toolbar to pause the selected migration processes.  
The system pauses the selected migration processes that were running on various Bot Runners. The status of the paused bot migration is displayed on the **Activity > In progress** page and marked as paused.  
  
There is no change in the status of the bot migration on the **Administration > Migrations** page and on the **Bot migration report** tab.
  - c) Select the paused bot migrations you want to resume from the **Activity > In progress** page.
  - d) Click the resume icon on the toolbar to resume the selected paused bot migration.  
The system resumes the bot migration for the selected Bot Runners. The status of Bot Runners for which the bot migration is resumed is displayed on the **Activity > In progress** page and marked as active.  
  
The status of the bot migration on the **Administration > Migrations** page is displayed as in progress.
  
- Pause a bot migration for all Bot Runners when multiple Bot Runners are used for bot conversion.
  - a) Select all the active bot migration you want to pause from the **Activity > In progress** page.
  - b) Click the pause icon on the toolbar to pause the selected bot migration.  
The system pauses the selected bot migrations that were running on various Bot Runners. The entry for all the paused migration processes is available on the following:
    - The **Activity > In progress** page and marked as paused.
    - The **Administration > Migrations** page where it is displayed as paused.
    - The **Bot migration report** tab, where the status of the bots for which migration has not started is set as paused.
  - c) Select all the paused bot migration you want to resume from the **Activity > In progress** page.
  - d) Click the resume icon in the bot Launcher or on the **In progress** page for all Bot Runners.  
The system resumes the paused the bot migration. The status for all the Bot Runners is available on the following:
    - The **Activity > In progress** page and marked as active.
    - The **Administration > Migrations** page where it is displayed as in progress.
    - The **Bot migration report** tab, where the status of the bot that was being converted and the bot migration was paused is set as in progress.

## Stop bot migration

You can stop an in-progress bot migration if that bot migration is not progressing or is not responding.

You must have the required permissions to start bot migration.

1. Select the active bot migration that you want to stop from the **Activity > In progress** page.

2. Click the stop icon in the bot Launcher or on the **In progress** page.  
The system immediately terminates the bot migration. The status of the stopped bot migration is listed on the following:
  - The **Activity > Historical** page and marked as failed.
  - The **Administration > Migrations** page, where it is displayed as unsuccessful.
  - The **Bot migration report** tab, where the status of the bot that was being converted and the migration process that was stopped is set as unsuccessful. The status of all other bots that were not converted is set as pending.
  - The **View historical activity** page for the entry shows the reason for the failure.

## Validating and updating bots after migration

Migrated bots are uploaded to the public repository of the Automation 360 Control Room (in the same folder containing the equivalent .atmx files). You can review the current status of the migrated bots and any errors encountered due to unsupported commands or attributes available in those bots from the **Migration List** page.

It is important that you review, test, and verify all migrated bots to ensure that they run successfully in the Automation 360 environment. Using the Migration Assistant, view the list of changes that were made to each bot. Before testing any bot, scroll through the entire migrated bot from the first to last line so that the Migration Assistant flags any issues.

If you do not review the entire bot, you might see a `failed to compile` error.

### Updating your bots

If a bot requires any modifications based on the migration reports or testing phase, you can edit the bot:

1. Check out the bot from the public repository into a private repository.
2. Use the Migration Assistant to view changes to migrated bots.

The Migration Assistant will guide you for any required changes and provide opportunities to leverage new Automation 360 features.

3. Edit the bot in the Bot editor if required.

You can run the bot directly from the Bot editor as you modify your bot and test the process steps.

Perform these steps in your Development (DEV) environment. After the migrated bots clear your preset pass criteria, move them to the User Acceptance Testing (UAT) environment to test the bots against production-like systems with larger datasets.

Only when the bot clears the UAT requirements should you deploy it in a Production (PROD) environment. This process is part of the typical industry standard software development lifecycle (SDLC) best practices.

### Moving bots using Bot Lifecycle Management

Use Bot Lifecycle Management to move bots from one environment to another. After you have tested and successfully run the migrated bots in the DEV environment, you can use Bot Lifecycle Management to move the bots from the DEV environment to the UAT environment. Similarly, you use Bot Lifecycle Management to move the bots from the UAT environment to the PROD environment.

## Package mapping for migration

This page contains information about 10.x and 11.x commands and how they map to respective Automation 360 actions or packages. In some cases, a 10.x or 11.x command migrates to more than one Automation 360 action. This is to ensure that the behavior of the migrated bot is unchanged.

Automation 360 has a new package called **Legacy automation**. This package provides the additional support needed during migration. The **Legacy automation** package is for use during migration only; we do **not** recommend using this package for new bot development. [Legacy Automation package](#)

You can migrate bots when the user doing the migration is using an authenticated proxy server.

The following are some key behavior differences:

- In Automation 360, the single dollar sign (\$) is reserved for Automation Anywhere use, so all user entries of a single dollar sign are automatically replaced with two dollar signs (\$\$). For example, if you have a text field, "Pay \$5.00", we convert that field to read "Pay \$\$5.00" in Automation 360 for it to display properly to users.
- For MetaBots, the migration process migrates the DLLs and logic to equivalent bots. The **Run Logic** command is converted to the **Run** action of the Task Bot package.

The DLLs in the MetaBots use the **Execute** command to run a function from that DLL. After migration to Automation 360, each **Execute** command is converted to **Open**, **Run function**, and **Close** actions of the **DLL** package. Information about which function to run from the DLL, which parameters to use, and other details in the **Execute** command is migrated to the **Run** action. MetaBots with DLLs that use credential variables of string, character, and Byte data type can be migrated to Automation 360.

Earlier to A2019.17, the dictionary variable was used to provide input parameters in a migrated bots which used to add additional steps in the bot. From A2019.17 onward, the Entrylist variable is used to provide input parameters in a migrated bot. This reduces the number of steps added to the migrated bot.

### *How MetaBots are migrated*

- For 10.x/11.x command using a windows title field configured with a user defined variable, the migration process migrates the bot by adding the **Set Title** action just above the respective command. Automation 360 does not allow user variables in the **Windows Title** field. Use the **Set Title** action to achieve the same behavior.
- In 11.x, when a bot contains more than one command with the **resize window** option selected, the window is resized to the dimensions specified by the first command. In Automation 360, the window is resized each time the bot encounters an action with the **resize window** option selected. This ensures that at runtime the window dimensions of each action match the dimensions at which that action was configured, which enhances the bot's ability to find the object.
- 10.x/11.x provides various pre-sets as part of the windows title selection and they are migrated to respective pre-sets in Automation 360.

10.x/11.x Options	Automation 360 Options
Current Active Window	Current Active Window

10.x/11.x Options	Automation 360 Options
Desktop	<ul style="list-style-type: none"> <li>For the <b>Insert mouse click</b> command, use the <b>Screen for window title</b> option.</li> <li>For the <b>Insert keystroke</b> command, use the <b>Current Active Window</b> option.</li> <li>For <b>Screen &gt; Capture area</b>, use the <b>Screen for window title</b> option.</li> <li>For the <b>Capture Desktop</b> command of the Screen Capture command, use the <b>Capture area</b> action of the Screen package with the <b>Screen</b> option selected from the list available in the <b>Application</b> tab.</li> </ul>
Wallpaper	Desktop
Taskbar	Taskbar

- In 10.x/11.x, loop indexing of table starts with 1 and increments by 1. Automation 360 starts indexing with 0 and increments by 1.
- For each variable passed as input in 11.x or 10.x bot, a line is added in the migrated bot in Automation 360. For example, if you are passing 100 variable as input in 11.x bot, after migration that bot has 100 new lines.
- 11.x or 10.x allows you to specify a session name to open a file or establish a connection and use a variable in a loop command to use the same session. After migrating these bots to Automation 360, you must update the bot to use either a session name or variable to open a file and in a loop command.
- 10.x/11.x actions that store the return values to the \$Clipboard\$ system variable are not supported in A2019. When you migrate bots with this functionality, the migration process assigns the values to a temporary variable and then assigns the value to the Automation 360 \$System:Clipboard\$ system variable by adding the **Copy To** action to the **Clipboard** package.
- The migration process migrates IF and Loop commands that contain multiple conditions of a variable.
- In 10.x/11.x, some String operation commands use Tab, Enter, and Separator special characters. In Automation 360, these characters are system variables in the String package.

10.x/11.x	Automation 360
[Tab]	\$String:Tab\$
[Enter]	\$String:Enter\$
[Separator]	\$String:Separator\$

See [String package](#).

- In 11.x/10.x, bots can use a variable to specify the child bot you want to run. In Automation 360, the task path is updated to the `Bots` folder. The following table provides a few examples:

11.x/10.x	Automation 360
D:\My Documents \AAE_V11\Automation Anywhere Files\Automation Anywhere\My Tasks\Migration\\${bot_name}	Bots\My Tasks\Migration\\${bot_name}\$
\$AAApplicationpath\$\Automation Anywhere\My Tasks\Migration\ \${bot_name}	Bots\My Tasks\Migration\\${bot_name}\$

11.x/10.x	Automation 360
D:\\$UserName\$\My Documents \AAE_V11\Automation Anywhere Files\Automation Anywhere\My Tasks\Migration\\${bot_name}\$	Bots\My Tasks\Migration\\${bot_name}\$
D:\My Documents \AAE_V11\Automation Anywhere Files\Automation Anywhere\ \${bot_path}\\${bot_name}\$	Bots\My Tasks\\${bot_path}\ \${bot_name}\$

- Some commands return values to variables for further processing. In 10.x/11.x, users can store these values in different types of variables, where as in Automation 360, these values are stored in a specific type of variable only.  
For example, if a command returns a value to an array for a specific cell, then in Automation 360, we store the value in a temporary string variable. Then in the next action, we store this temporary value to an actual array variable to ensure that the bot execution logic stays intact.
- Disabled commands are migrated as follows based on the different coding patterns:
  - An individually disabled command (with or without any validation error) is migrated as a disabled action. All actions are disabled if one disabled command is migrated to multiple actions in Automation 360.
  - Disabled **Error Handling** command is migrated to disabled try and catch block including all other actions depending on its configuration.
  - Disabled **Loop** command is migrated to a disabled **Loop** action in Automation 360.
  - Disabled **If** command is migrated as a comment if the command has a complex structure because of **Else/If** and **Else** commands. We migrate them as a comment to make sure the migrated bot returns the same result as 10.x/11.x bots.

The following table lists the packages available for migration and how they map to Automation 360. N/A means there are no changes. Automation 360.

Package	How it is migrated to Automation 360	What you need to do
Active Directory	<p>Respective <b>Active Directory</b> commands are migrated to the <b>Connect</b> and <b>Disconnect</b> actions. Each command is migrated as follows:</p> <ul style="list-style-type: none"> <li>• <b>Create user</b> command is migrated to the <b>Create user</b> action.</li> <li>• <b>Modify group</b> command with the <b>Rename group</b> option is migrated to the <b>Rename group</b> action.</li> <li>• <b>Modify group</b> command with the <b>Delete group</b> option is migrated to the <b>Delete group</b> action.</li> <li>• <b>Modify group</b> command with the <b>Add users to group</b> option is migrated to the <b>Add users to group</b> action.</li> <li>• <b>Modify group</b> command with the <b>Remove users from group</b> option is migrated to the <b>Remove users from group</b> action.</li> <li>• <b>Modify group</b> command with the <b>Set property</b> option is migrated to the <b>Set group property</b> action.</li> <li>• <b>Modify group</b> command with the <b>Disable user account</b> option is migrated to the <b>Disable user account</b> action.</li> <li>• <b>Modify group</b> command with the <b>Update user details</b> option is migrated to the <b>Update user details</b> action.</li> <li>• <b>Modify user</b> command with the <b>Rename user</b> option is migrated to the <b>Rename user</b> action.</li> <li>• <b>Modify user</b> command with the <b>Delete user</b> option is migrated to the <b>Delete user</b> action.</li> <li>• <b>Modify user</b> command with the <b>Enable user account</b> option is migrated to the <b>Enable user account</b> action.</li> <li>• <b>Modify user</b> command with the <b>Update Account Options</b> option is migrated to the <b>Update account options</b> action.</li> <li>• <b>Modify user</b> command with the <b>Change Password</b> option is migrated to the <b>Change user password</b> action.</li> <li>• <b>Create object</b> command with the <b>Computer object</b> option is migrated to the <b>Create computer</b> action.</li> <li>• <b>Create object</b> command with the <b>Organizational unit object</b> option is migrated to the <b>Create organizational unit</b> action.</li> <li>• <b>Search</b> command with the <b>Run Query</b> option is migrated to the <b>Run query</b> action.</li> <li>• <b>Search</b> command with the <b>Get all users of a Group</b> is migrated as <b>Get all users of a group</b>.</li> <li>• <b>Get property</b> command with the <b>User</b> option is migrated to the <b>Get user property</b> action.</li> <li>• <b>Get property</b> command with the <b>Group</b> option is migrated to the <b>Get group property</b> action.</li> <li>• <b>Get property</b> command with the <b>Computer</b> option is migrated to the <b>Get computer property</b> action.</li> <li>• <b>Get property</b> command with the <b>Organizational unit</b> option is migrated to the <b>Get organizational unit property</b> action.</li> <li>• The options in the <b>Modify Object</b> command with <b>Computer</b> object type are migrated as follows: <ul style="list-style-type: none"> <li>• <b>Rename Object</b> option is migrated to the <b>Rename computer</b> action</li> </ul> </li> </ul>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do
App Integration	<p><b>App Integration</b> in Automation 360 does not have actions for each technology, unlike in 10.x/11.x. In Automation 360, all actions are divided into individual actions.</p> <p><b>Capture text from</b></p> <p>All 10.x/11.x <b>App Integration</b> commands that capture text from a window is migrated to the <b>App Integration &gt; Capture text from window</b> action in Automation 360.</p> <p><b>Capture area</b></p> <p>The 10.x/11.x <b>Capture area</b> command behaves inconsistently, sometime returning the output result of an entire window instead of the selected area and sometime returning no text. In Automation 360, this action consistently returns the selected area text.</p> <p><b>Capture scrollable text</b></p> <p>All the 10.x/11.x <b>App Integration</b> commands that capture text from an application window with a vertical scroll bar is migrated to the <b>App integration &gt; Capture scrollable text</b> action in Automation 360. The captured images are also migrated.</p> <p><i>App Integration package</i></p>	N/A – the migration process maps the fields automatically.
Clipboard	<p>All commands of Clipboard are migrated to equivalent actions of the Automation 360 <b>Clipboard</b> package. There is no change in behavior or command name.</p> <p>See <i>Clipboard package</i>.</p>	N/A – the migration process maps the fields automatically.
Comment	Comment is migrated to Automation 360 <b>Comment</b> action.	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do						
Database	<p>10.x/11.x uses ODBC drivers and Automation 360 uses JDBC drivers.</p> <p>The <b>SQL Query</b> action is called <b>Read from</b> in Automation 360.</p> <p>The following table shows the commands that currently can be migrated.</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Connect</td> <td> Migrates to the <b>Connect</b> command. If you encounter an unsupported connection string in Automation 360, the reasons might vary based on your environment. More details are available as part of the migration process. Contact Technical Support if you need assistance resolving the issue.  <p>0 is not a valid time out value in Automation 360. The migration process replaces 0 with an empty value.</p> </td> </tr> <tr> <td>Run Stored Procedure</td> <td> The parameter name and output parameter are mandatory fields in Automation 360. </td> </tr> </tbody> </table> <p>See <a href="#">Database package</a>.</p>	10.x/11.x	Automation 360	Connect	Migrates to the <b>Connect</b> command. If you encounter an unsupported connection string in Automation 360, the reasons might vary based on your environment. More details are available as part of the migration process. Contact Technical Support if you need assistance resolving the issue. <p>0 is not a valid time out value in Automation 360. The migration process replaces 0 with an empty value.</p>	Run Stored Procedure	The parameter name and output parameter are mandatory fields in Automation 360.	<p><b>Run stored procedure</b></p> <p>After you migrate the bot, you must provide the parameter name and output parameter type.</p> <p>N/A – the migration process maps the fields automatically.</p>
10.x/11.x	Automation 360							
Connect	Migrates to the <b>Connect</b> command. If you encounter an unsupported connection string in Automation 360, the reasons might vary based on your environment. More details are available as part of the migration process. Contact Technical Support if you need assistance resolving the issue. <p>0 is not a valid time out value in Automation 360. The migration process replaces 0 with an empty value.</p>							
Run Stored Procedure	The parameter name and output parameter are mandatory fields in Automation 360.							
Delay	<p>Delay command is migrated to the <b>Delay</b> action in Automation 360. "Delay in Milliseconds" and "Delay in Seconds" options (11.x) have changed to radio options within the <b>Time unit</b> area (Automation 360). See <a href="#">Delay package</a>.</p>	<p>N/A – the migration process maps the fields automatically.</p>						
Email	<p>There are no sessions for Email commands in 10.x or 11.x. However, Automation 360 includes <b>Connect</b> and <b>Disconnect</b> actions to ensure email sessions are started and closed. Therefore, during migration, the <b>Connect</b> action is placed before the respective email action and the <b>Disconnect</b> action after the respective email action.</p> <p>The <b>Save attachment</b> option of the <b>Get All Messages</b> command is now a dedicated action called <b>Save attachment</b> in the <b>Email</b> package in Automation 360.</p> <p>For bots created to automate email-related tasks on the Exchange Web Services (EWS) server, the <b>Get All Message</b> command is migrated to the <b>Loop</b> action with the iteration set to <b>For all each mail in mailbox</b>. Similarly, the <b>Delete</b> and <b>Delete all</b> commands are migrated to <b>Delete</b> and <b>Delete all</b> actions.</p> <p>See <a href="#">Email package</a>.</p>	<p>N/A – the migration process maps the fields automatically.</p>						

Package	How it is migrated to Automation 360	What you need to do				
Error Handling	<p>Disabled Error Handling commands are not migrated to Automation 360.</p> <p><b>Begin Error Handling</b> and <b>End Error Handling</b> is migrated to the <b>Try/Catch</b> block of the Error handler package in Automation 360. Many options available in Begin Error Handling are migrate to respective Automation 360 actions. Refer the below table for details:</p>	N/A – the migration process maps the fields automatically.				
	<table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Continue</td> <td>By default, execution continues after executing the <b>Catch</b> block in Automation 360.</td> </tr> </tbody> </table>		10.x/11.x	Automation 360	Continue	By default, execution continues after executing the <b>Catch</b> block in Automation 360.
	10.x/11.x		Automation 360			
	Continue		By default, execution continues after executing the <b>Catch</b> block in Automation 360.			
<table border="1"> <tbody> <tr> <td>Stop</td> <td><b>Stop</b> action of the <b>Task</b> package is added in the <b>Catch</b> block.</td> </tr> </tbody> </table>	Stop	<b>Stop</b> action of the <b>Task</b> package is added in the <b>Catch</b> block.				
Stop	<b>Stop</b> action of the <b>Task</b> package is added in the <b>Catch</b> block.					
<table border="1"> <tbody> <tr> <td>Take Snapshot</td> <td> <p>When the <b>Take Snapshot</b> option is selected and the location is provided in the <b>File Path</b> field of the 11.x bot, the migrated bot contains:</p> <ul style="list-style-type: none"> <li>• The <b>Capture desktop</b> action of the Screen package to capture the error screen.</li> <li>• The <b>Log to file</b> action of the Log To File package to capture the error message in a text file.</li> <li>• The <b>To string</b> action of the Datetime package to convert the datetime value to string that will be stored in the text file along with the error message.</li> </ul> <p>The above actions are added in the <b>Catch</b> block of the migrated bot and the captured image and the error message are stored at the location provided in the <b>File Path</b> field of the 11.x bot.</p> <p>When the <b>Take Snapshot</b>, <b>Send Email</b>, and <b>Attach Sanpshot</b> options are selected and the location is not provided in the <b>File Path</b> field in the 11.x bot, the migrated bot contains the</p> </td> </tr> </tbody> </table>	Take Snapshot	<p>When the <b>Take Snapshot</b> option is selected and the location is provided in the <b>File Path</b> field of the 11.x bot, the migrated bot contains:</p> <ul style="list-style-type: none"> <li>• The <b>Capture desktop</b> action of the Screen package to capture the error screen.</li> <li>• The <b>Log to file</b> action of the Log To File package to capture the error message in a text file.</li> <li>• The <b>To string</b> action of the Datetime package to convert the datetime value to string that will be stored in the text file along with the error message.</li> </ul> <p>The above actions are added in the <b>Catch</b> block of the migrated bot and the captured image and the error message are stored at the location provided in the <b>File Path</b> field of the 11.x bot.</p> <p>When the <b>Take Snapshot</b>, <b>Send Email</b>, and <b>Attach Sanpshot</b> options are selected and the location is not provided in the <b>File Path</b> field in the 11.x bot, the migrated bot contains the</p>				
Take Snapshot	<p>When the <b>Take Snapshot</b> option is selected and the location is provided in the <b>File Path</b> field of the 11.x bot, the migrated bot contains:</p> <ul style="list-style-type: none"> <li>• The <b>Capture desktop</b> action of the Screen package to capture the error screen.</li> <li>• The <b>Log to file</b> action of the Log To File package to capture the error message in a text file.</li> <li>• The <b>To string</b> action of the Datetime package to convert the datetime value to string that will be stored in the text file along with the error message.</li> </ul> <p>The above actions are added in the <b>Catch</b> block of the migrated bot and the captured image and the error message are stored at the location provided in the <b>File Path</b> field of the 11.x bot.</p> <p>When the <b>Take Snapshot</b>, <b>Send Email</b>, and <b>Attach Sanpshot</b> options are selected and the location is not provided in the <b>File Path</b> field in the 11.x bot, the migrated bot contains the</p>					

Package	How it is migrated to Automation 360	What you need to do														
Excel	<p>The 10.x/11.x Excel commands are migrated to respective Automation 360 actions of the <b>Excel Advanced</b> package.</p> <p>In 11.x, a bot can open a Microsoft Excel spreadsheet even when a file extension is not provided. In Automation 360, the migrated bots uses the <b>Open</b> action in the Excel advanced package to open a Microsoft Excel spreadsheet when a file extension is not provided.</p> <p>In 10.x/11.x, data returned by <b>Get Multiple Cells</b> and <b>Get All Cells</b> commands are returned to the <b>Loop &gt; Each Row in an Excel Dataset</b> command. In Automation 360, the functionalities of <b>Get Multiple Cell</b> and <b>Get All Cells</b> are available in <b>Loop &gt; Each Row in an Excel Dataset</b> action, so values from these commands are migrated to the loop instead of actual actions.</p> <p>Bots that use the <b>Get Single Cell</b> command with the <b>Specific cell</b> and <b>Get Cell Value</b> options are migrated to the <b>Get single cell</b> action of the Excel advanced package with the <b>Specific cell</b> and <b>Read cell value</b> options selected after migration.</p> <p>The following table shows action name changes:</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Save Spreadsheet</td> <td>Save workbook</td> </tr> <tr> <td>Open Spreadsheet</td> <td>Open</td> </tr> <tr> <td>Close Spreadsheet</td> <td>Close</td> </tr> <tr> <td>Get Cells</td> <td>Divided into <b>Get single cell</b> and <b>Get multiple cells</b> actions</td> </tr> <tr> <td>Activate Sheet</td> <td>Switch to sheet</td> </tr> <tr> <td>Find/Replace</td> <td>Divided into <b>Find</b> and <b>Replace</b> actions</td> </tr> </tbody> </table> <p>See <a href="#">Excel advanced package</a>.</p> <p>In 11.x or 10.x and in Automation 360, a session (used to open a Microsoft Excel spreadsheet) can be shared between the parent bot and a child bot. In Automation 360, you can close a shared session from the child bot.</p>	10.x/11.x	Automation 360	Save Spreadsheet	Save workbook	Open Spreadsheet	Open	Close Spreadsheet	Close	Get Cells	Divided into <b>Get single cell</b> and <b>Get multiple cells</b> actions	Activate Sheet	Switch to sheet	Find/Replace	Divided into <b>Find</b> and <b>Replace</b> actions	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360															
Save Spreadsheet	Save workbook															
Open Spreadsheet	Open															
Close Spreadsheet	Close															
Get Cells	Divided into <b>Get single cell</b> and <b>Get multiple cells</b> actions															
Activate Sheet	Switch to sheet															
Find/Replace	Divided into <b>Find</b> and <b>Replace</b> actions															

Package	How it is migrated to Automation 360	What you need to do																														
File/Folder	<p>All commands of <b>File/Folder</b> have been split into <b>File</b> and <b>Folder</b> packages.</p> <p>The following <b>File</b> related actions have changed in Automation 360:</p> <table border="1"> <thead> <tr> <th>11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Copy Files</td> <td>Copy action of the File package</td> </tr> <tr> <td>Create Files</td> <td>Create action of the File package</td> </tr> <tr> <td>Delete Files</td> <td>Delete action of the File package</td> </tr> <tr> <td>Open Files</td> <td>Open action of the File package</td> </tr> <tr> <td>Print Files</td> <td>Print action of the File package</td> </tr> <tr> <td>Rename Files</td> <td>Rename action of the File package</td> </tr> <tr> <td>Unzip Files</td> <td>Unzip action of the Folder package</td> </tr> <tr> <td>Zip Files</td> <td>Zip action of the Folder package</td> </tr> </tbody> </table> <p>The following <b>Folder</b> related actions have changed in Automation 360:</p> <table border="1"> <thead> <tr> <th>11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Copy Folder</td> <td>Copy action of the Folder package</td> </tr> <tr> <td>Create Folder</td> <td>Create action of the Folder package</td> </tr> <tr> <td>Delete Folder</td> <td>Delete action of the Folder package</td> </tr> <tr> <td>Open Folder</td> <td>Open action of the Folder package</td> </tr> <tr> <td>Rename Folder</td> <td>Rename action of the Folder package</td> </tr> </tbody> </table> <p>See <a href="#">File package</a>) and <b>Folder</b> and <a href="#">Folder package</a>.</p> <p>11.x bots can use regular expressions in the <b>Copy Files</b>, <b>Delete Files</b>, <b>Print Multiple Files</b>, <b>Rename Files</b>, and <b>Zip Files</b> commands to search for files on which you want to perform an operation. The equivalent actions in Automation 360 too can use regular expressions to search for files on which you want to perform an operation.</p>	11.x	Automation 360	Copy Files	Copy action of the File package	Create Files	Create action of the File package	Delete Files	Delete action of the File package	Open Files	Open action of the File package	Print Files	Print action of the File package	Rename Files	Rename action of the File package	Unzip Files	Unzip action of the Folder package	Zip Files	Zip action of the Folder package	11.x	Automation 360	Copy Folder	Copy action of the Folder package	Create Folder	Create action of the Folder package	Delete Folder	Delete action of the Folder package	Open Folder	Open action of the Folder package	Rename Folder	Rename action of the Folder package	N/A – the migration process maps the fields automatically.
11.x	Automation 360																															
Copy Files	Copy action of the File package																															
Create Files	Create action of the File package																															
Delete Files	Delete action of the File package																															
Open Files	Open action of the File package																															
Print Files	Print action of the File package																															
Rename Files	Rename action of the File package																															
Unzip Files	Unzip action of the Folder package																															
Zip Files	Zip action of the Folder package																															
11.x	Automation 360																															
Copy Folder	Copy action of the Folder package																															
Create Folder	Create action of the Folder package																															
Delete Folder	Delete action of the Folder package																															
Open Folder	Open action of the Folder package																															
Rename Folder	Rename action of the Folder package																															

Package	How it is migrated to Automation 360	What you need to do
FTP/SFTP	<p>All commands of <b>FTP/SFTP</b> are migrated to equivalent Automation 360 actions of the <b>FTP/SFTP</b> package. There is no change in behavior or command name.</p> <p><b>Get files</b> and <b>Get folder</b> actions return runtime errors if they have additional criteria based on dates, which are provided as variables that have values in a format other than MM/DD/YYYY. You must fix such instances after bot migration. During the migration process, these two actions also add extra error handlers in the migrated bots when filtering is done on datetime.</p>	N/A – the migration process maps the fields automatically.
If/Else > Variable	<p><b>Variables containing string condition</b></p> <p>We migrate IF with the following operators as a String condition in Automation 360:</p> <ul style="list-style-type: none"> <li>• =</li> <li>• &lt; &gt;</li> <li>• Include</li> <li>• Does not Include</li> </ul> <p>For the <b>Random</b> variable of the <b>String</b> sub-type, Automation 360 adds the <b>Generate random string</b> action of the <b>String</b> package to generate a random string above the If condition and assigns the value to the respective migrated variable.</p> <p><b>Variable containing number condition</b></p> <p>We migrate IF with the following operators as a Number condition in Automation 360:</p> <ul style="list-style-type: none"> <li>• &gt;=</li> <li>• &lt;=</li> <li>• &gt;</li> <li>• &lt;</li> </ul> <p>For the <b>Random</b> variable of the <b>Number</b> sub-type, Automation 360 adds the <b>Assign a random number</b> action of the <b>Number</b> package to generate a random string above the If condition and assigns the value to the respective migrated variable.</p> <p><b>Value type variable containing date</b></p> <p>The system tries to evaluate if a condition on a variable has a date value. If found, it migrates IF with the Datetime condition in Automation 360. Otherwise, the system migrates it as a string or number condition based on the operator used. In those cases, you must change it to a date condition after the bot migration if a date operation is involved.</p> <p>Additionally, you might also need to change the date format to one that is compatible with your data. The default format used to convert a date to string is MM/dd/yyyy HH:mm:ss.</p> <p>See <a href="#">If package</a> .</p>	If a condition involves date, under certain situation, you must change the migrated information to a date condition after the bot migration.

Package	How it is migrated to Automation 360	What you need to do																						
If/Else (Other conditions)	<p>The table below shows how various conditions are migrated to the respective Automation 360 conditions.</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Task Successful or Task Unsuccessful</td> <td>Migrated to the equivalent <b>If</b> condition of <b>Task Bot</b> package.</td> </tr> <tr> <td>Script Successful or Script Unsuccessful</td> <td>Script successful/ unsuccessful is migrated to respective <b>If &gt; Script Successful</b> and <b>If &gt; Script Unsuccessful</b> actions of the <b>Legacy automation</b> package.</td> </tr> <tr> <td>Object Properties</td> <td>Migrated to the <b>If &gt; Condition &gt; Window Exists</b> and <b>Object</b> conditions of the <b>Recorder</b> package.</td> </tr> <tr> <td>Application Running or Application Not Running</td> <td>Migrated to the equivalent <b>If</b> condition of the <b>Application</b> package.</td> </tr> <tr> <td>File Exists, File Does Not Exist, File Date, File Size</td> <td>Migrated to the equivalent <b>If</b> condition of the <b>File</b> package.</td> </tr> <tr> <td>Folder Exists or Folder Does Not Exist</td> <td>Migrated to the equivalent <b>If</b> condition of the <b>Folder</b> package.</td> </tr> <tr> <td>Ping Successful Or Ping Unsuccessful</td> <td>Migrated to the equivalent <b>If</b> condition of the <b>Ping</b> package.</td> </tr> <tr> <td>Web Control Exists or Web Control Does Not Exist</td> <td>Migrated to the equivalent <b>If</b> condition of the <b>Legacy Automation</b> package.</td> </tr> <tr> <td>Window Exists/Window Does Not Exist</td> <td> <p>The following commands configured with the "Show child and hidden windows" option selected are migrated to the Automation 360 <b>Legacy Automation</b> package:</p> <ul style="list-style-type: none"> <li>• <b>If &gt; Condition &gt; Window Exists</b></li> <li>• <b>If &gt; Condition &gt; Window Does Not Exist</b></li> </ul> </td> </tr> <tr> <td>Logic Successful/Logic Unsuccessful</td> <td>The <b>If</b> command is migrated to <b>If &gt; Task Successful</b> and <b>If &gt; Task Unsuccessful</b> respectively</td> </tr> </tbody> </table>	10.x/11.x	Automation 360	Task Successful or Task Unsuccessful	Migrated to the equivalent <b>If</b> condition of <b>Task Bot</b> package.	Script Successful or Script Unsuccessful	Script successful/ unsuccessful is migrated to respective <b>If &gt; Script Successful</b> and <b>If &gt; Script Unsuccessful</b> actions of the <b>Legacy automation</b> package.	Object Properties	Migrated to the <b>If &gt; Condition &gt; Window Exists</b> and <b>Object</b> conditions of the <b>Recorder</b> package.	Application Running or Application Not Running	Migrated to the equivalent <b>If</b> condition of the <b>Application</b> package.	File Exists, File Does Not Exist, File Date, File Size	Migrated to the equivalent <b>If</b> condition of the <b>File</b> package.	Folder Exists or Folder Does Not Exist	Migrated to the equivalent <b>If</b> condition of the <b>Folder</b> package.	Ping Successful Or Ping Unsuccessful	Migrated to the equivalent <b>If</b> condition of the <b>Ping</b> package.	Web Control Exists or Web Control Does Not Exist	Migrated to the equivalent <b>If</b> condition of the <b>Legacy Automation</b> package.	Window Exists/Window Does Not Exist	<p>The following commands configured with the "Show child and hidden windows" option selected are migrated to the Automation 360 <b>Legacy Automation</b> package:</p> <ul style="list-style-type: none"> <li>• <b>If &gt; Condition &gt; Window Exists</b></li> <li>• <b>If &gt; Condition &gt; Window Does Not Exist</b></li> </ul>	Logic Successful/Logic Unsuccessful	The <b>If</b> command is migrated to <b>If &gt; Task Successful</b> and <b>If &gt; Task Unsuccessful</b> respectively	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360																							
Task Successful or Task Unsuccessful	Migrated to the equivalent <b>If</b> condition of <b>Task Bot</b> package.																							
Script Successful or Script Unsuccessful	Script successful/ unsuccessful is migrated to respective <b>If &gt; Script Successful</b> and <b>If &gt; Script Unsuccessful</b> actions of the <b>Legacy automation</b> package.																							
Object Properties	Migrated to the <b>If &gt; Condition &gt; Window Exists</b> and <b>Object</b> conditions of the <b>Recorder</b> package.																							
Application Running or Application Not Running	Migrated to the equivalent <b>If</b> condition of the <b>Application</b> package.																							
File Exists, File Does Not Exist, File Date, File Size	Migrated to the equivalent <b>If</b> condition of the <b>File</b> package.																							
Folder Exists or Folder Does Not Exist	Migrated to the equivalent <b>If</b> condition of the <b>Folder</b> package.																							
Ping Successful Or Ping Unsuccessful	Migrated to the equivalent <b>If</b> condition of the <b>Ping</b> package.																							
Web Control Exists or Web Control Does Not Exist	Migrated to the equivalent <b>If</b> condition of the <b>Legacy Automation</b> package.																							
Window Exists/Window Does Not Exist	<p>The following commands configured with the "Show child and hidden windows" option selected are migrated to the Automation 360 <b>Legacy Automation</b> package:</p> <ul style="list-style-type: none"> <li>• <b>If &gt; Condition &gt; Window Exists</b></li> <li>• <b>If &gt; Condition &gt; Window Does Not Exist</b></li> </ul>																							
Logic Successful/Logic Unsuccessful	The <b>If</b> command is migrated to <b>If &gt; Task Successful</b> and <b>If &gt; Task Unsuccessful</b> respectively																							

Package	How it is migrated to Automation 360	What you need to do
Image Recognition	<p>The <b>Image Recognition</b> command is split into <b>Find file image inside window image</b> and <b>Find window image inside another window image</b> actions in Automation 360.</p> <p>In Automation 360, Advance is the default comparison mode and actions with the Gray-Scale, Normal, or Monochrome option selected are migrated as <b>Advance</b>. The migration process maps the information automatically and does not impact related bots.</p> <p>Migration of bots with the <b>Image Recognition</b> command might fail if the command is using any file type other than:</p> <ul style="list-style-type: none"> <li>• .jpg</li> <li>• .jpeg</li> <li>• .jpe</li> <li>• .jfif</li> <li>• .bmp</li> <li>• .gif</li> </ul> <p>See <a href="#">Image Recognition package</a>.</p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do																												
Insert Keystrokes	<p>This command is called <b>Simulate Keystrokes</b> in Automation 360.</p> <p>The following keystroke conventions have changed:</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>[PAGE UP]</td> <td>[PAGE-UP]</td> </tr> <tr> <td>[NUM LOCK]</td> <td>[NUM-LOCK]</td> </tr> <tr> <td>[SCROLL LOCK]</td> <td>[SCROLL-LOCK]</td> </tr> <tr> <td>[PAGE DOWN]</td> <td>[PAGE-DOWN]</td> </tr> <tr> <td>[CAPS LOCK]</td> <td>[CAPS-LOCK]</td> </tr> <tr> <td>[UP ARROW]</td> <td>[UP-ARROW]</td> </tr> <tr> <td>[LEFT ARROW]</td> <td>[LEFT-ARROW]</td> </tr> <tr> <td>[RIGHT CLICK]</td> <td>[MENU]</td> </tr> <tr> <td>[RIGHT ARROW]</td> <td>[RIGHT-ARROW]</td> </tr> <tr> <td>[DOWN ARROW]</td> <td>[DOWN-ARROW]</td> </tr> <tr> <td>[ALT GR DOWN]</td> <td>[ALT-GR DOWN]</td> </tr> <tr> <td>[ALT GR UP]</td> <td>[ALT-GR UP]</td> </tr> <tr> <td>[\$]</td> <td>[DOLLAR]</td> </tr> </tbody> </table> <p>In 10.x/11.x, the delay time is divided by the total characters and applied between each character stroke. In Automation 360, the delay you specify applies to the time between each keystroke.</p> <p>If the <b>Encrypt Keystrokes</b> option is selected in 11.x or 10.x bots, after migration the value is stored in the Credential Vault. The migration process creates a locker in the Credential Vault with the following attributes:</p> <ul style="list-style-type: none"> <li>Name of the locker created in Automation 360 is name <code>AAE_&lt;folder_name&gt;</code> (folder_name is the folder in which the migrated bot is available). The migrated bot uses this locker. Users who have any permission for the folder that contains the bot can access the locker. The migration run-as user must have the <b>Create standard attributes for a credential</b> permission.</li> <li>A locker contains only one credential for each bot. The name of the credential created is <code>Keystrokes_&lt;bot name&gt;</code> for the TaskBots and <code>Keystrokes_&lt;Metabot name&gt;_&lt;Logic name&gt;</code> for MetaBots.</li> <li>Attributes for the locker are created with the name <code>Encrypted_keystrokes</code>.</li> </ul> <p>If a locker, credential, or attribute with the same name is already available, the system appends the locker name, credential name, and attribute name with a numeric value. For example, <code>AAE_&lt;folder_name&gt;_1</code>, <code>Keystrokes_&lt;bot</code></p>	10.x/11.x	Automation 360	[PAGE UP]	[PAGE-UP]	[NUM LOCK]	[NUM-LOCK]	[SCROLL LOCK]	[SCROLL-LOCK]	[PAGE DOWN]	[PAGE-DOWN]	[CAPS LOCK]	[CAPS-LOCK]	[UP ARROW]	[UP-ARROW]	[LEFT ARROW]	[LEFT-ARROW]	[RIGHT CLICK]	[MENU]	[RIGHT ARROW]	[RIGHT-ARROW]	[DOWN ARROW]	[DOWN-ARROW]	[ALT GR DOWN]	[ALT-GR DOWN]	[ALT GR UP]	[ALT-GR UP]	[\$]	[DOLLAR]	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360																													
[PAGE UP]	[PAGE-UP]																													
[NUM LOCK]	[NUM-LOCK]																													
[SCROLL LOCK]	[SCROLL-LOCK]																													
[PAGE DOWN]	[PAGE-DOWN]																													
[CAPS LOCK]	[CAPS-LOCK]																													
[UP ARROW]	[UP-ARROW]																													
[LEFT ARROW]	[LEFT-ARROW]																													
[RIGHT CLICK]	[MENU]																													
[RIGHT ARROW]	[RIGHT-ARROW]																													
[DOWN ARROW]	[DOWN-ARROW]																													
[ALT GR DOWN]	[ALT-GR DOWN]																													
[ALT GR UP]	[ALT-GR UP]																													
[\$]	[DOLLAR]																													

Package	How it is migrated to Automation 360	What you need to do
Launch Website	<p>This command is migrated to the <b>Open</b> action of the <b>Browser</b> package in Automation 360.</p> <p>Commands with "Edge" or "Override default browser" option deselected in the legacy product is automatically changed to use <b>Default Browser</b> after migration.</p> <p>11.x bots that open a website in a new window of all browsers supported by Automation 360 can be migrated. The 11.x bots that open the website in a new or an existing tab of the Internet Explorer browser can be migrated to Automation 360. The equivalent option to open the website in a new window, tab, or an existing tab is selected in the migrated bots.</p> <hr/> <p><b>Note:</b> The support for the Microsoft Edge Legacy browser is no longer available, whereas the Microsoft Edge Chromium browser is supported. As a result, you cannot create new bots using the Microsoft Edge Legacy browser. However, the existing bots created in Microsoft Edge Legacy browser can be updated using other supported browsers such as Google Chrome or Microsoft Edge Chromium browser.</p> <hr/> <p>See <a href="#">Browser package</a>.</p>	<p>N/A – the migration process maps the fields automatically.</p> <hr/> <p><b>Note:</b> If you have created bots in 10.x or 11.x using the Microsoft Edge browser, you must first port these bots to another browser, and then you can migrate them.</p> <hr/>
Log to File	<p>This command is migrated to <b>Log to file</b> action in Automation 360.</p> <p>See <a href="#">Log To File package</a>.</p>	<p>N/A – the migration process maps the fields automatically.</p>

Package	How it is migrated to Automation 360	What you need to do
Loop	<p>The following list explains how various iterator conditions of Loop are migrated to Automation 360.</p> <ul style="list-style-type: none"> <li>• Loop with <b>Times</b> is migrated to loop with <b>For n times</b> iterator of the <b>Loop</b> package.</li> <li>• Loop with <b>List</b> is migrated to loop with <b>For n times</b> iterator of the <b>Loop</b> package.</li> <li>• Loop with <b>Each Row in an Excel Dataset</b> is migrated to loop with <b>For each row in worksheet</b> iterator of the <b>Excel Advance</b> package. The system variable <b>\$Excel Column\$</b> used inside the loop is now a user defined variable specified in the same iterator.</li> <li>• Loop with <b>Each Row In A SQL Query Dataset</b> is migrated to loop with <b>For each row in a SQL query Dataset</b> iterator of the <b>Database</b> package. The system variable <b>\$Dataset Column\$</b> used inside the loop is now a user defined variable specified in the same iterator.</li> <li>• Loop with <b>Each File In A Folder</b> is migrated to loop with <b>For each file in a folder</b> iterator of the <b>File</b> package. The system variables <b>\$FileNames\$</b> and <b>\$Extensions\$</b> are now keys name and extension of a dictionary variable specified in the same iterator. In 11.x, the bots does not encounter an error if the folder does not exist. In Automation 360, the migrated bots encounter an error if the folder does not exist.</li> <li>• Loop with <b>Each Folder In A Folder</b> is migrated to loop with <b>For each folder in a folder</b> iterator of the <b>Folder</b> package. The system variable <b>\$Folder name\$</b> used inside the loop is now a user defined variable specified in the same iterator. In 11.x, the bots does not encounter an error if the folder does not exist. In Automation 360, the migrated bots encounter an error if the folder does not exist.</li> <li>• Loop with <b>Each Row In A CSV/Text File</b> is migrated to loop with <b>For each row in CSV/TXT</b> iterator of the <b>CSV/TXT</b> package. The system variable <b>\$Filedata Colum\$</b> used inside the loop is now a user defined variable specified in the same iterator.</li> <li>• Loop with <b>Each Email Message On Mail Server</b> is migrated to loop with <b>For each mail in mailbox</b> iterator of the <b>Email</b> package. The system variables <b>\$Email Cc\$, \$Email From\$, \$Email Message\$, \$Email Received Date\$, \$Email Received Time\$, \$Email Subject\$, and \$Email To\$</b> are now keys <b>emailCc, emailFrom, emailMessage, emailReceivedDate, emailReceivedTime, emailSubject, and emailTo</b> respectively of a dictionary variable specified in the same iterator.</li> <li>• Loop with <b>Each Node In An XML Database</b> is migrated to loop with <b>For each node in an XML database</b> iterator of the <b>XML</b> package. The system variable <b>\$XML Data Node\$</b> used inside the loop is now a user defined variable specified in the same iterator.</li> <li>• The following commands configured with the "Show child and hidden windows" option selected are migrated to the Automation 360 <b>Legacy Automation</b> package: <ul style="list-style-type: none"> <li>• Loop &gt; Condition &gt; Window Exists</li> </ul> </li> </ul>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do
Loop > Condition > Variable	<p><b>Variable containing string conditions</b></p> <p>We migrate IF with the following operators as a String condition in Automation 360:</p> <ul style="list-style-type: none"> <li>• =</li> <li>• &lt; &gt;</li> <li>• Include</li> <li>• Does not Include</li> </ul> <p>For the <b>Random</b> variable of the <b>String</b> sub-type, Automation 360 adds the <b>Generate random string</b> action of the <b>String</b> package to generate a random string above the If condition and assigns the value to the respective migrated variable.</p> <p><b>Variable containing number conditions</b></p> <p>We migrate IF with the following operators as a Number condition in Automation 360:</p> <ul style="list-style-type: none"> <li>• &gt;=</li> <li>• &lt;=</li> <li>• &gt;</li> <li>• &lt;</li> </ul> <p>For the <b>Random</b> variable of the <b>Number</b> sub-type, Automation 360 adds the <b>Assign a random number</b> action of the <b>Number</b> package to generate a random string above the If condition and assigns the value to the respective migrated variable.</p> <p><b>Variable containing date conditions</b></p> <p>The system tries to evaluate if a condition on a variable has a date value. If found, it migrates IF with the Datetime condition in Automation 360. Otherwise, the system migrates it as a string or number condition based on the operator used. In those cases, you must change it to a date condition after the bot migration if a date operation is involved.</p> <p>Additionally, you might also need to change the date format to one that is compatible with your data. The default format used to convert a date to string is <code>MM/dd/yyyy HH:mm:ss</code>.</p> <p><b>List type variable</b></p> <p>Loop on a variable condition of type List is migrated to either String or Number condition based on the operator used in the condition. The system uses the list index to validate the condition.</p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do																
Loop > Condition (other)	<p>Refer to the table below to see how various conditions are migrated to the respective Automation 360 conditions.</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Web Control Exists or Web Control Does Not Exist</td> <td>Migrated to the equivalent If condition of the <b>Legacy Support</b> package.</td> </tr> <tr> <td>Object Properties</td> <td>Migrated to the <b>Object</b> condition of the <b>Recorder</b> package.</td> </tr> <tr> <td>Application Running or Application Not Running</td> <td>Migrated to the equivalent If condition of the <b>Application</b> package.</td> </tr> <tr> <td>File Exists, File Does Not Exist, File Date, File Size</td> <td>Migrated to the equivalent If condition of the <b>File</b> package.</td> </tr> <tr> <td>Folder Exists or Folder Does Not Exist</td> <td>Migrated to the equivalent If condition of the <b>Folder</b> package.</td> </tr> <tr> <td>Ping Successful Or Ping Unsuccessful</td> <td>Migrated to the equivalent If condition of the <b>Ping</b> package.</td> </tr> <tr> <td>Service is running or Service is not running</td> <td>Migrated to the equivalent If condition of the <b>Service</b> package.</td> </tr> </tbody> </table> <p><b>Web Control Exists or Web Control Does Not Exist</b></p> <p>Loop with <b>Web control exists</b> and <b>Web control does not exist</b> conditions are migrated to <b>Loop &gt;</b> While conditions Web control exists and Web control does not exist of the <b>Legacy Automation</b> package respectively.</p>	10.x/11.x	Automation 360	Web Control Exists or Web Control Does Not Exist	Migrated to the equivalent If condition of the <b>Legacy Support</b> package.	Object Properties	Migrated to the <b>Object</b> condition of the <b>Recorder</b> package.	Application Running or Application Not Running	Migrated to the equivalent If condition of the <b>Application</b> package.	File Exists, File Does Not Exist, File Date, File Size	Migrated to the equivalent If condition of the <b>File</b> package.	Folder Exists or Folder Does Not Exist	Migrated to the equivalent If condition of the <b>Folder</b> package.	Ping Successful Or Ping Unsuccessful	Migrated to the equivalent If condition of the <b>Ping</b> package.	Service is running or Service is not running	Migrated to the equivalent If condition of the <b>Service</b> package.	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360																	
Web Control Exists or Web Control Does Not Exist	Migrated to the equivalent If condition of the <b>Legacy Support</b> package.																	
Object Properties	Migrated to the <b>Object</b> condition of the <b>Recorder</b> package.																	
Application Running or Application Not Running	Migrated to the equivalent If condition of the <b>Application</b> package.																	
File Exists, File Does Not Exist, File Date, File Size	Migrated to the equivalent If condition of the <b>File</b> package.																	
Folder Exists or Folder Does Not Exist	Migrated to the equivalent If condition of the <b>Folder</b> package.																	
Ping Successful Or Ping Unsuccessful	Migrated to the equivalent If condition of the <b>Ping</b> package.																	
Service is running or Service is not running	Migrated to the equivalent If condition of the <b>Service</b> package.																	
Loop (supporting commands)	<p>The following table shows the Loop commands supported for migration and their respective mappings in Automation 360.</p> <table border="1"> <thead> <tr> <th>10.x/11.x Command</th> <th>Automation 360 Actions</th> </tr> </thead> <tbody> <tr> <td>Exit Loop</td> <td>Break</td> </tr> <tr> <td>Continue</td> <td></td> </tr> </tbody> </table>	10.x/11.x Command	Automation 360 Actions	Exit Loop	Break	Continue		N/A – the migration process maps the fields automatically.										
10.x/11.x Command	Automation 360 Actions																	
Exit Loop	Break																	
Continue																		
Message Box	<p>This command is migrated to <b>Message box</b> action in Automation 360.</p> <p>See <a href="#">Message box package</a>.</p>	N/A – the migration process maps the fields automatically.																

Package	How it is migrated to Automation 360	What you need to do
Object Cloning	<p>This command is migrated to the <b>Recorder</b> package &gt; <b>Capture</b> action in Automation 360. Migration is supported for the following technologies:</p> <p>Migration is supported for applications using the following technologies (including when they are within a Citrix environment):</p> <ul style="list-style-type: none"> <li>• MSAA (Standard desktop technology)</li> <li>• Google Chrome browser</li> <li>• Internet Explorer browser</li> <li>• Java desktop</li> <li>• Web Java</li> <li>• UI Automation (advanced)</li> <li>• Firefox browser (object based on HTML technology only)</li> <li>• Microsoft Silverlight version 5</li> </ul> <p>The 10.x/11.x <b>GetAllChildrenName</b> and <b>GetAllChildrenValue</b> actions return string type variable values. In Automation 360, they return list values. The migration process joins the list values and stores them into a string variable to maintain consistent bot behaviors across releases.</p> <p>Object Cloning with the <b>Export to CSV</b> action in 10.x/11.x is migrated into the following packages/actions combinations because the action does not exist in Automation 360:</p> <ul style="list-style-type: none"> <li>• The <b>Capture</b> action saves the captured data into a table variable.</li> <li>• The <b>Write to file</b> action of the <b>Data table</b> package is then used to save the data from the table variable to the CSV file.</li> </ul> <p>If an action in the legacy Object Cloning command is disabled, the corresponding action in the migrated bot is also disabled.</p> <p>The window title is copied from the source command to the destination action.</p> <p>In 11.x, the command is used to capture the control in an image, whereas in Automation 360 the entire window image is captured with the control highlighted using a red rectangle.</p> <p>The X, Y coordinates and window title are also migrated to Automation 360.</p> <p>The <b>Coordinate</b> and <b>Image</b> execution or play modes from 11.x are migrated as the following actions because only object-based execution is supported in Automation 360.</p> <p><b>Play mode as coordinates:</b></p> <ul style="list-style-type: none"> <li>• <b>Mouse click actions:</b> The Click, Right Click, Left Click, Middle Click, and Double Click actions are migrated in the Mouse: Click action as a combination of Button and Events. The corresponding mouse buttons with events are migrated as shown: <ul style="list-style-type: none"> <li>• Click changes to Left Button-Click</li> <li>• Right Click changes to Right Button-Click</li> <li>• Middle Click changes to Left Button-Middle-Click</li> <li>• Double Click changes to Left Button Double-Click</li> </ul> </li> </ul>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do																
OCR	<p>All commands of <b>OCR</b> are migrated to equivalent Automation 360 actions of the <b>OCR</b> package. There is no change in behavior or command name.</p> <p>See <a href="#">OCR package</a>.</p>	N/A – the migration process maps the fields automatically.																
Open Program/File	<p>This command is migrated to the <b>Open program/file</b> action of the <b>Application</b> package.</p> <p>In 10.x/11.x, this command does not throw an error if you provide an incorrect value in the <b>Start In</b> field. Automation 360 validates the value entered for the same field and throws an error during bot execution.</p> <p>See <a href="#">Application package</a>.</p>	Users must change the bot accordingly if they want to continue even if the Start In value field is incorrect.																
PDF	<p>Migration is supported for the following PDF commands.</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Merge Document</td> <td>Merge document</td> </tr> <tr> <td>PDF to Image</td> <td>Extract image</td> </tr> <tr> <td>Extract Form Fields</td> <td>Extract field</td> </tr> <tr> <td>Extract Text</td> <td>Extract text</td> </tr> <tr> <td>Split Documents</td> <td>Split documents</td> </tr> <tr> <td>Encrypt Document</td> <td>Encrypt document</td> </tr> <tr> <td>Decrypt Document</td> <td>Decrypt document</td> </tr> </tbody> </table> <p>If the 11.x bot uses the <b>Extract Form Fields</b> command and stores values in the Credential Vault, the migration process migrates these values in the Automation 360 Credential Vault.</p> <p>See <a href="#">PDF package</a>.</p> <p>The output of a 11.x bot is mapped with multiple variables in the equivalent actions of the PDF package after that bot is migrated to Automation 360. This reduces the number of actions in the migrated bot because a separate action is no longer required to map output to a variable.</p>	10.x/11.x	Automation 360	Merge Document	Merge document	PDF to Image	Extract image	Extract Form Fields	Extract field	Extract Text	Extract text	Split Documents	Split documents	Encrypt Document	Encrypt document	Decrypt Document	Decrypt document	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360																	
Merge Document	Merge document																	
PDF to Image	Extract image																	
Extract Form Fields	Extract field																	
Extract Text	Extract text																	
Split Documents	Split documents																	
Encrypt Document	Encrypt document																	
Decrypt Document	Decrypt document																	
PGP	<p>All commands of <b>PGP</b> are migrated to equivalent Automation 360 actions of the <b>PGP</b> package. There is no change in behavior or command name.</p>	N/A – the migration process maps the fields automatically.																
Play Sound	<p>All commands of Play Sound are migrated to its equivalent actions of the <b>Sound</b> package in Automation 360.</p> <p>Automation 360 supports only .mp3 and .wav file types in Play media file action.</p> <p>See <a href="#">Play Sound package</a>.</p>	N/A – the migration process maps the fields automatically.																

Package	How it is migrated to Automation 360	What you need to do										
Printer	<p><b>Default Printer, Remove Printer, and Select Default Printer</b> are migrated to the equivalent actions of the <b>Printer</b> package in Automation 360.</p> <p>See <a href="#">Printer package</a>.</p>	N/A – the migration process maps the fields automatically.										
Prompt	<p>All commands of <b>Prompt</b> are migrated to equivalent Automation 360 actions of the <b>Prompt</b> package.</p> <p>The following table shows commands that can be migrated with name changes.</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Prompt For Value</td> <td>Converts to the <b>For value</b> action. In addition, <b>Simulate keystroke</b> action is added below the <b>For value</b> action to perform the keystrokes on the specific window title. This is to retain the execution behavior of old bots.</td> </tr> <tr> <td>Prompt for File</td> <td>For file</td> </tr> <tr> <td>Prompt for Folder</td> <td>For folder</td> </tr> <tr> <td>Prompt For Yes/No</td> <td>For yes/no</td> </tr> </tbody> </table> <p>See <a href="#">Prompt package</a>.</p>	10.x/11.x	Automation 360	Prompt For Value	Converts to the <b>For value</b> action. In addition, <b>Simulate keystroke</b> action is added below the <b>For value</b> action to perform the keystrokes on the specific window title. This is to retain the execution behavior of old bots.	Prompt for File	For file	Prompt for Folder	For folder	Prompt For Yes/No	For yes/no	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360											
Prompt For Value	Converts to the <b>For value</b> action. In addition, <b>Simulate keystroke</b> action is added below the <b>For value</b> action to perform the keystrokes on the specific window title. This is to retain the execution behavior of old bots.											
Prompt for File	For file											
Prompt for Folder	For folder											
Prompt For Yes/No	For yes/no											
Read from CSV/TXT	<p>The <b>Read from CSV/Text</b> is converted to <b>Open, Read, and Close</b> actions in the Automation 360 <b>CSV/TXT</b> package.</p> <p>If your 10.x/11.x bot is using a variable as a session name and the <b>Loop</b> action used to read all rows of the <b>CSV/TXT</b> is using a hard-coded session name instead of a variable, then you must review the migrated bot and set the output variable of the <b>CSV/TXT &gt; Read</b> action in the respective loop. Otherwise, you will get a UI error when you edit the Automation 360 bot.</p> <p>In Automation 360, if the CSV/TXT file is not present in the specified file path, the bot returns an error message, whereas in 11.x, the bot does not return such message.</p>	Review the migrated bot and set the output variable of the <b>CSV/TXT &gt; Read</b> action in the respective loop.										

Package	How it is migrated to Automation 360	What you need to do
REST Web Services	<p>The <b>Save Header To</b> option in 11.x is migrated to Automation 360. This option enables you to store the response header in the array and dictionary variables with the response header name as key and its header value as the value of the dictionary.</p> <p>In 11.x, the failure response is captured by default. In Automation 360, enabling the <b>Capture failure response</b> option captures the errors and adds to the response dictionary variable. When you migrate a 11.x bot to Automation 360, the <b>Capture failure response</b> option is enabled by default to capture the failure response of the migrated bot.</p> <p><i>REST Web Service package</i></p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do
Run Logic	<p><b>Run logic</b> command is migrated to the <b>Run</b> action of the <b>Task Bot</b> package in Automation 360.</p> <p>Additionally, <b>Error Handling</b> with the <b>Run Logic</b> command is migrated to the <b>Try and Catch</b> block.</p> <p>Bots that use the <b>Run Logic</b> command that passes Credential Vault attributes from a TaskBot to a MetaBot logic can be migrated to Automation 360. The credential name and attribute name are displayed in the fields in the corresponding line of the migrated bot.</p> <p>If you have migrated using the restored 11.x database, an equivalent locker is created in Automation 360 for the credential variables used in the 11.x bot.</p> <p>Choose one of the following options to run the migrated bots successfully:</p> <ul style="list-style-type: none"> <li>• <b>Option 1:</b> Pass the credential type variables. <ol style="list-style-type: none"> <li>1. Create a credential type variable in the child bots as input variables.</li> <li>2. In the <b>Run</b> action of the Task Bot package of the parent bot, update the input value fields to use the Credential Vault attributes for the credential type variable created for the child bot (corresponding to MetaBot logic).</li> </ol> </li> <li>• <b>Option 2:</b> Pass the credential values as a global value. <ol style="list-style-type: none"> <li>1. Create the Global value in Automation 360 for the credentials use in the <b>Run Logic</b> command in 11.x.</li> <li>2. In the <b>Run</b> action of the Task Bot package of the parent bot, update the Input value fields to use the Global values for the credential type variable created for the child bot (corresponding to MetaBot logic).</li> </ol> </li> </ul> <p>If you have not used the restored 11.x database when installing Automation 360, you must first create the required locker for the credential variables used in the 11.x bot, before performing the preceding steps.</p> <hr/> <p><b>Note:</b> Automation 360 provides enhanced security by allowing you to assign Credential Vault attributes only to the credential type variables. This restricts any nonsecure handling of Credential Vault attributes where they might have been assigned to non-credential type variables.</p> <hr/>	N/A – the migration process maps the fields automatically.
Run Script	The <b>Run Script</b> command is migrated to the <b>Run Script</b> action of the <b>Legacy automation</b> package.	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do																						
SAP > GUI Automation command	<p>This command is migrated to the Recorder package &gt; <b>Capture</b> action in Automation 360. All object properties in the 11.x bots are mapped with the equivalent properties in the migrated bots.</p> <p>The following table provides a list of SAP objects and the actions that can be migrated to Automation 360.</p> <table border="1"> <thead> <tr> <th>Object</th> <th>Action</th> </tr> </thead> <tbody> <tr> <td>Text box</td> <td>Set Text, Append Text, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Combo box</td> <td>Select Item By Text, Select Item By Index, Get Total Items, Get Selected Item Text, Get Selected Item Key, Get Property, Set Focus, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Check box</td> <td>Check, Uncheck, Toggle, Get Status, Get Property, Set Focus, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Button</td> <td>Click, Get Property, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Radio button</td> <td>Select, Get Status, Get Property, Set Focus, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Menu bar</td> <td>Select Item By Text, Get Property, Set Focus, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Tree</td> <td>Get Property, Set Focus, Left Click, Right Click, Double Click, Get total items, Get selected index, Get selected text, Select item by index, Select item by text</td> </tr> <tr> <td>Label</td> <td>Click, Get Property, Set Focus, Left Click, Right Click, Double Click</td> </tr> <tr> <td>Tab</td> <td>Get Property, Set Focus, Left Click, Right Click, Double Click, Get total items, Get selected index, Get selected text, Select item by index, Select item by text</td> </tr> <tr> <td>Rest of the control (It includes controls such as: GuiMainWindow,</td> <td>Get Property, Set Focus, Left Click, Right Click, Double Click</td> </tr> </tbody> </table>	Object	Action	Text box	Set Text, Append Text, Left Click, Right Click, Double Click	Combo box	Select Item By Text, Select Item By Index, Get Total Items, Get Selected Item Text, Get Selected Item Key, Get Property, Set Focus, Left Click, Right Click, Double Click	Check box	Check, Uncheck, Toggle, Get Status, Get Property, Set Focus, Left Click, Right Click, Double Click	Button	Click, Get Property, Left Click, Right Click, Double Click	Radio button	Select, Get Status, Get Property, Set Focus, Left Click, Right Click, Double Click	Menu bar	Select Item By Text, Get Property, Set Focus, Left Click, Right Click, Double Click	Tree	Get Property, Set Focus, Left Click, Right Click, Double Click, Get total items, Get selected index, Get selected text, Select item by index, Select item by text	Label	Click, Get Property, Set Focus, Left Click, Right Click, Double Click	Tab	Get Property, Set Focus, Left Click, Right Click, Double Click, Get total items, Get selected index, Get selected text, Select item by index, Select item by text	Rest of the control (It includes controls such as: GuiMainWindow,	Get Property, Set Focus, Left Click, Right Click, Double Click	N/A – the migration process maps the fields automatically.
Object	Action																							
Text box	Set Text, Append Text, Left Click, Right Click, Double Click																							
Combo box	Select Item By Text, Select Item By Index, Get Total Items, Get Selected Item Text, Get Selected Item Key, Get Property, Set Focus, Left Click, Right Click, Double Click																							
Check box	Check, Uncheck, Toggle, Get Status, Get Property, Set Focus, Left Click, Right Click, Double Click																							
Button	Click, Get Property, Left Click, Right Click, Double Click																							
Radio button	Select, Get Status, Get Property, Set Focus, Left Click, Right Click, Double Click																							
Menu bar	Select Item By Text, Get Property, Set Focus, Left Click, Right Click, Double Click																							
Tree	Get Property, Set Focus, Left Click, Right Click, Double Click, Get total items, Get selected index, Get selected text, Select item by index, Select item by text																							
Label	Click, Get Property, Set Focus, Left Click, Right Click, Double Click																							
Tab	Get Property, Set Focus, Left Click, Right Click, Double Click, Get total items, Get selected index, Get selected text, Select item by index, Select item by text																							
Rest of the control (It includes controls such as: GuiMainWindow,	Get Property, Set Focus, Left Click, Right Click, Double Click																							

Package	How it is migrated to Automation 360	What you need to do																
SAP	<p>SAP commands that support BAPI features in 11.x are migrated to equivalent actions of the SAP BAPI package in Automation 360.</p> <p>The following table shows the 11.x command and its equivalent action in Automation 360:</p> <table border="1"> <thead> <tr> <th>11.x command</th> <th>Automation 360 action</th> </tr> </thead> <tbody> <tr> <td>Connect</td> <td> <p><b>SAP BAPI &gt; Connect</b></p> <p>You must create the <b>JcoDllPath</b> and <b>JcoJarPath</b> global values. Update the <b>JcoJarPath</b> global value with the location of the SAP Java connector package and the <b>JcoDllPath</b> with the location of the SAP Java connector DLL.</p> </td> </tr> <tr> <td>Create Function</td> <td> <p><b>SAP BAPI &gt; Create function</b></p> </td> </tr> <tr> <td>Get Data command with the <b>Field</b> option selected</td> <td> <p><b>SAP BAPI &gt; Get field</b></p> </td> </tr> <tr> <td>Get Data command with the <b>Table</b> option selected</td> <td> <p><b>SAP BAPI &gt; Get table</b></p> </td> </tr> <tr> <td>Get Data command with the <b>Structure</b> option selected</td> <td> <p><b>SAP BAPI &gt; Get structure</b></p> </td> </tr> <tr> <td>Set Data command when the <b>Fields, Table, or Structure</b> option is selected</td> <td> <p><b>SAP BAPI &gt; Set field</b></p> </td> </tr> <tr> <td>Invoke Function</td> <td> <p><b>SAP BAPI &gt; Run function</b></p> </td> </tr> </tbody> </table>	11.x command	Automation 360 action	Connect	<p><b>SAP BAPI &gt; Connect</b></p> <p>You must create the <b>JcoDllPath</b> and <b>JcoJarPath</b> global values. Update the <b>JcoJarPath</b> global value with the location of the SAP Java connector package and the <b>JcoDllPath</b> with the location of the SAP Java connector DLL.</p>	Create Function	<p><b>SAP BAPI &gt; Create function</b></p>	Get Data command with the <b>Field</b> option selected	<p><b>SAP BAPI &gt; Get field</b></p>	Get Data command with the <b>Table</b> option selected	<p><b>SAP BAPI &gt; Get table</b></p>	Get Data command with the <b>Structure</b> option selected	<p><b>SAP BAPI &gt; Get structure</b></p>	Set Data command when the <b>Fields, Table, or Structure</b> option is selected	<p><b>SAP BAPI &gt; Set field</b></p>	Invoke Function	<p><b>SAP BAPI &gt; Run function</b></p>	N/A – the migration process maps the fields automatically.
11.x command	Automation 360 action																	
Connect	<p><b>SAP BAPI &gt; Connect</b></p> <p>You must create the <b>JcoDllPath</b> and <b>JcoJarPath</b> global values. Update the <b>JcoJarPath</b> global value with the location of the SAP Java connector package and the <b>JcoDllPath</b> with the location of the SAP Java connector DLL.</p>																	
Create Function	<p><b>SAP BAPI &gt; Create function</b></p>																	
Get Data command with the <b>Field</b> option selected	<p><b>SAP BAPI &gt; Get field</b></p>																	
Get Data command with the <b>Table</b> option selected	<p><b>SAP BAPI &gt; Get table</b></p>																	
Get Data command with the <b>Structure</b> option selected	<p><b>SAP BAPI &gt; Get structure</b></p>																	
Set Data command when the <b>Fields, Table, or Structure</b> option is selected	<p><b>SAP BAPI &gt; Set field</b></p>																	
Invoke Function	<p><b>SAP BAPI &gt; Run function</b></p>																	

Package	How it is migrated to Automation 360	What you need to do																					
Send Email	<p>In 10.x/11.x, the Send Email command uses user-specific email settings stored as credential attributes within the system locker. When the first bot is migrated, we create a custom locker called <b>AAE_Email</b> and add the <b>AAE_EmailSettings</b> credential with the Username and Password attributes to it. Additionally, we create Global Values for the non-credential attributes, such as Server host, port, SSL and authentication, which correspond to the same Email Settings. 10.x/11.x Email Settings credentials are split into Credential Variable and Global Values in Automation 360, so during the migration process, email settings are migrated as follows:</p> <table border="1"> <thead> <tr> <th>10.x/11.x Email Settings</th> <th>Automation 360 Email Settings</th> <th>Automation 360 Storage Type</th> </tr> </thead> <tbody> <tr> <td>Host</td> <td>AAE_EmailSettings_host</td> <td>Global Value of type String</td> </tr> <tr> <td>Port</td> <td>AAE_EmailSettings_port</td> <td>Global Value of type Number</td> </tr> <tr> <td>Use secure connection (SSL/TLS)</td> <td>AAE_EmailSettings_ssl</td> <td>Global Value of type Boolean</td> </tr> <tr> <td>My server requires authentication</td> <td>AAE_EmailSettings_auth</td> <td>Global Value of type Boolean</td> </tr> <tr> <td>Username</td> <td>userName</td> <td>Credential attribute within <b>AAE_EmailSettings</b> credential assigned to <b>AAE_Email</b> locker</td> </tr> <tr> <td>Password</td> <td>password</td> <td>Credential attribute within <b>AAE_EmailSettings</b> credential assigned to <b>AAE_Email</b> locker</td> </tr> </tbody> </table>	10.x/11.x Email Settings	Automation 360 Email Settings	Automation 360 Storage Type	Host	AAE_EmailSettings_host	Global Value of type String	Port	AAE_EmailSettings_port	Global Value of type Number	Use secure connection (SSL/TLS)	AAE_EmailSettings_ssl	Global Value of type Boolean	My server requires authentication	AAE_EmailSettings_auth	Global Value of type Boolean	Username	userName	Credential attribute within <b>AAE_EmailSettings</b> credential assigned to <b>AAE_Email</b> locker	Password	password	Credential attribute within <b>AAE_EmailSettings</b> credential assigned to <b>AAE_Email</b> locker	N/A – the migration process maps the fields automatically.
10.x/11.x Email Settings	Automation 360 Email Settings	Automation 360 Storage Type																					
Host	AAE_EmailSettings_host	Global Value of type String																					
Port	AAE_EmailSettings_port	Global Value of type Number																					
Use secure connection (SSL/TLS)	AAE_EmailSettings_ssl	Global Value of type Boolean																					
My server requires authentication	AAE_EmailSettings_auth	Global Value of type Boolean																					
Username	userName	Credential attribute within <b>AAE_EmailSettings</b> credential assigned to <b>AAE_Email</b> locker																					
Password	password	Credential attribute within <b>AAE_EmailSettings</b> credential assigned to <b>AAE_Email</b> locker																					
Services	All commands of <b>Services</b> are migrated to equivalent Automation 360 actions of the <b>Service</b> package. There is no change in behavior or command name.	N/A – the migration process maps the fields automatically.																					
SOAP Web Service	<p>This package behaves the same in Automation 360.</p> <p>If a SOAP web service is configured to call REST APIs, then we migrate them to the REST web service action instead of the SOAP web service action. Based on additional XML operations, we add actions from the <b>XML</b> package to make sure the migrated bot gives same result as the legacy bot.</p> <p>See <a href="#">SOAP Web Service package</a>.</p>	N/A – the migration process maps the fields automatically.																					

Package	How it is migrated to Automation 360	What you need to do																								
String Operation	<p>The 11.x or 10.x String Operation command is migrated to equivalent actions of the String package.</p> <p>The following table shows the String Operation commands and their equivalent actions in Automation 360.</p> <table border="1"> <thead> <tr> <th>11.x or 10.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>Before-After</td> <td>Extract</td> </tr> <tr> <td>Compare</td> <td>Compare</td> </tr> <tr> <td>Find</td> <td>Find</td> </tr> <tr> <td>Length</td> <td>Length</td> </tr> <tr> <td>Lower Case</td> <td>Lowercase</td> </tr> <tr> <td>Replace</td> <td>Replace</td> </tr> <tr> <td>Reverse</td> <td>Reverse</td> </tr> <tr> <td>Split</td> <td>Split</td> </tr> <tr> <td>Substring</td> <td>Substring</td> </tr> <tr> <td>Trim</td> <td>Trim</td> </tr> <tr> <td>Upper Case</td> <td>Uppercase</td> </tr> </tbody> </table> <p>11.x bots can use regular expressions in the <b>Find</b> and <b>Replace</b> commands to search for the string on which you want to perform an operation. The equivalent actions in Automation 360 too can use regular expressions to search for the string on which you want to perform an operation.</p> <p>In 11.x, the system considers the new line character (/n) used in the variable when you use the <b>Find</b> and <b>Replace</b> commands. However, in Automation 360, the system does not consider the new line character when you use the <b>Find</b> and <b>Replace</b> commands.</p>	11.x or 10.x	Automation 360	Before-After	Extract	Compare	Compare	Find	Find	Length	Length	Lower Case	Lowercase	Replace	Replace	Reverse	Reverse	Split	Split	Substring	Substring	Trim	Trim	Upper Case	Uppercase	N/A – the migration process maps the fields automatically.
11.x or 10.x	Automation 360																									
Before-After	Extract																									
Compare	Compare																									
Find	Find																									
Length	Length																									
Lower Case	Lowercase																									
Replace	Replace																									
Reverse	Reverse																									
Split	Split																									
Substring	Substring																									
Trim	Trim																									
Upper Case	Uppercase																									
System	<p><b>Lock computer, Logoff, Restart, and Shutdown</b> actions are migrated to the equivalent actions of the <b>System</b> package in Automation 360.</p> <p>See <a href="#">System package</a>.</p>	N/A – the migration process maps the fields automatically.																								

Package	How it is migrated to Automation 360	What you need to do								
Task	<p>The following table shows the different commands that are migrated to the respective actions of the Automation 360 <b>Task Bot</b> package.</p> <table border="1"> <thead> <tr> <th>10.x/11.x Command</th> <th>Automation 360 Action</th> </tr> </thead> <tbody> <tr> <td>Pause</td> <td>Pause</td> </tr> <tr> <td>Stop Task</td> <td>Stop</td> </tr> <tr> <td>Run Task</td> <td>Run. The output returned by the child bots is mapped to the respective variable in the parent bots.</td> </tr> </tbody> </table>	10.x/11.x Command	Automation 360 Action	Pause	Pause	Stop Task	Stop	Run Task	Run. The output returned by the child bots is mapped to the respective variable in the parent bots.	N/A – the migration process maps the fields automatically.
10.x/11.x Command	Automation 360 Action									
Pause	Pause									
Stop Task	Stop									
Run Task	Run. The output returned by the child bots is mapped to the respective variable in the parent bots.									

Package	How it is migrated to Automation 360	What you need to do
Terminal Emulator	<p>Encrypt text is not supported in the <b>Send Text</b> and <b>Set Field</b> actions for Automation 360. We recommend that you use Credential Vault instead of plain text.</p> <p>In 11.x and in Automation 360:</p> <ul style="list-style-type: none"> <li>• Bots that use the following terminal model can be migrated to Automation 360: <ul style="list-style-type: none"> <li>• VT 220 model of the VT Series terminal type</li> <li>• IBM 5555 B01 and C01 models of the TN 5250 terminal type</li> </ul> </li> <li>• A session (used to establish a connection with the terminal server) can be shared between the parent bot and a child bot. You can close a session from the child bot instead of closing the session from the parent bot.</li> <li>• You can use the <b>Default</b> terminal in bots for the VT100 terminal type.</li> <li>• Bots that send Japanese text using the <b>Send Text</b> command in 11.x with the <b>DBCS</b> option from the <b>Encoding</b> list and the <b>Japanese Shift-JIS (932)</b> option from the <b>CodePage</b> list selected in the <b>Connect</b> command can be migrated to Automation 360.</li> </ul> <p>Automation 360 does not support legacy technology and by default supports all capabilities of Advance Technology of the 10.x/11.x bots.</p> <p>The maximum index value in Automation 360 is 99999. The migration process automatically updates the value of <b>Field index</b> in the <b>Set Field</b> action to 99999 to meet the maximum value restriction. If the index value is higher than 99999 and is used in a variable, then you must change it manually.</p> <p>The SSHI feature is not yet supported in Automation 360.</p> <p>The <b>Search field</b> action enables you to search for field index or field name by using a text.</p> <p>Bots created in 11.x no longer shows the <code>Trying...</code> text after the bots are migrated to Automation 360.</p> <p>See <a href="#">Terminal Emulator package</a>.</p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do
Variable Operation (Assign)	<p><b>Value type variables</b></p> <p>The functionality for this command has been divided into multiple packages in Automation 360.</p> <p>In 10.x/11.x, this command was performing assignment operations for all the supported datatypes. Automation 360 has built a dedicated <b>Assign</b> action for each data type. The migration process handles the mapping of the corrected packages and action based on the assignment that the respective variable operation is performing.</p> <p>For 11.x bots that use the <b>Decimal configuration</b> option, the <b>To string</b> action of the Number package is added in the migrated bots. In 11.x, the system rounds off the value based on the value specified in the <b>Decimal configuration</b> field. For example, if the value that is assigned to the variable is 13.456 and the value specified in the <b>Decimal configuration</b> field is 2, the system rounds off the value in 11.x to 13.46. In Automation 360, the value is trimmed instead of rounded off. For example, the value 13.456 will be converted to 13.45 in Automation 360.</p> <p><b>List type variables</b></p> <p>Operations involving on list assignments are migrated to the <b>Set item</b> of the <b>List</b> package. If the operation has a fixed value, the system creates a temporary variable and stores the fixed value in it. You can then use this temporary variable in the <b>Assign</b> action of the <b>List</b> package to save it.</p> <p><b>Array type variables</b></p> <p>Operations involving on array assignment is migrated to <b>Set value of a single cell</b> action of the <b>Datatable</b> package to set a value for specific rows and columns.</p> <p><b>Dictionary type variables</b></p> <p>Operations involving dictionary assignment is migrated to the <b>Put</b> action of the <b>Dictionary</b> package to set the value for a specific key. If the key is a combination of a variable and fix value (for example <code>\$Dictionary(key-\$id\$)</code>), then the <b>String</b> package &gt; <b>Assign</b> action is added to get the actual key.</p> <p><b>System variable \$Date\$</b></p> <p>The 10.x/11.x Variable Operation command that uses the <b>\$Date\$</b> system variable is migrated to Automation 360 by adding new date actions based on the operation being performed using <b>\$Date\$</b>. The migration process also converts the date value to a default string format – <code>mm/dd/yyyy HH:mm:ss</code>.</p> <p><b>Random variable of sub type string</b></p> <p>We migrate and map directly.</p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do
Variable Operation (Reinitialize)	<p><b>List variable</b></p> <p>For the <b>Variable Operations</b> command that reinitialize the list variable in 10.x/11.x, the migration process creates a temporary list variable with new values and assign it to the destination list variable in Automation 360.</p> <p><b>List variable declared by reading a Text file</b></p> <p>This command is migrated to the <b>Import list from text file</b> action in the <b>Legacy Automation</b> package.</p> <hr/> <p><b>Note:</b> In Automation 360, the bot encounters an error if the source file is empty or does not contain a key for initializing the list variable, unlike in 10.x or 11.x.</p> <hr/> <p><b>Array variable declared by reading a Text file</b></p> <p>The Array variable type is migrated as a Table variable type in Automation 360. The system uses the <b>CSV/TXT</b> package to read and load the respective data into the table variable in the bot.</p> <p><b>Dictionary variable</b></p> <p>The migration process creates a temporary dictionary variable to store all keys and values. Then the system uses the <b>Dictionary</b> package &gt; <b>Assign</b> action to update the target variable with the keys and values from the temporary dictionary variable.</p> <p><b>Dictionary variable declared by reading a Text file</b></p> <p>The migration process addresses this use case by adding actions to read the CSV file using the <b>CSV/Text</b> package and storing the data in a table variable. Then it adds actions to perform a loop on the table variable and uses the <b>Dictionary</b> package &gt; <b>Put</b> action to add keys and values into the dictionary variable.</p> <p><b>Array variable declared by reading an Excel/CSV file</b></p> <p>The migration process addresses this use case by migrating the Array variable type as a Table variable type in Automation 360. The system adds <b>Open, Get Multiple Cells,</b> and <b>Close</b> actions of the <b>Excel Advance</b> package and populates the table variable.</p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do
Variable Operation (resetting system variables)	<p>The following system variables are migrated as user defined variables in Automation 360. The system adds a respective action to clear the value of the equivalent variable created in Automation 360.</p> <ul style="list-style-type: none"> <li>• Email Cc</li> <li>• Email From</li> <li>• Email Message</li> <li>• Email Received Date</li> <li>• Email Received Time</li> <li>• Email Subject</li> <li>• Email To</li> <li>• Error Description</li> <li>• Error Line Number</li> </ul>	N/A – the migration process maps the fields automatically.
Wait	<p><b>Wait for window</b> and <b>Wait for screen change</b> in Automation 360 throws an exception error if the respective window is not open/close in the specified time or the screen is not found in specified time. In these cases, the system adds try and catch block if the command was configured to stop the bot and adds the <b>Stop task</b> action in the catch block. This is to ensure that the execution behaviour of migrated bots is the same as 10.x/11.x.</p> <p>Because we are migrating commands with the <b>Stop bot</b> action is encapsulated with the try and catch block in Automation 360, the bot also stops if the action fails due to some other reason. During the migration process, the <b>Stop bot</b> action also adds extra error handlers in the migrated bots when the <b>Stop the task</b> option is selected.</p> <p>The <b>Wait for window</b> action can have negative values for coordinates that are not supported in Automation 360. The negative values are changed to 0 during the migration process.</p>	N/A – the migration process maps the fields automatically.
Web Recorder	<p>All commands (except those mentioned below explicitly) of <b>Web recorder</b> are migrated to respective actions within the <b>Legacy Automation</b> package in Automation 360. The <b>Legacy Automation</b> package ensures that the migrated bots give the same results as 10.x/11.x. However, it is not recommended to use the <b>Legacy Automation</b> package for new development.</p> <p><b>Find broken links</b> is migrated to <b>Browser &gt; Find broken links</b> package. Additionally, 10.x/11.x has the "Find broken links timeout" and "Find broken links" options within the Tools &gt; Options. Automation 360 has these options as part of the action and the timeout defaults to 10 seconds and the number of parallel threads value defaults to 10.</p> <p><b>Download files</b> is migrated to <b>Browser &gt; Download files</b> package.</p> <p>During the migration process, the <b>Extract table</b> action adds extra error handlers in the migrated bots when the <b>On error continue with next action</b> check box is enabled.</p>	N/A – the migration process maps the fields automatically.

Package	How it is migrated to Automation 360	What you need to do														
Window Action	<p>All commands of Windows Actions are migrated to its equivalent actions of the Window package in Automation 360.</p> <p>11.x bots can use regular expressions in the <b>Get Active Window Title, Activate Window, Maximize Window, Minimize Window, Close Window, and Resize Window</b> commands to search for the window on which you want to perform an operation. The equivalent actions in Automation 360 too can use regular expressions to search for the window on which you want to perform an operation.</p> <p>See <a href="#">Window package</a>.</p>	N/A – the migration process maps the fields automatically.														
XML	<p>All commands of XML are migrated to its equivalent actions of the <b>XML</b> package in Automation 360.</p> <p>The following command name have changed.</p> <table border="1"> <thead> <tr> <th>10.x/11.x</th> <th>Automation 360</th> </tr> </thead> <tbody> <tr> <td>End XML session</td> <td>End session</td> </tr> <tr> <td>Start XML session</td> <td>Start session</td> </tr> <tr> <td>Delete Node/Attribute</td> <td>Delete node</td> </tr> <tr> <td>Update Node/Attribute</td> <td>Update node</td> </tr> <tr> <td>Get nodes action with the "Single Nodes" option selected</td> <td>Get single node action</td> </tr> <tr> <td>Get nodes action with the "Multiple Nodes" option selected</td> <td>Get multiple node action</td> </tr> </tbody> </table> <p>11.x bots that extract nodes that contain namespace from an XML file can be migrated to Automation 360. If you add a namespace to a node in an XML file, you must save and reload the XML file to reflect the changes.</p> <p>See <a href="#">XML package</a> .</p>	10.x/11.x	Automation 360	End XML session	End session	Start XML session	Start session	Delete Node/Attribute	Delete node	Update Node/Attribute	Update node	Get nodes action with the "Single Nodes" option selected	Get single node action	Get nodes action with the "Multiple Nodes" option selected	Get multiple node action	N/A – the migration process maps the fields automatically.
10.x/11.x	Automation 360															
End XML session	End session															
Start XML session	Start session															
Delete Node/Attribute	Delete node															
Update Node/Attribute	Update node															
Get nodes action with the "Single Nodes" option selected	Get single node action															
Get nodes action with the "Multiple Nodes" option selected	Get multiple node action															

## Variable mapping for migration

Some variables map directly from previous product versions to Automation 360 while others behave differently or contain configuration changes.

- [User defined variables](#)
- [System variables](#)
- [Credential variables](#)

### User defined variables

In Automation 360, all variables defined in bots are created as "Use as input" and "Use as output" types during migration to exchange values between parent bots and child bots.

The following table provides information about the user defined variable types and how they are migrated to Automation 360.

Legacy Variable Type	How it is migrated to Automation 360	What you need to do
Array	<p><b>Sub-type value</b></p> <p>These variables are migrated to <b>Table</b> with all column values as <b>String</b>.</p> <p><b>Sub-type "Read from text file"</b></p> <p>These variables are migrated to <b>Table</b> with all column values as <b>String</b>. The following actions are added as part the of migration process to configure data in the variable:</p> <ul style="list-style-type: none"> <li>• <b>Open</b> action from the <b>CSV/TXT</b> package, which opens the file for reading</li> <li>• <b>Read</b> action from the <b>CSV/TXT</b> package, which returns the value in the Table variable</li> <li>• <b>Close</b> action from the <b>CSV/TXT</b> package, which closes the file</li> </ul> <p><b>Sub-type "Read from database"</b></p> <p>Variables with this sub-type are migrated to the <b>Table</b> package with all column values as <b>String</b>. The following actions are added as part the migration process to fill in the variable:</p> <ul style="list-style-type: none"> <li>• Add the <b>Connect</b> action of the <b>Database</b> package with the respective connection string.</li> <li>• Add the <b>Export to datatable</b> action of the <b>Database</b> package to return the results to the datatable variable.</li> <li>• Add the <b>Disconnect</b> action of the <b>Database</b> package to disconnect the database.</li> </ul> <p><b>Sub-type "Read from Excel/CSV file"</b></p> <p>These variables are migrated to <b>Table</b> with all column values as <b>String</b>. The following actions are added as part the of migration process to configure data in the variable:</p> <ul style="list-style-type: none"> <li>• <b>Open</b> action from the <b>Advance Excel</b> package, which opens the file for reading</li> <li>• <b>Get multiple cells</b> action from the <b>Advance Excel</b> package, which returns the <b>Table</b> variable value if <b>All Cells</b> or <b>Range</b> option is chosen in the variable declaration</li> <li>• <b>Read now</b> action from the <b>Advance Excel</b> package, which returns the <b>Table</b> variable value if the <b>Entire Row</b> option is chosen in the variable declaration</li> <li>• <b>Read column</b> action from the <b>Advance Excel</b> package, which returns the <b>Table</b> variable if the <b>Entire Column</b> option is chosen in the variable declaration.</li> </ul> <p>Additionally, the <b>Assign list to datatable of list</b> package is used to store the returned valued to the variable.</p>	<p>In Automation 360, an empty table variable returns a run time error. If your migrated bot contains an empty table variable, you must fix it in the Automation 360 environment.</p>

Legacy Variable Type	How it is migrated to Automation 360	What you need to do
Dictionary	<p><b>Sub-type Value</b></p> <p>The system migrates these variables to the <b>Dictionary</b> type with the <b>String</b> sub-type in Automation 360.</p> <p><b>Sub-type "Read from CSV file"</b></p> <p>The migration process adds actions to read the CSV file using the <b>CSV/Text</b> package and stores the data in a table variable. It also adds actions to perform a loop on the <b>Table</b> variable and uses the <b>Put</b> action of the <b>Dictionary</b> package to add the key and values in the <b>Dictionary</b> variable.</p> <p>Dictionary keys are not case sensitive in 10.x/11.x, but they are in Automation 360. To maintain the bot execution resilience, the migration process converts all dictionary keys to lower case values. We use string express <b>Lower case</b> if a variable is used as a dictionary key to get the lower case key name.</p> <p>When the system passes a dictionary variable from an 11.x bot to a DLL function of a different type, the DLL function accepts the following as input types: UInt16, Int16, Int32, Int64, Int, Char, Single, Decimal, Float, Double, Boolean, bool, Byte, String, and Datetime.</p> <p>In 11.x, the bot does not encounters an error if the proper path of CSV file does not exist in the dictionary variable for the Read from CSV file command. In , Automation 360 the migrated bots encounter an error if proper path of CSV file does not exist in the dictionary variable. Ensure to provide the proper path of CSV file in the dictionary variable before you execute the bot.</p>	No action required from users

Legacy Variable Type	How it is migrated to Automation 360	What you need to do
List	<p><b>Sub-type Value</b></p> <p>These variables are migrated to <b>List</b> with sub-type <b>String</b>.</p> <p><b>Sub-type Array</b></p> <p>These variables are migrated to <b>List</b> with sub-type <b>String</b>.</p> <p><b>Sub-type Reading from text file</b></p> <p>Where a variable that is declared by reading a file is called, the <b>Import list from text file</b> action of the <b>Legacy automation</b> package is added above the action being migrated.</p> <p><b>Declared as "Make Random"</b></p> <p>The <b>List</b> variable can be declared as "Make Random" in 10.x/11.x to return a random item from the list. The migration process adds the new <b>Size</b> action to the <b>List</b> package to get the list size and adds the <b>Assign a random number</b> action to the <b>Number</b> package to find the random position and use it to get a random list item.</p> <p><b>Additional comments</b></p> <ul style="list-style-type: none"> <li>In 10.x/11.x, <b>List</b> is accessible without specifying any index. In A2019, you must specify the respective index to fetch the specific value from the list. For example, here is how <b>List</b> variables can be accessed by index: <pre>\$listVariable[0]\$</pre> <p>where 0 represents the first value in the list.</p> </li> <li>Index position starts from with 1 in 10.x/11.x, whereas it starts with 0 in Automation 360.</li> <li>In 11.x, when a list with a fixed index is used, the system returns the value available in the first index of the list. For example, consider that you have a list with values 1, 2, 3, and 4, and you use <code>\$IntList(3)\$</code> to retrieve the value in the third index position of the list. The system returns the value available in the first index position of the list (1) instead of the specified index position (3).</li> </ul> <p>In Automation 360, the system return the value available in the specified index position (for the above example, it returns 3). 11.x bots that use such expressions with fixed indexes in the list and are migrated to Automation 360 return the value available in the specified index position.</p> <ul style="list-style-type: none"> <li>If a list has 10 items and a loop is running for more than 10 times, then 10.x/11.x returns the first value of the list after the 10th iteration.</li> </ul> <p>When the system passes a List variable from an 11.x bot to a DLL function of a different type, the</p>	<p>In Automation 360, an empty list variable used outside a loop returns a run time error. If your migrated bot meets this criteria, you must fix it in the Automation 360 environment.</p>

Legacy Variable Type	How it is migrated to Automation 360	What you need to do
Random	<p>When there is a Random variable of the sub-type String, the migration process adds the <b>Generate random string</b> action of the <b>String</b> package to generate a random string above the <b>If</b> condition and assigns the value to the respective migrated variable in Automation 360.</p> <p>When there is a Random variable of the sub-type Number, the migration process adds the <b>Assign a random number</b> action of the <b>Number</b> package to generate a random string above the <b>If</b> condition and assigns the value to the respective migrated variable in Automation 360.</p>	No action required by users
Value	<p>Bots that use value type variables within a variable can be migrated to Automation 360. In 11.x bots that use a variable within a variable in the Insert Keystrokes command, the <b>Evaluate value</b> action of the String package is added in the migrated bot. <b>Sub-type Value</b></p> <p>These variables always migrates as <b>String</b> in Automation 360, even if it has number, boolean, or datetime values in it. Expression are used in Automation 360 to convert a string to other types if required.</p> <p><b>Sub-type Read from text file</b></p> <p>To maintain the bot execution integrity during migration, where a variable that is declared by reading a file is called, the <b>Import string from text file</b> action of the <b>String</b> package is added just above the action being migrated.</p> <p><i>String package</i></p> <p><i>Number package</i></p> <p><i>Boolean package</i></p> <p><i>Datetime package</i></p>	No action required by users

## System variables

In some use cases, system variables such as Error Line Number, Error Description, OS Name, and others return a different value in Automation 360. Bots using these variables in a decision making or string operation require a review post migration.

Some system variables used inside a loop are now user defined variable in the loop. In some instances, the user defined variable might require configuration in the migrated bot.

Some system variables become actions in Automation 360. Those actions are added just above the action that is using these variables.

If a variable is defined at the index position for the following system variables, you might need to fix the migrated bots because the migration process could not determine if the variable contains an index

or column name. If you do not fix it, the bot might return a "Key not found in record" runtime error. The migration process treats the value of a variable as name, but if it is an index, you must change it accordingly.

- \$Filedata Column\$
- \$Dataset Column\$
- \$XML Data Node\$
- \$Excel Column\$

Following table provides information about the various system variables and how they are migrated to Automation 360. Some variables are now part of actions, some have become actions, and some are still known as system variables but has syntax changes.

System Variable	How it is migrated to Automation 360	What you need to do
\$Day\$	Becomes \$System:Day\$ in Automation 360	No action required by user
\$Month\$	Becomes \$System:Month\$ in Automation 360	No action required by user
\$Year\$	Becomes \$System:Year\$ in Automation 360	No action required by user
\$Date\$	Becomes \$System:Date\$ in Automation 360 The date format set for the variable in the 11.x or 10.x bot is stored in the <b>AADefaultDateFormat</b> global value.	No action required by user
\$Hour\$	Becomes \$System:Hour\$ in Automation 360	No action required by user
\$Minute\$	Becomes \$System:Minute\$ in Automation 360	No action required by user
\$Clipboard\$	Becomes \$System:Clipboard\$ in Automation 360	No action required by user
\$Machine\$	Becomes \$System:Machine\$ in Automation 360	No action required by user
\$MiliSecond\$	Becomes \$System:MiliSecond\$ in Automation 360	No action required by user
\$Dataset Column\$	This system variable is now part of the <b>For each row in a SQL query dataset</b> iterator in <b>Loop</b> . The system creates a new variable in the loop and uses it inside the loop wherever \$Dataset Column\$ is present.	No action required by user
\$Extension\$ and \$FileName\$	These system variables were used in the <b>For each file in a folder</b> iterator of <b>Loop</b> . However, in Automation 360, a dictionary type variable is used to capture the extension and file name, which can be retrieved with "extension" and "name" key name respectively.  <i>Loop package.</i>	No action required by user

System Variable	How it is migrated to Automation 360	What you need to do
\$Email\$ \$Email From\$ \$Email Message\$ \$Email Received Date\$ \$Email Received Time\$ \$Email Subject\$ \$Email To\$	These system variables were used inside the <b>For each mail in mail box</b> iterator of <b>Loop</b> . In Automation 360, a dictionary type variable is used to capture all email values that can be retrieve with the respective keys.  <i>Using dictionary variable for email properties</i>	No action required by user
\$FolderName\$	This system variable is used inside the <b>For each folder in a folder</b> iterator of <b>Loop</b> . In Automation 360, the value is returned to the string variable specified in the loop.	No action required by user
\$XML Data Node\$	This system variable is used inside the <b>For each node in XML dataset</b> iterator of <b>Loop</b> . In Automation 360, the value is returned to the string variable specified in the loop.	No action required by user
\$Counter\$	This system variable is deprecated in Automation 360. The migration process creates a user-defined variable type <b>Number</b> and modifies the bot to ensure it provides the same output as the 11.x bot.  If you have used the \$Counter\$ variable in a loop, the migration process replaces the variable with the \$Condition-Counter\$ variable in the migrated bot and sets its value to 1.	No action required by user
\$ArrayColumns(\$arrayVariable\$)\$	Becomes an expression in Automation 360: <code>\$arrayVariable.DataTable:columnCount\$</code>	No action required by user
\$ArrayRows(\$arrayVariable\$)\$	Becomes an expression in Automation 360: <code>\$arrayVariable.DataTable:rowCount\$</code>	No action required by user
\$AAControlRoom\$	Becomes <code>\$System:AAControlRoom\$</code> in Automation 360	No action required by user
\$RAMUsage\$	Becomes <code>\$System:RAMUsage\$</code> in Automation 360	No action required by user
\$TotalRAM\$	Becomes <code>\$System:TotalRAM\$</code> in Automation 360	No action required by user
\$OSName\$	10.x/11.x returns the <b>Microsoft Windows 10 Pro 64-bit</b> value. In Automation 360, this variable becomes <code>\$System:OSName\$</code> and returns the <b>Windows 10 64-bit</b> .	No action required by user
\$CPUUsage\$	Becomes <code>\$System:CPUUsage\$</code> in Automation 360	No action required by user
\$Excel Cell Row\$	This system variable is migrated to the <b>Get row number</b> action of the <b>Excel</b> package in Automation 360 and added just above the action in which it is used.	No action required by user

System Variable	How it is migrated to Automation 360	What you need to do
\$Excel Cell Column\$	<p>This system variable is migrated to the <b>Get column name</b> action of the <b>Excel</b> package in Automation 360 and added just above the action in which it is used.</p> <p>10.x/11.x returns the first column (for example column A) for the \$Excel Cell Column\$ even if the active cell is not column A (for example column F10) inside a loop. In Automation 360, the same configuration returns the active cell (for example column F10). Below are the use cases that result in the above behavior change:</p> <ul style="list-style-type: none"> <li>• Excel is opened with or without "contains header" checked containing 10 rows.</li> <li>• Set active cell as F10</li> <li>• A loop is performed to row read</li> <li>• Put a <b>Message Box</b> with \$Excel Cell Column\$ in it</li> <li>• Run the bot</li> </ul>	Considering the behavior differences, you might need to change some bots.
\$Excel Cell\$	This system variable is migrated to the <b>Get cell address</b> action of the <b>Excel</b> package in Automation 360 and added just above the action in which it is used.	No action required by user
\$AATaskExecutor\$	<p>This system variable becomes <b>\$AATaskExecutor\$</b> and <b>\$AATaskInvoker\$</b> in Automation 360.</p> <p>In 11.x, this variables return various values about the task invoker and executor (for example, the invoker's and executor's first name, last name, email address, and username). In Automation 360, the <b>\$AATaskInvoker\$</b> variable returns the following values:</p> <ul style="list-style-type: none"> <li>• Invoker_Username</li> <li>• Invoker_Firstname</li> <li>• Invoker_Lastname</li> <li>• Invoker_Email</li> </ul> <p>The <b>\$AATaskExecutor\$</b> variable returns the following values:</p> <ul style="list-style-type: none"> <li>• Executor_Username</li> <li>• Executor_Firstname</li> <li>• Executor_Lastname</li> <li>• Executor_Email</li> <li>• Executor_Type</li> </ul>	No action required by user
\$AATaskName\$	<p>This system variable becomes <b>\$System.AATaskName\$</b> in Automation 360.</p> <p>In 10.x/11.x, this variable returns the value to your computer path directory (for example Automation Anywhere\My Tasks\My Folder\My Folder2\AATaskName.atmx). In Automation 360, it returns the value to the bot path relative to the Control Room (for example Bots/AATaskName).</p>	Considering the values returned are different between the versions, you might need to change some bots.

System Variable	How it is migrated to Automation 360	What you need to do
\$AAApplicationPath\$	<p><b>11.x specific:</b> This 11.x system variable returns the path set by users in the <b>Tool &gt; Option</b> setting of what is known as the "client application". In Automation 360, it becomes a global value. The migration process maps this change automatically and the value set of each user in 11.x is copied to the global value variable <b>@AAApplicationPath</b>.</p> <p><b>10.x specific:</b> This 10.x system variable does not automatically migrate to Automation 360 as a global value. Post migration, you must create the <b>AAApplicationPath</b> global value in Automation 360 and update it with the 10.x path. This update ensures that when you run the bot in Automation 360, the <b>AAApplicationPath</b> folder value is uniquely resolved for each user. For example, if the 10.x path value for <b>AAApplicationPath</b> is <i>D:\John.Doe\My Documents\Automation Anywhere Files</i>, then you must create the <b>AAApplicationPath</b> global value in Automation 360 and update with this path.</p> <p>See <a href="#">Global values</a>.</p>	<p>No action required by user for 11.x because the system variable is automatically mapped as a global value during migration if you have used the restored 11.x database when installing Automation 360.</p> <p>10.x users must create the <b>AAApplicationPath</b> global value in Automation 360 after migration.</p> <p>Ensure that the <b>CAN be changed</b> option is selected when creating the <b>AAApplicationPath</b> global value. Bot Creators and Bot Runners must set the value for the <b>AAApplicationPath</b> global value before they run the migrated bots.</p>
\$AAInstallationPath\$	<p>This system variable becomes <b>\$System:AAInstallationPath\$</b> in Automation 360.</p> <p>In 10.x/11.x, it returns the Enterprise client installation path (for example <i>C:\Program Files (x86)\Automation Anywhere\Enterprise\Client</i>). In Automation 360, it returns the Bot agent installation path (for example <i>C:\Program Files\Automation Anywhere\Bot Agent</i>).</p>	<p>Considering the values returned are different between the versions, you might need to change some bots.</p>

System Variable	How it is migrated to Automation 360	What you need to do
\$Date\$	<p>This system variable becomes <b>\$System:Date\$</b> in Automation 360.</p> <p>In 10.x/11.x, this variable returns the current date and time in a format specified in the <code>AA.Settings.XML</code> file. In Automation 360, <b>\$System:Date\$</b> returns values of type <b>Datetime</b> and users must use an action to change it in to String. To minimize disruption to users, the migration process does the following to each \$Date\$ instance:</p> <ul style="list-style-type: none"> <li>• Creates a temp variable <b>\$SystemDateInString\$</b> of type String.</li> <li>• Adds a <b>ToString</b> action of <b>Datetime</b> package to convert <b>\$System:Date\$</b> to string with customer format as "MM/dd/yyyy HH:mm:ss" and store the output into above string variable.</li> <li>• Uses this string variable where ever <b>\$Date\$</b> is used.</li> <li>• The above steps are repeated for each occurrence of <b>\$Date\$</b>.</li> </ul> <p>Depending on how your bot is configured, you might need to update the date/time configuration.</p>	Change the bot if the date format is not "MM/dd/yyyy HH:mm:ss"
\$Current Directory\$	This system variable is deprecated in Automation 360 and automatically converted to a user defined variable during migration. Its value is set per the value defined in <b>Loop &gt; For each file in a folder</b> and <b>For each folder in a folder</b> .	No action required by user
\$Error Line Number\$ \$Error Description\$	In 10.x/11.x, these system variables are used after the <b>Error Handling</b> command. In Automation 360, the value is returned to the user defined variables specified in the <b>Catch</b> action.	No action required by user
\$PDFFileName\$ \$PDFTitle\$ \$PDFAuthor\$ \$PDFSubject\$	<p>In 10.x or 11.x, these system variables were used after any <b>PDF</b> command. In Automation 360, a Dictionary type variable is used to capture all PDF values that can be retrieve with the respective keys. Every PDF action returns this Dictionary variable with corresponding PDF values.</p> <p><i>Using a dictionary variable for PDF properties</i></p>	No action required by user
\$System\$	<p>In 11.x or 10.x, this system variable is used to retrieve information about a device's settings and its performance. In Automation 360, the <b>Get environment variable</b> action of the System package is used.</p> <p><i>Environment variables for System package</i></p>	

System Variable	How it is migrated to Automation 360	What you need to do
\$WorkItem\$	<p><b>\$WorkItem\$ is String</b> Migrated as is.</p> <p><b>\$WorkItem\$ is Number</b></p> <ul style="list-style-type: none"> <li>• If it is displaying or logging a Number, the number is changed to a String</li> <li>• If it is displaying as a Number, migrate as a Number type</li> </ul> <p><b>\$WorkItem\$ is DateTime</b> Migrate as is, but the migrated package results in an error, so you cannot migrate the package.</p>	For the DateTime type, you cannot migrate the package yet, so the associated bot must be migrated at another time
\$Trigger Value\$	<p>Becomes \$TriggerValue\$ in Automation 360. For 11.x bots that use this variable, perform the following tasks to run the migrated bots successfully:</p> <ul style="list-style-type: none"> <li>• Create the equivalent triggers in Automation 360 for all the triggers that were used in 11.x bots.</li> </ul> <p>The output of triggers in Automation 360 is stored in a record type variable.</p> <ul style="list-style-type: none"> <li>• Update the migrated bots to use the appropriate actions to assign the values from the record variable that contains output from triggers to the \$TriggerValue\$ variable.</li> </ul> <p>For example, if you want to assign a host and port key from the record variable of an email trigger to the \$TriggerValue\$ variable, use the \$EmailTriggerData(host)\$EmailTriggerData(port)\$ expression. Similarly, to retrieve location of a file use \$FileTriggerData(file)\$ expression and to retrieve location of a folder use \$FolderTriggerData(fromFolder)\$ expressions.</p>	

## Credential variables

The credential variables used for the **Username** and **Password** fields in 10.x and 11.x are migrated as **Credential variables** in Automation 360.

The method of migration differs for 10.x and 11.x.

To learn how 10.x credentials are migrated, see the section on credentials in [How 10.x data is copied to Automation 360](#).

The following describes how 11.x credentials are migrated to Automation 360.

The credential variables used in fields other than the **Username** and **Password** fields are migrated as **Global Values**. These fields include hostname, port number, and so on. The migrated global values have the following syntax: <credentialname>\_<attributename>. For example in 11.x, a credential FTPConnection with an attribute hostname is migrated as FTPConnection\_hostname.

The following table provides information about the packages and actions that support the migration of credential variables from 11.x to Automation 360:

Package	Actions
Active Directory	<ul style="list-style-type: none"> <li>• Create and Modify User</li> <li>• Create and Modify Group</li> <li>• Create and Modify Object</li> <li>• Search</li> <li>• Get Property</li> </ul>
Database	<ul style="list-style-type: none"> <li>• Connect with connection string</li> <li>• Username</li> <li>• Password</li> </ul>
Email Automation	<ul style="list-style-type: none"> <li>• Hostname</li> <li>• Username</li> <li>• Password</li> </ul>
Excel	Open Spreadsheet
FTP / SFTP	Connect
Insert Keystrokes	All keystrokes that require use of credentials
Legacy Automation	Set Text in Manage Web Controls action
Manage Window Controls	<ul style="list-style-type: none"> <li>• Set Text</li> <li>• Append Text</li> </ul>
PDF	<ul style="list-style-type: none"> <li>• PDF to Image</li> <li>• Extract Form Fields</li> <li>• Extract Text</li> <li>• Split, Encrypt, and Decrypt Document</li> </ul>
PGP	<ul style="list-style-type: none"> <li>• Encrypt and Decrypt Files</li> <li>• Create Keys</li> </ul>
Recorder	<ul style="list-style-type: none"> <li>• Set Text</li> <li>• Append Text</li> </ul> <hr/> <p><b>Note:</b> Migrated from Object Cloning command as Capture action.</p> <hr/>

Package	Actions
REST Web Service	<ul style="list-style-type: none"> <li>• URI</li> <li>• Username</li> <li>• Password</li> <li>• Headers</li> <li>• Operation parameters</li> </ul> <hr/> <p><b>Note:</b> Domain name is migrated as a global value.</p> <hr/>
SOAP Web Service	<ul style="list-style-type: none"> <li>• Username</li> <li>• Password</li> <li>• Headers</li> <li>• Operation parameters</li> <li>• Raw data parameters</li> </ul>
Terminal Emulator	<ul style="list-style-type: none"> <li>• Connect command for SSH2 with User and Key file authentication options</li> <li>• Send Text</li> <li>• Set Field</li> </ul>
Web Recorder	Manage Web Controls with Set Text and Append Text functions

## Verify the bot migration

It is important that you verify that the migration is complete and the migrated bot runs successfully in the Automation 360 environment. The bot might have been converted, but it might contain errors that prevent it from running successfully.

1. Log in to your Automation 360 environment from a machine with the Bot agent installed using a Bot Creator account and the "View Migration" permission.
2. Verify that the migration completed successfully by clicking **Administration > Migration**.
3. Confirm that your migration instance has the "successful" status (indicated by the green check mark) and the **Migrated Item** column shows "1" to indicate that 1 bot was migrated. If the **Migrated Item** column shows "0", your bot has not migrated successfully and will not be available on the **My Bots** page.
4. Verify that the bot runs successfully by clicking **Activity > In progress**.
5. Navigate to the migrated bot.  
For example, if you migrated a bot from the `My Tasks` folder, then navigate to the same folder to find your migrated bot.
6. Click the bot and fix any errors.
7. Run the bot to confirm that all errors have been fixed.

### Related concepts

[Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

## View migration reports

Use the reports to analyze the status of individual bot migration, data migration, and audit log migration and identify the status and summary of the individual migration.

You must have the **View migration** permission to access these reports.

The migration reports provide summary and status based on following type of migration:

- The bot migration that includes details about the conversion of 10.x or 11.x bots to Automation 360.
- The data migration that include details about copying 10.x data to Automation 360.
- The audit migration includes details about migrated 11.x audit log data to Automation 360.

Access the reports from the **Administration > Migrations > View migration** icon associated with the migration instance for which you want to view the report.

- **Bot migration reports:** Applies to both 10.x and 11.x.

View the following information:

- Migration details such as name of the migration instance, its description, and status.
- Migration results such as the start and end time of the migration process, status of the migration, and the number of items migrated.
- General: Whether the option to overwrite files was selected.
- Run-as: Information about the run-as user selected for the migration instance.
- Bot migration results such as all the bots (parent bots and their child bots) that are migrated and their status.

Click the View migration issues icon associated with an unsuccessfully migrated bot to see the unsupported commands or attributes.

- General details about the user who created the migration instance, last modification date, and its object type.
- Bot Insight Migration Results: Applies to 11.x only.

View Bot Insight results if you have migrated 11.x analytics bots. This tab displays information such as the status of the Bot Insight migration, number of Bot Insight dashboards, and data rows that are migrated, not migrated, or skipped.

- **Data migration reports:** Applies to 10.x only.

View the following information:

- Migration details such as name of the migration instance, its description, and status.
- Data migration results such as the start and end time of the migration process, status of migration, and number of items migrated.
- Roles that are copied and their status.
- Users that are copied and their status.
- Auto-login credentials that are copied and their status.
- Bots that are copied and their status.
- Schedules that are copied and their status. The copied schedules are disabled in Automation 360 because migration of the associated devices is not supported and therefore they are not available.
- General details about the user who created the migration instance, last modification date, and its object type.

- **Audit log migration reports:** Applies to 11.x only.

View the following information:

- Migration details such as name of the migration instance, its description, and overall status of migration such as in progress, successful, or unsuccessful.
- Migration results such as the start and end time of the migration process, duration, and number of items skipped, not migrated, or migrated.
- Audit log migration results such as file path of audit log JSON files, status of each `es_export.json` file if it was skipped, not migrated, migrated, or is pending for migration. It also displays the reasons because of which a particular `es_export.json` file was skipped or unsuccessful when migrating audit logs.
- General details about the user who created the migration instance, last modification date, and its object type.

## Export to CSV

You can export two sets of data to a CSV file: the migration instances on the **All migrations** page and bot migration results data, including any action mapping for each bot. Exported data can be used for offline analysis and to identify bots that failed the migration and their associated failed actions.

For migration instance data, the export process exports all data (including hidden data columns), but only for the current page. If you have migration instances on additional pages, you must navigate to those pages to export that data. For migration result data, all pages are exported, even if the data is paginated.

Users with the "View migration" permission can perform the export.

1. Click **Administration > Migrations**.
2. **Export migration instances:**
  - a) Use the checkboxes to select the migration instances you want to export.
  - b) Click the **Export checked items to CSV** icon.
3. **Export migration results data:**
  - a) Select the migration instance where **Type** is "Bot migration" that you want to export.  
Only bot migration results can be exported.
  - b) Click the **Export bot migration results** option to export the data.  
You can also export from inside the Migration report.
4. Open the CSV file to see the exported data.

## View changes to migrated bots using Migration Assistant

Use the Migration Assistant to view a list of changes that are made in a 11.x or 10.x bot when it is migrated to the Automation 360. The Migration Assistant enables you to review all the changes made in a bot from the Bot editor.

- 11.x or 10.x bots must be migrated to Automation 360.
- The user reviewing the messages must have the Bot Creator license assigned to them.

Review messages are available for bots that are successfully migrated to Automation 360 but with some changes in the migrated bots. These review messages indicate changes in the behavior of the 11.x or 10.x commands after they are migrated to Automation 360.

You can open the Migration Assistant for a migrated bot that is listed in the **Messages** tab of the **Bot Scanner** report. Review the messages about the changes in the commands after migration and mark these messages as reviewed after analyzing the change.

1. Open the migrated bot from **Bots > My bots** for which you want to review the messages.
2. Click the migration assistant icon on the toolbar to open the **Migration Assistant**.
3. Click **Get started**.
4. On the **Migration Assistant** screen, click the **Need review** tab to list the messages that require review.
5. Click a message in the **Need review** tab to view detailed information about the change.
6. Click the **Mark as reviewed** option to mark the message as reviewed.  
The messages that are marked as reviewed are available in the **Reviewed** tab.

---

**Note:** You can mark a message as reviewed only for the migrated bots that are available in your private repository.

---

## Migrate Community Edition bots

Bots created in the 11.x Community Edition environment must be migrated to the Automation 360 Community Edition to allow users to use these bots in Automation 360. You use the Bot Migration package available in the Automation 360 Community Edition to manually migrate the bots.

Before you start migrating bots, do the following:

- Use the Bot Scanner utility to determine if your 11.x bots can be migrated successfully.  
[Bot Scanner overview](#)
- Get access to Automation 360 Community Edition.
- Register a device in Automation 360 Community Edition to run bots.

[Install Bot agent and register device](#)

This procedure migrates one bot at a time. To migrate all bots within the same folder, you can create a complex bot by iterating files in a folder in a loop or add multiple **Migrate bot** actions for each `.atmx` file you want to migrate.

---

**Important:** If a bot has dependencies on other bots, you must migrate the dependent bots first and then the parent bot. For example, the `main.atmx` parent bot has a dependency on `child1.atmx`, which also has a dependency to `child2.atmx`, then add the **Migrate bot** actions in the following order: `child2.atmx`, followed by `{{child1.atmx}}` and then `{{main.atmx}}`.

---

1. Log in to Automation 360 Community Edition.

2. Use the Bot Migration package to migrate your bots.
  - a) Navigate to **Bots > My bots**.
  - b) Click **Create New > Bot**.
  - c) Expand the **Bot Migration** package and double-click the **Migrate bot** action.
  - d) Select **Desktop file** within the **Bot file path** section.
  - e) Enter the complete path of the 11.x `.atmx` file you want to migrate.
  - f) Optional: Enter the output folder path into the **Output folder path** field to specify where you want package conversion information and errors to be stored.  
A report showing relevant information is generated for each migrated bot.
  - g) Leave the **Overwrite the file if exists** option selected (default setting) if you want this migrated bot to overwrite any bots of the same name in the Automation 360 Community Edition environment.
  - h) Save the bot.
  - i) Run the bot on the connected device to perform the migration.

Successfully migrated bots are uploaded to the Automation 360 private repository of the user who performed the migration. Only **successfully** migrated bots are migrated. Use the reports in the specified **Output folder path** to see the migration errors.

#### Related tasks

[Scan bots using Bot Scanner](#)

Before you migrate to Automation 360, it is important to verify the migration readiness of your bots. Scan the bots using Bot Scanner and analyze the generated report for information about the commands and variables used in these bots and how many of these commands and variables are supported for migration.

#### Related reference

[Bot migration package](#)

The **Bot migration** package contains the **Migrate bot** action that enables you to migrate a bot (TaskBots and MetaBots) from 10.x and 11.x to Automation 360.

## Migrate to Automation 360 IQ Bot

Migration is the process of upgrading from earlier versions of IQ Bot (11.x, 6.x, or 5.x) to the latest Automation 360 IQ Bot version. This includes replicating your existing database and repository, converting your bots to Automation 360 format, and migrating all the learning instances.

### Plan your migration

Automation 360 IQ Bot features and functionality are the same as IQ Bot 11.x. The existing 11.x content also applies to Automation 360 IQ Bot.

- Compare some of the key features of Automation 360 IQ Bot deployment models with IQ Bot release.

[Automation 360 IQ Bot feature comparison matrix](#)

- Review the IQ Bot version compatibility information.

[Automation 360 IQ Bot version compatibility](#)

- Before migrating from IQ Bot 11.x to Automation 360 IQ Bot On-Premises, ensure you have downloaded the latest version of the Database Migration Assistant from Automation Anywhere Support site.

This tool enables you to migrate data and is supported on the following Microsoft SQL Server versions:

- Microsoft SQL Server 2019 15.0 Developer Edition and Express Edition
  - Microsoft SQL Server 2016 13.0 Express Edition
  - Microsoft SQL Server 2012 Express Edition
- If you are migrating from IQ Bot 11.x to Automation 360 IQ Bot On-Premises, we recommend that you have a 3-node cluster to ensure high availability (HA) for IQ Bot.

*High availability and disaster recovery overview*

- For RabbitMQ disaster recovery (DR), we recommend that you have the same number of nodes in the primary and secondary sites to achieve same load handling capability.

Similarly, the RabbitMQ cluster setup of the secondary site must replicate the cluster setup of the primary site.

*Disaster recovery deployment model*

For RabbitMQ cluster configuration with auto-recovery, see [RabbitMQ Cluster Configuration with Auto-recovery \(A-People login required\)](#)

## Choose your migration path

Choose your migration path based on the IQ Bot version you are currently using and the Automation 360 IQ Bot deployment model that meets your business requirements.

**Important:** In earlier IQ Bot versions, five databases were created, and in Automation 360 IQ Bot a single unified database is created. So ensure you back up your existing IQ Bot databases before you start the migration.

If you are on this version	Perform this migration procedure
IQ Bot 11.3.4	Migrate to Automation 360 IQ Bot On-Premises or Cloud: <ol style="list-style-type: none"> <li>1. <a href="#">Migrate to the latest IQ Bot A2019 On-Premises version</a></li> <li>2. <a href="#">Migrate from Automation 360 IQ Bot On-Premises to Cloud</a></li> </ol> Install the latest version of Automation 360 IQ Bot On-Premises before you migrate to IQ Bot Cloud.
IQ Bot 6.5.x	You can migrate to Automation 360 IQ Bot On-Premises only from IQ Bot Version 11.3.4. <ol style="list-style-type: none"> <li>1. Update IQ Bot Version 6.5 to IQ Bot Version 11.3.4 <a href="#">Update IQ Bot from 6.5 or earlier to 11.3.4</a></li> <li>2. <a href="#">Migrate to the latest IQ Bot A2019 On-Premises version</a></li> <li>3. <a href="#">Migrate from Automation 360 IQ Bot On-Premises to Cloud</a></li> </ol> Install the latest version of Automation 360 IQ Bot On-Premises before you migrate to IQ Bot Cloud.

If you are on this version	Perform this migration procedure
IQ Bot 5.3.x (or earlier)	<ol style="list-style-type: none"> <li>1. Update to IQ Bot Version 6.5 <i>Update IQ Bot from 5.3.x or 6.0 to 6.5</i></li> <li>2. Update IQ Bot Version 6.5 to Version 11.3.4 <i>Update IQ Bot from 6.5 or earlier to 11.3.4</i></li> <li>3. <i>Migrate to the latest IQ Bot A2019 On-Premises version</i></li> <li>4. <i>Migrate from Automation 360 IQ Bot On-Premises to Cloud</i> Install the latest version of Automation 360 IQ Bot On-Premises before you migrate to IQ Bot Cloud.</li> </ol>

**Related concepts**[Install and update Automation 360 IQ Bot](#)

This collection of topics guide you through the process of installing or setting up Automation 360 IQ Bot Community Edition, On-Premises, and Cloud.

## Migrate earlier IQ Bot versions to Automation 360 IQ Bot On-Premises

Migrate from an earlier IQ Bot version (from 6.x through 11.x) to Automation 360 IQ Bot (On-Premises) for the latest features and enhancements.

1. If you are currently using any of the earlier versions of Automation Anywhere Enterprise (10.x or 11.x), ensure you migrate to the latest Automation 360 version.  
*Migrate to Automation 360*
2. Ensure the Automation 360 version corresponds to the Automation 360 IQ Bot that you are installing.  
*Automation 360 IQ Bot version compatibility*
3. Migrate to the latest Automation 360 IQ Bot On-Premises from IQ Bot Version 11.3.4 or later versions. If you are currently using any of the earlier IQ Bot versions (5.3.x), you must first perform these tasks:
  - a. Update to IQ Bot Version 6.5.  
See *Update IQ Bot from 5.3.x or 6.0 to 6.5*
  - b. Update IQ Bot Version 6.5 to IQ Bot Version 11.3.4 before migrating to Automation 360 IQ Bot On-Premises.  
See *Update IQ Bot from 6.5 or earlier to 11.3.4*

#### 4. Back up your existing IQ Bot databases.

In the earlier IQ Bot versions, five databases were created. With Automation 360 IQ Bot On-Premises Build 2545, a single unified database is created.

##### a. Ensure you back up all five databases:

- AliasData
- ClassifierData
- Configurations
- FileManager
- MLData

##### b. Uninstall any earlier IQ Bot versions.

Uninstalling an existing IQ Bot build does not delete the databases.

#### 5. Install Database Migration Assistant.

##### a. Log into Automation Anywhere support site and download the Database Migration Assistant:

[A-People Downloads page \(Login required\)](#)

##### b. Double-click the file to start the installation.

##### c. Click **Next** to continue, accept the license agreement, and click **Next**.

##### d. In the **Database Configuration** screen, enter your existing IQ Bot database host name and credentials, and click **Next**.

---

**Note:** The SQL Server Browser service must be running if you want to use the full name of the SQL Server as the host name.

---

##### e. Click **Browse** to change the default installation folder for the Database Migration Assistant.

##### f. Click **Install**.

After a successful installation, a new database called **IQBot** is created. You can use the following path to review the log files:

C:\Users\Public\Documents\Migration\_Assistant\_Logs

##### g. Back up the newly created unified database before installing the latest Automation 360 IQ Bot build.

---

**Note:** After migration to Automation 360 IQ Bot completes, output files processed in IQ Bot 11x will not be available for download through the IQ Bot package in the Control Room.

---

#### 1. Log into Automation Anywhere support site to download the latest Automation 360 IQ Bot build:

[A-People Downloads page \(Login required\)](#)

2. Extract (unzip) the `Automation_Anywhere_IQ_Bot_A2019_(Build number)` folder and run the following `.bat` files:
  - a) `CleanupRabbitMQandErlang.bat`
  - b) `CleanupRabbitMQErlangPython.bat`
  - c) `UninstallPython.bat`
  - d) `UninstallPython385.bat`

These files remove the registry entries of RabbitMQ, Erlang/OTP relevant IQ Bot Python. No other Python versions are affected.

3. Restart your machine.
4. Open `Automation_Anywhere_IQ_Bot_A2019_(Build number)` folder and run the following files again:
  - a) `CleanupRabbitMQandErlang.bat`
  - b) `CleanupRabbitMQErlangPython.bat`
  - c) `UninstallPython.bat`
  - d) `UninstallPython385.bat`

This removes any empty folders from RabbitMQ, Erlang, and Python.

5. Install the Automation 360 IQ Bot build.
6. During installation, specify the same host name where the **IQBot** database was created. Automation 360 IQ Bot automatically connects to the **IQBot** database that was created by the Database Migration Assistant before migrating the data.
7. When the installation completes, unregister IQ Bot 11.x.

*Unregistering IQ Bot from the Control Room*

8. Clear the browser cache.
9. Optional: Restart the **Cognitive Console** service if IQ Bot fails to load.
10. Register IQ Bot A360.x with the Control Room.  
x refers to the latest version of Automation 360 IQ Bot.

*Registering IQ Bot with the Control Room*

- If the login page is not displayed after registering IQ Bot A360.x, restart the Control Room services (Control Room and Control Room Reverse proxy).
- If none of the domains or dashboards are displayed when you log in to Automation 360 IQ Bot after a successful migration, perform the following steps:
  - Press the F12 key and click the **Network** tab to view the APIs.  
If the APIs are unauthorized or display an error message, restart the IQ Bot service.
  - If the bots are not displayed in the learning instances, clear the browser cache.

**11.** After the data is migrated, ensure you modify the name of the output `.csv` file.

The output `.csv` file in Automation 360 IQ Bot contains additional characters. If you are using the `download` command, use the following instructions to edit the output `.csv` filename:

- Remove the brackets [ ].
- Replace the underscore ( `_` ) character with a hyphen ( `-` ).
- Replace spaces with underscore ( `_` ).

For example, if the output `.csv` filename is `[sales-7d6 961f3d28]_Invoice.tiff`, rename it as `sales-7d6_961f3d28-Invoice.tiff`.

## Migrate from Automation 360 IQ Bot On-Premises to Cloud

IQ Bot Cloud offers all the Automation 360 IQ Bot On-Premises features through a browser-based interface.

You must install the latest version of Automation 360 IQ Bot On-Premises before migrating to IQ Bot Cloud. See [Migrate earlier IQ Bot versions to Automation 360 IQ Bot On-Premises](#) .

Users have the following options to upload the `.iqba` file to IQ Bot Cloud:

- **Migrate learning instances**

Click **Migration Utility** > **Export/Import** in Automation 360 IQ Bot On-Premises (starting from Build 5931).

[Migrate learning instances](#)

- **Generate learning instances file**

Use **Migration Utility** to generate the `.iqba` learning instance file. You can then click **Migration Utility** > **Export/Import** to upload the generated file.

[Migrate Learning Instances in IQ Bot Cloud through API \(A-People login required\)](#)

1. Use the Migration Utility feature to export learning instances from Automation 360 IQ Bot On-Premises version.
2. Use the IQ Bot UI or API to upload the `.iqba` file to IQ Bot Cloud.
3. Open IQ Bot Cloud and import learning instances using Migration Utility.

All your learning instances from Automation 360 IQ Bot On-Premises are imported and available on IQ Bot Cloud.

---

**Important:** Review the following points:

- If the learning instances are large, migrate them one at a time to avoid timeouts.
  - Migrate custom domains if you use them.
  - Import the custom domains in the same order as they were in the Automation 360 IQ Bot On-Premises version.
-

## Migrate learning instances

Use the Automation 360 IQ Bot Migration Utility feature to migrate (export and import) learning instances between environments to avoid recreating similar learning instances and easily manage the lifecycle of a learning instance and associated bots.

The migration operation requires the IQ Bot Admin role or a custom role with migration permissions.

When you export an `.iqba` file, only a single document associated with every available bot (Group) training is exported.

To migrate learning instances from one environment to another, follow these steps:

1. Log in to IQ Bot as an administrator.
2. Create a backup of the learning instances in the source environment:
  - a) Click **Administration > Migration**.
  - b) Click **Create Backup**.
  - c) Select the learning instances you want to back up and then click **Backup**.
  - d) Enter an appropriate name for the IQ Bot archive (IQBA) file and click **Backup** to begin the export process.

The name of the backup file is appended with a time stamp to make it unique. You can download this file and export it to the target environment.

The exported data file with the `.iqba` extension is available in the `BackupData` folder in your IQ Bot output directory.

**Example:** `C:\Users\Public\Documents\Automation Anywhere IQBot Platform\Output\BackupData`

3. Download the `.iqba` file to move it to the destination environment. Click the download icon next to the backup entry in the list.
4. Upload the `.iqba` file to the destination environment:
  - a) Click **Administration > Migration**.
  - b) Click **Upload**.
  - c) Select the `.iqba` file you want to upload from your file system and click **Open**.

---

**Tip:** After your file is uploaded, click **Refresh** to manually refresh the page and use the uploaded file from the list.

---

5. Click the restore icon next to the backup entry in the list to restore the uploaded backup file in the destination environment.

## Migration Utility enhancements

Starting from the Automation 360 IQ Bot.14 release, enhancements for importing learning instances (that were created using a custom domain) to the production server are available.

Migrating learning instances (that were created using a custom domain) from one system to another does not automatically import the associated domain to the target system. Therefore, when you run the imported learning instances on the production documents, the documents do not get classified because the associated field names and IDs for the custom domain do not work in the imported learning instance.

## Migrating single or multiple learning instances

**Prerequisite:** The same version of the custom domain must exist in the staging (source) and production (target) servers.

IQ Bot includes some checks for importing a learning instance to the production environment to ensure the custom domain associated with a learning instance is migrated to the production server first, so the learning instances do not fail after migration.

- You can import the same learning instance to the production server multiple times.  
However if you import a learning instance with an edited or updated domain and if the updated domain does not exist in the production server, the system will not allow you to import the learning instance.
- In this scenario, if the **Import** option is used (**IQ Bot** > **Migration** tab) to import the learning instance, a system-generated error message is displayed stating that the learning instance version is incompatible, and the import process is canceled.
- IQ Bot checks for the following when importing a learning instance to the production server:
  - Does the domain exist in the production server?
  - Do the same fields exist in the production server?
  - Do the same field aliases (available variations for a specific field in the documents) exist in the production server?
- Learning instance import fails if the system detects an issue with any of the checks.
- An import is successful when the user has maintained the same version of the custom domains, associated with the learning instance, in the staging and production servers.

If the learning instance import fails, the user can find the reason for the migration failure in the following locations:

- In the IQ Bot `Project service log` files, which will show an inconsistency in any of the following parameters:
  - domain name
  - field names
  - project or learning instance name
  - field alias names
- In the **Control Room** > **Audit logs**

*Custom domains in IQ Bot*

# Build

---

This collection of topics will get you started automating tasks and processes as quickly as possible.

## Related reference

### [Actions palette content for bot creation](#)

Use actions to build an automation workflow and to instruct a bot what to do. The available actions are located in the Actions palette of the Bot editor in the Control Room.

### [Variables overview](#)

Automation 360 offers a variety of variables, each designed to hold specific types of data and is intended for specific use. Use the topics below to learn more about each variable and how to use them.

## Related information

### [Training - Getting Started with RPA](#)

## Bot editor for creating bots

The Bot editor enables users to create and edit bots from any device, and from anywhere the user can access a web browser.

### Overview

Because Automation 360 is web-based, there is no separate client to download. Access the Bot editor by logging in to Automation 360, navigating to **BOTS > My bots**, and then opening an existing bot or by creating a new one.

The Bot editor is a web-based environment and includes the following features:

- Universal Recorder to simplify capturing processes
- Search for a bot from the public workspace and your private workspace and add that bot to the current bot.

The location of the selected bot in the public and private workspaces is also displayed.

---

**Note:** An error occurs if you add a bot from a folder in the public workspace for which you do not have the **Clone** permission for that folder.

---

- Three view options for bot creation:

- **Flow:** Graphical representation of the process (default).

---

**Note:** The Flow view is disabled when you create or edit a bot and the bot exceeds 500 lines of code. Use the **Show list view** option to navigate to the list view.

---

- **List:** Sequential entries for each action.

---

**Note:** Drag the selected action within the task logic.

---

- **Dual:** Split screen of the Flow and List views.

- Powerful bot code management
- Python and JavaScript actions support inline scripting without linking, with drag-and-drop integration
- Rich variable passing, with no cross-language mapping required

## Accessing the Bot editor

To access the Bot editor, you must start creating or modifying a bot.

Go to **My Bots** in the Control Room

- To create a bot, click the **Create TaskBot** icon on the top-right of the page.
- To modify a bot, click the bot from the list.

Watch the following video on how to get started with the Bot editor:

## More resources

- Free Automation 360 bots and command packages from Bot Store: [Automation 360 and AARI pre-built automation](#)
- [Create your first bots](#)

### Related tasks

[Run a bot](#)

You can test an automated process by running a bot.

### Related reference

[Editing bots](#)

Edit bot logic using the Bot editor to add, modify, or delete actions and automation steps.

## Actions palette content for bot creation

Use actions to build an automation workflow and to instruct a bot what to do. The available actions are located in the Actions palette of the Bot editor in the Control Room.

## Actions, packages, and dependencies

Actions are grouped into packages based on the technology they automate. For example, the Excel advanced package contains Excel-related actions, such as **Open workbook**, **Go to cell**, and **Delete cell**, which you can insert in the Bot editor to automate a spreadsheet process.

Each package is upgraded and enabled individually to support new functionality. New bots are built with the default version. Existing bots are not automatically updated. They run using the same package version that they were built with until the Bot Creator manually upgrades to the new version.

When the Control Room deploys a bot, the packages used to create the automation are collected and sent to the Bot agent on the destination device. The Bot agent caches the packages so that it does not require updates each time the bot runs.

To shorten the runtime the first time a bot runs on a device, preload the packages using the **Preload packages** option in the Bot editor. The system loads the packages to `\ProgramData\AutomationAnywhere\GlobalCache` on the local machine for quick access at runtime.

After an action from a package is used in a bot, that package becomes a dependent file of that bot.

- Learn more about managing packages in [Managing packages](#).
- Developers can learn more about creating packages in [Package Software Development Kit \(SDK\)](#).
- Learn more about managing bots and package dependencies in [Bot dependencies](#).

## Working with actions

Each action in a package provides minimum compatible Control Room and Bot agent version information when you create bots. So you can update your bots and reduce runtime errors caused by an incompatible Control Room or Bot agent version.

You can configure actions in the Bot editor. Double-click the action to view the fields and features that you can configure, and double-click or drag an action to insert it into the automation.

Move the mouse over the vertical ellipsis at the top right of an action icon to access the following features:

**Copy action**

Duplicate the action.

**Cut action**

Copy the action and remove it from the bot code.

**Paste after action**

Paste the copied action below the selected action.

---

**Note:** This option only appears when there is an action in the clipboard.

---

**Delete action**

Remove the action from the bot code.

**Disable action**

At run time, bot ignores the action until you enable it.

**Enable breakpoint**

Pauses the bot for debugging purposes.

[Debugger features](#)

You can edit multiple actions at a time, using the toolbar at the top of the Bot editor.

**Copy items**

Copy actions to a clipboard so they can be duplicated within the bot.

**Cut items**

Copy the actions and remove them from the bot code.

**Paste items**

Paste one or more actions after the highlighted action. If you have not highlighted an action, the actions are appended to the end of the automation sequence.

---

**Note:** This icon is only enabled when there are actions in the clipboard.

---

**Copy to shared clipboard**

Copy actions, triggers, and metadata to a clipboard that is shared between bots.

**Paste from shared clipboard**

Paste actions, triggers, and metadata from another bot.

---

**Note:** This icon is only enabled when there are actions in the shared clipboard.

---

## Resources

To learn more, see [Training - Install and upgrade actions without reinstallation](#). This course introduces you to packages, benefits, and installation.

---

**Note:** You must log in with a registered A-People Community [account](#) to access course.

---

Watch the following video on how to use actions in Automation 360:

### Related reference

[Bot editor for creating bots](#)

The Bot editor enables users to create and edit bots from any device, and from anywhere the user can access a web browser.

## AARI web package

The **AARI web** package contains actions that enable Control Room users to configure their bots to work on requests, tasks, and team members.

### Before you start

Ensure you have met one of the following conditions in order to run this package:

#### Condition 1

- Access to a process in an assigned team.
- Access to an AARI User license.
- A system-created **AAE\_Robotic\_Interface User** role for the AARI user.

#### Condition 2

- Access to a Bot Runner license (Attended or Unattended) or Bot Creator license.
- A user-created role with the **View My Bots** and **Run My Bots** permissions.

## Actions in the AARI web package

The **AARI web** package includes the following actions:

Action	Description
Assign Task	<p>Assigns options to a task.</p> <ul style="list-style-type: none"> <li>• In the <b>Task ID to be assigned</b> field, specify a value.</li> <li>• In the <b>User ID to assign to task</b> field, specify a value.</li> </ul> <p>For the task and user ID, you can select a value from the <b>Variable</b> or <b>Global value</b> options. The variable option enables you to add predefined variables ranging from time (minute, hour, day, month, year, etc) or system usages (CPU and RAM).</p> <ul style="list-style-type: none"> <li>• <b>Optional:</b> In the <b>Assign the result to variable</b> field, assign a variable to store as an output.</li> </ul> <p>The output is stored as a string value.</p>

Action	Description
Cancel Task	<p> Cancels a task.</p> <ul style="list-style-type: none"> <li> In the <b>Task ID to cancel</b> field, specify a value.</li> </ul> <p> For the task, you can select a value from the <b>Variable</b> or <b>Global value</b> options. The variable option enables you to add predefined variables ranging from time (minute, hour, day, month, year, etc) or system usages (CPU and RAM).</p> <ul style="list-style-type: none"> <li> <b>Optional:</b> In the <b>Assign the result to variable</b> field, assign a variable to store as an output.</li> </ul> <p> The output is stored as a string value.</p>
Create a Request	<p> Creates a request.</p> <ul style="list-style-type: none"> <li> In the <b>Enter the public repository URI of the Process</b> field, specify the uniform resource identifier (URI).</li> </ul> <hr/> <p> <b>Important:</b> The public repository URI is of the following pattern: <code>repository:///Automation%20Anywhere/Bots/My%20Folder/My%20Process%20File</code> where the whitespace characters are replaced with %20. The AARI admin can use the <b>Copy process to uri to clipboard</b> feature in the <b>Process setup</b> page in the web interface to obtain the URI data.</p> <hr/> <ul style="list-style-type: none"> <li> Specify your variable in the <b>Dictionary</b> or <b>Variable</b> field. <ul style="list-style-type: none"> <li> <b>Variable:</b> Enter your custom variable.</li> <li> <b>Dictionary:</b> Enter the variable information in the <b>Type, Key,</b> and <b>Value</b> fields. <p> In the <b>Type</b> field, choose from <b>Any, String, Number, Datetime,</b> or <b>Boolean.</b></p> </li> <li> <b>Optional:</b> In the <b>Add</b> field, add more dictionary variables.</li> </ul> </li> <li> <b>Optional:</b> In the <b>Assign the Request ID to</b> field, assign a variable to store as an output.</li> </ul> <p> The output is stored as an ID value.</p>

Action	Description
Get Storage file	<p>Download the storage file to a bot device.</p> <ul style="list-style-type: none"> <li>Specify the storage file URI in the <b>Variable</b> field.</li> </ul> <p>Enter your file input variable.</p> <hr/> <p> <b>Attention:</b> You must only use the <b>Variable</b> option and the variable must be a file input that is populated from the process (<b>Select File</b> in <b>Human Task</b>). Do not use the <b>Control Room file</b> and <b>Desktop file</b> options.</p> <hr/> <ul style="list-style-type: none"> <li>In the <b>Full path of file in local device to be saved to</b>, specify the path to store your file.</li> </ul> <p>You can select from <b>Variable</b> or <b>Global value</b> option. The variable option enables you to add a user-defined value, clipboard, string (enter, newline, separate, etc), system (task name, control room URL, etc), predefined variable package (date, minute, day, time, IP address, operating system, etc), or table analytic value.</p> <ul style="list-style-type: none"> <li><b>Optional</b> In the <b>Result</b> field, choose a variable.</li> </ul> <p>The output is stored as a variable.</p>

Action	Description
Query Requests	<p>Enables the user to query requests with custom filters.</p> <ul style="list-style-type: none"> <li>• Select a filter.</li> </ul> <hr/> <p><b>Note:</b> The filters for process and request titles, tags, IDs, and PII tags have the same list of options.</p> <hr/> <ul style="list-style-type: none"> <li>• Specify the string value in the <b>List</b> or <b>Variable</b> field. <ul style="list-style-type: none"> <li>• Specify your type in the <b>List</b> or <b>Variable</b> field.</li> <li>• <b>List:</b> Input your value information in the <b>Type</b> and <b>Value at 0</b> fields.</li> <li>• <b>Optional:</b> In the <b>Add</b> field, add more values.</li> <li>• <b>Variable:</b> Enter your custom variable.</li> </ul> </li> <li>• In the <b>Request Status</b> field, select a status. You can choose <b>OPENED</b>, <b>SUCCESS</b>, <b>ERROR</b>, and <b>CANCELLED</b></li> <li>• In the <b>Page</b> field, specify a value. <ul style="list-style-type: none"> <li>• In the <b>Table start at offset of data</b> field, enter a value.</li> <li>• In the <b>Number of rows per page</b> field, enter a value. The default value is set <b>200</b> for number of rows.</li> </ul> </li> <li>• In the <b>Sort</b> field, specify the option. <ul style="list-style-type: none"> <li>• In the <b>Direction</b> field, select <b>Descending</b> or <b>Ascending</b>. The default value is set to <b>Descending</b> for the direction.</li> <li>• In the <b>Select sort column</b> field, select an option. You can choose between process title or the request creation, ID, title, status, or PII tag.</li> <li>• Select the <b>Enable 2nd degree sort</b> and specify the <b>Direction</b> and <b>Select sort column</b> fields.</li> </ul> </li> <li>• In the <b>Assign the result to variable</b> field, assign a variable to store as an output. The output is stored as a table value.</li> </ul>

Action	Description
Query Tasks	<p>Enables a user to query tasks with custom filters.</p> <ul style="list-style-type: none"> <li>• Select a filter.</li> </ul> <hr/> <p><b>Note:</b> The filter for process and request titles, tags, IDs, status, and PII tags provide the same list of options.</p> <hr/> <ul style="list-style-type: none"> <li>• Specify the string value in the <b>List</b> or <b>Variable</b> field. <ul style="list-style-type: none"> <li>• Specify your type in the <b>List</b> or <b>Variable</b> field.</li> <li>• <b>List:</b> Input the value information in the <b>Type</b> and <b>Value at 0</b> fields.</li> <li>• <b>Optional:</b> In the <b>Add</b> field, add more values.</li> <li>• <b>Variable:</b> Enter your custom variable.</li> </ul> </li> <li>• In the <b>Request Status</b> field, select a status. You can choose <b>OPENED, SUCCESS, ERROR,</b> and <b>CANCELLED</b></li> <li>• In the <b>Task State</b> field, select a status. You can choose <b>IN_PROGRESS</b> and <b>COMPLETED</b>.</li> <li>• In the <b>Page</b> field, specify a value. <ul style="list-style-type: none"> <li>• In the <b>Table start at offset of data</b> field, enter a value.</li> <li>• In the <b>Number of rows per page</b> field, update the value. The default value is set to <b>200</b> for number of rows.</li> </ul> </li> <li>• In the <b>Sort</b> field, specify the following options. <ul style="list-style-type: none"> <li>• In the <b>Direction</b> field, select <b>Descending</b> or <b>Ascending</b>. The default is <b>Descending</b> for the direction.</li> <li>• In the <b>Select sort column</b> field, select an option. You can choose from the request and tasks IDs, titles, creation, status, or PII tags.</li> <li>• Select the <b>Enable 2nd degree sort</b> and specify the <b>Direction</b> and <b>Select sort column</b> fields.</li> </ul> </li> <li>• In the <b>Assign the result to variable</b> field, assign a variable to store as an output. The output is stored as a table value.</li> </ul>
Team Members	<p>Retrieves the list of members of a team.</p> <ul style="list-style-type: none"> <li>• In the <b>Supply team ID to query it's members</b> field, specify a value. For the supply team ID, you can select a value from the <b>Variable</b> or <b>Global value</b> options. The variable option enables you to add predefined variables ranging from time (minute, hour, day, month, year, etc) or system usages (CPU and RAM).</li> <li>• In the <b>Assign the result to variable</b> field, assign a variable to store as an output. The output is stored as a table value.</li> </ul>

## Active Directory package

Use the **Active Directory** package to automate actions in the Active Directory. An Active Directory is a directory service provided by Microsoft to assist the admin in managing users across a group or organization.

RPA Workspace uses Lightweight Directory Access Protocol (LDAP) to read from and edit users in the Active Directory. The server and domain names are combined to create an LDAP path, which is used to connect to the Active Directory.

### Before you start

Perform the following actions within the **Active Directory** package as part of using the set of available actions:

1. Establish a connection with the Active Directory using the **Connect** action. Use this same session name for the other actions. *Using the Connect action*
2. Use the actions to automate a task.
3. After you have automated all the Active Directory-related tasks, terminate the connection to the server using the **Disconnect** action.

### Operations in the Active Directory package

The **Active Directory** package includes the following operations:

Operation	Description
Computer operations	See <i>Computer operations</i> .
Group operations	See <i>Group operations</i> .
LDAP operations	See <i>LDAP operations</i> .
Organizational unit operations	See <i>Organizational unit operations</i> .
User account operations	See <i>User account operations</i> .

### Computer operations

The computer operations in the Active Directory package contain various actions to automate tasks related to computers, including create, delete, get property, rename, and set property.

### Actions in the Active Directory package

The **Active Directory** package includes the following actions for computer operations:

Action	Description
Create computer	Creates a new object for the computer. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter a name for the computer.</li> <li>• <b>Optional:</b> Enter a description of the computer.</li> </ul>
Delete computer	Deletes an existing computer. <ul style="list-style-type: none"> <li>• .Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter a name for the computer.</li> </ul>
Get computer property	Retrieves a specific property value for a computer. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the computer name.</li> <li>• Enter the property.</li> <li>• Assign the value to a string variable.</li> </ul>
Move computer	<i>Using the Move computer action</i>
Rename computer	Renames an existing computer. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter a name for the computer.</li> <li>• Enter a new name for the computer.</li> </ul>
Set computer property	Assigns a value to a computer property. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the computer name.</li> <li>• Enter the property to update.</li> <li>• Enter the new value.</li> </ul>

#### *Using the Move computer action*

Use the Move computer action to move the computer from an existing location to a new location.

Ensure there is an existing computer.

#### *Computer operations*

1. In the **Actions** palette, double-click or drag the **Move computer** action from the **Active Directory** package.

2. Add the computer name:
  - Select the name from the server:
    - a. Click **Add computer from server**.
    - b. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - c. In the **Select computer** window, select the computer name from the **Domain Objects** panel and click **Apply**.
  - Enter the name in the **Computer name** field.
3. Add the LDAP path: or perform the following steps if you choose the option :
  - Enter the path in the **Move to** field.
  - Click **Select computer object** and perform these steps:
    - a. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - b. In the **Select computer** window, select the destination server path from the **Domain Objects** panel and click **Apply**.
4. Enter the same session name in the **Active Directory session** that you used in the **Connect** action.
5. Click **Save** and **Apply**.

## Group operations

The group operations in the Active Directory package contain various actions to automate tasks related to groups, including create, delete, get property, and set property.

## Actions in the Active Directory package

The **Active Directory** package includes the following actions for group operations:

Action	Description
Create group	<p>Creates a new group.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter a unique name for the group.</li> <li>• <b>Optional:</b> Enter a description for the group.</li> <li>• Select the group scope from the following options:               <ul style="list-style-type: none"> <li>• <b>Domain Local</b></li> <li>• <b>Global</b></li> <li>• <b>Universal</b></li> </ul> </li> </ul> <p><i>Group scope</i></p> <ul style="list-style-type: none"> <li>• Select the group type from the following options:               <ul style="list-style-type: none"> <li>• <b>Security:</b> Provides users with access rights to folders.</li> <li>• <b>Distribution:</b> Sends emails to a group of users.</li> </ul> </li> </ul>

Action	Description
Delete group	<p>Deletes an existing group.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the name of the group to delete.</li> </ul>
Get group property	<p>Retrieves a specific property value for the group.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the group name.</li> <li>• Enter the property.</li> <li>• Assign the value to a string variable.</li> </ul>
Rename group	<p>Renames an existing group.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the group name.</li> <li>• Enter a new name for the group.</li> </ul>
Set group property	<p>Assigns a value to a group property.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the group name.</li> <li>• Enter the property to update.</li> <li>• Enter the new value.</li> </ul>

## LDAP operations

The Lightweight Directory Access Protocol (LDAP) operations in the Active Directory package contain various actions to automate tasks related to LDAP, including connect, disconnect, and run query.

### Actions in the Active Directory package

The **Active Directory** package includes the following actions for LDAP operations:

Action	Description
Connect	<i>Using the Connect action</i>
Disconnect	Closes the connection with the LDAP server.

Action	Description
Run query	<p>Runs a specified Active Directory query. The query results are stored in a list variable, either for object names or LDAP paths, depending on the option selected. You must:</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Input the query. For example: (&amp;(objectCategory=person)(objectClass=user)(name=A*))</li> <li>• Specify the return type. Select either the <b>Object Name</b> or <b>LDAP Path</b> option.</li> <li>• Assign the value to a string variable.</li> </ul>

#### Using the Connect action

Use the **Connect** action to establish a connection with an Active Directory server. This is the first action you must use to automate an Active Directory related task.

This action enables you to provide the server credentials and details, and associate this information with a session name. Use this same session name for the other Active Directory actions so that you have to provide the server information only once.

To establish a connection with an Active Directory server, follow these steps:

1. In the **Actions** palette, double-click or drag the **Connect** action from the **Active Directory** package.
2. Enter a session name.
3. Enter or create the LDAP URL:
  - **Parent path:** Enter the LDAP URL that identifies the server that hosts the Active Directory services.  
For example, `LDAP://192.168.2.60/DC=corporate,DC=com`
  - **Build parent path:** Create the LDAP URL:
    - a. Click the **Build parent path** option to connect to the Active Directory server.
    - b. In the **Connect to server** window, enter the host and domain credentials, and click **Connect**.
    - c. In the **Object Explorer** window, select the specific path from the **Objects** panel.
    - d. Verify the selected LDAP URL path in the **Preview** field and click **Apply**.
4. In the **Login user** field, provide your username with one of the following options:
  - **Credential:** Select a credential from the Credential Vault. *Credentials and credential variables in the Bot editor*
  - **Variable:** Select a variable holding a credential data type value. *Your variables (user-defined)*
  - **Insecure string:** Enter a value or select a variable.



**Attention:** Values entered using this option are not encrypted.

5. In the **Login password** field, provide your password with one of the following options:

- **Credential:** Select a credential from the Credential Vault. *Credentials and credential variables in the Bot editor*
- **Variable:** Select a variable holding a credential data type value. *Your variables (user-defined)*
- **Insecure string:** Enter a value or select a variable.



**Attention:** Values entered using this option are not encrypted.

6. Click **Save**.

## Organizational unit operations

The organizational unit operations in the Active Directory package contain various actions to automate tasks related to organizational units, including create, delete, and rename organizational units, and get and set property.

### Actions in the Active Directory package

The **Active Directory** package includes the following actions for organizational unit operations:

Action	Description
Create organizational unit	Creates a new object for the organizational unit. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter a name for the organizational unit.</li> <li>• <b>Optional:</b> Enter a description of the organizational unit.</li> </ul>
Delete organizational unit	Deletes an existing organizational unit. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the name of the organizational unit to delete.</li> </ul>
Get organizational unit property	Retrieves a specific property value for an organization and assigns the results to a variable. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the organizational unit name.</li> <li>• Enter the property.</li> <li>• Assign the retrieved value to a string variable.</li> </ul>
Move organizational unit	<i>Using the Move organizational unit action</i>
Rename organizational unit	Renames an existing organizational unit. <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the name of the organizational unit to rename.</li> <li>• Enter the new name.</li> </ul>

Action	Description
Set organizational unit property	<p>Assigns a value to an organizational property.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Enter the organizational unit name.</li> <li>• Enter the property to update.</li> <li>• Enter the new value.</li> </ul>

#### *Using the Move organizational unit action*

Use the Move organizational unit action to move an organizational unit from an existing location to a new location.

Ensure there is an existing organizational unit.

#### *Organizational unit operations*

1. In the **Actions** palette, double-click or drag the **Move organizational unit** action from the **Active Directory** package.
2. Add the organizational unit name:
  - Add the name from the server by performing these steps:
    - a. Click **Add organizational units from server**.
    - b. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - c. In the **Select organizational unit** window, select the organizational unit name from the **Domain Objects** panel and click **Apply**.
  - Enter the name in the **Organizational unit name** field.
3. Add the LDAP path: or perform the following steps if you choose the option **Select organizational unit object**
  - Enter the path in the **Move to** field.
  - **Select organizational unit object** and perform these steps:
    - a. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - b. In the **Select organizational unit** window, select the destination server path from the **Domain Objects** panel and click **Apply**.
4. Enter the same session name in the **Active Directory session** that you used in the **Connect** action.
5. Click **Save** and **Apply**.

## User account operations

The Active Directory package contains various actions to automate tasks related to user account management, including create, delete, get property, remove, rename, and set property.

## Actions in the Active Directory package

The **Active Directory** package includes the following actions for user account operations:

Action	Description
Add users to group	See <a href="#">Using the Add users to group action.</a>
Create user	See <a href="#">Using the Create user action.</a>
Change user password	<p>Changes the user password.</p> <ul style="list-style-type: none"> <li>Enter the user name. You can select <b>Credential</b> to use a value available in the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually enter a user name.</li> <li>Enter the new password. You can select <b>Credential</b> to use a value available in the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually enter a password.</li> <li>Enter the same session name in the <b>Active Directory session</b> that you used in the <b>Connect</b> action.</li> </ul>
Delete user	<p>Deletes the user.</p> <ul style="list-style-type: none"> <li>Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>Select whether to search for the user by <b>User name</b> or <b>Logon name</b>.</li> </ul>
Disable user account	<p>Disables a user account.</p> <ul style="list-style-type: none"> <li>Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>Select whether to search for the user by <b>User name</b> or <b>Logon name</b>.</li> </ul>
Enable user account	<p>Enables a user account.</p> <ul style="list-style-type: none"> <li>Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>Select whether to search for the user by <b>User name</b> or <b>Logon name</b>.</li> </ul>
Get all users of a group	<p>Retrieves a list of all the users of a group, and assigns the results to a variable.</p> <ul style="list-style-type: none"> <li>Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>Enter the group name.</li> <li>Specify the return type. Select either the <b>Object Name</b> or <b>LDAP Path</b> option.</li> <li>Assign the value to a string variable.</li> </ul>
Get user property	<p>Retrieves a specific property value for a user and assigns the results to a variable.</p> <ul style="list-style-type: none"> <li>Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>Select whether to search for the user by <b>User name</b> or <b>Logon name</b>.</li> <li>Enter the property.</li> <li>Assign value to a string variable.</li> </ul>
Remove users from group	<a href="#">Using the Remove users from group action.</a>

Action	Description
Rename user	<p>Renames the user logon name or the user account name.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Select whether to search for the user by <b>User name</b> or <b>Logon name</b>.</li> <li>• Enter the name to search for.</li> <li>• In the <b>New name</b> field, enter the updated name.</li> <li>• Select from the following options to specify what to update: <ul style="list-style-type: none"> <li>• <b>Rename user name</b></li> <li>• <b>Rename logon name</b></li> <li>• <b>Rename user and logon name</b></li> </ul> </li> </ul>
Set user property	<p>Enables you to assign a value to a user property, view the current details, and update it.</p> <ul style="list-style-type: none"> <li>• Enter the same session name as the one you used in the <b>Connect</b> action.</li> <li>• Select whether to search for the user by <b>User name</b> or <b>Logon name</b>.</li> <li>• Enter the property to update.</li> <li>• Enter the new value.</li> </ul>
Update account options	<p>Sets account attributes for the user.</p> <ul style="list-style-type: none"> <li>• Specify the user name. You can select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually enter a user name.</li> <li>• Select the status of the user as <b>Active</b> or <b>Inactive</b>.</li> <li>• Select an option indicating whether the user can change their password at the next login or not.</li> </ul> <p>If you choose the <b>Don't require password change at next login</b> option, you have additional options to select.</p> <ul style="list-style-type: none"> <li>• <b>User can't change password</b></li> <li>• <b>Password doesn't expire</b></li> </ul> <ul style="list-style-type: none"> <li>• Enter the same session name in the <b>Active Directory session</b> that you used in the <b>Connect</b> action.</li> </ul>
Update user details	See <a href="#">Using the Update user details action</a>

#### *Using the Create user action*

Use the **Create user** action to configure and activate a new user.

Connect to the Active Directory server.

#### *Using the Connect action*

1. In the **Actions** palette, double-click or drag the **Create user** action from the **Active Directory** package.
2. In the **Session name** field, enter the session name that you provided in the **Connect** action.
3. Enter a user name.  
For example, John Smith.

4. Enter the logon name.  
The user will use this value to log in to the account.  
For example, john.smith.
5. Enter the user's first name.
6. Optional: Enter these user details: last name, display name, initials, email address, description, department, and title.
7. Select **Active user** to activate the user.
8. Select the **Password settings** check box to set the password for the user.
9. Enter the password.  
You can select **Credential** to use a value from the Credential Vault, **Variable** to use a credential variable, or **Insecure string** to manually enter a password.
10. Select the option that enables the user to either change or not change their password at the next login.  
If you choose the **Don't require password change at next login** option, you have additional options to select.
  - **User can't change password**
  - **Password doesn't expire**
11. Click **Save**.

#### *Using the Add users to group action*

Use the **Add user to group** action to add an existing user to a user-created group.

Ensure there is an existing user and group.

#### *User account operations | Group operations*

1. In the **Actions** palette, double-click or drag the **Add users to group** action from the **Active Directory** package.
2. From the **Select user** field, select one of the following options:
  - **Add user manually:** Enter the **Name** and **Ldap path** of the user in the **Add user** window and click **Add**.
  - **Add users from server:** Add an existing user from the server:
    - a. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - b. In the **Select user** window, select the user from the **Objects** panel and click **Add user**.

The user name and LDAP path of the user is added in the **Select user** table.

3. Add the user to the specified group by choosing one of the following options:
  - **Group name:** Enter the group name to add the existing user to a specific group.
  - **Select user group:** Add an existing user to a group:
    - a. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - b. In the **Select user** window, select the group from the **Objects** panel to add user to the destination group and click **Apply**.
4. Enter the same session name in the **Active Directory session** that you used in the **Connect** action.
5. Click **Save** and **Apply**.

*Using the Remove users from group action*

Use the Remove users from group action to remove a user from a group.

Ensure there is an existing user assigned to a group.

*Using the Add users to group action*

1. In the **Actions** palette, double-click or drag the **Remove users from group** action from the **Active Directory** package.
2. From the **Select user** field, select one of the following options:
  - **Add user manually**: Enter the **Name** and **Ldap path** of the user in the **Add user** window and click **Add**.
  - **Add users from server**: Add an existing user from the server:
    - a. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - b. In the **Select user** window, select the user from the **Objects** panel and click **Add user**.

The user name and LDAP path of the user is added in the **Select user** table.

3. To remove the user from a group, select one of the following options:
  - **Group name**: Enter the group name to remove the existing user from a group.
  - **Select user group**: Remove an existing user from a group.
    - a. Enter the host and domain credentials in the **Connect to server** window and click **Connect**.
    - b. In the **Select user** window, select the group from the **Objects** panel to remove user from the group and click **Apply**.
4. Enter the same session name in the **Active Directory session** as you used in the **Connect** action.
5. Click **Save** and **Apply**

*Using the Update user details action*

Use this action to update the details of a user.

Connect to the Active Directory server.

*Using the Connect action*

1. In the **Actions** palette, double-click or drag the **Update user details** action from the **Active Directory** package.
2. In the **Session name** field, enter the session name that you provided in the **Connect** action.
3. Select whether to search for the user by **User name** or **Logon name**.
4. Enter the user's first name.
5. Optional: Enter the following user details: last name, display name, initials, email address, description, department, and title.
6. Click **Save**.

## Analyze package

Use the actions in the **Analyze** package to specify the actions and variables to use in the Bot Insight dashboard and widgets. The **Analyze** package enables you to perform transactional analytics for the data that is logged by the variables when the bot runs.

### Actions in the **Analyze** package

The **Analyze** package includes the following actions:

Action	Description
Close	<p>Closes the transaction.</p> <ul style="list-style-type: none"> <li>In the <b>Transaction name</b> field, enter the transaction name that you provided in the <b>Open</b> action.</li> <li>In the <b>Dictionary variable</b>, select the following options: <ul style="list-style-type: none"> <li><b>All user-defined variables</b>: Include all the string, numeric, and date time user-defined variables from the bot to populate the Bot Insight dashboards.</li> <li>Manually select which variables to include in the Bot Insight dashboards.</li> </ul> </li> </ul>
Open	<p>Opens the transaction. Insert the actions that you want to include for analysis between the <b>Open</b> and <b>Close</b> actions. In the <b>Transaction name</b> field, enter the transaction name.</p>

---

**Note:** For an example of building a bot to retrieve data from a website to create visualizations in Bot Insight, [Build a Bot Insight dashboard bot](#).

---

## App Integration package

Use the actions in the App Integration package to extract text from a window and save it to a string variable.

The App Integration package supports the following technologies:

- UNIX shells, such as Cygwin, PowerShell, and GIT shell
- Windows applications, such as Calculator, Command Prompt, and Notepad

The actions in the App Integration package are based on legacy technology and have certain limitations on specific applications. To seamlessly obtain data from applications and browsers, use the [Recorder package](#).

### Building bots with actions from the App Integration package

1. Open the application or file from which you want to capture the text using the **Application > Open program/file** action.

[Application package](#)

2. Extract the text using one of the actions from the App Integration package.

3. Use any of the following actions from the String package to manipulate the captured text:
- **Extract text:** Extracts text from the source string using logical operators.
  - **Split:** Splits the string into multiple strings and stores the output in a list variable.
  - **Trim:** Trims blanks and white spaces from a string.

### *String package*

## Actions in the App Integration package

The **App Integration** package includes the following actions:

Action	Description
<b>Capture area</b>	<p>Extracts text from within the captured area of a window and saves it to a string variable.</p> <ul style="list-style-type: none"> <li>• In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li>• <b>Application:</b> Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li>• <b>Browser:</b> Select from a list of Google Chrome tabs.</li> <li>• <b>Variable:</b> Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li>• Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> </li> <li>• <b>Optional:</b> Select the <b>Resize window</b> option to specify the window dimensions. <p>This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p> </li> <li>• Click <b>Capture region</b> and select the area to capture.</li> <li>• In the <b>Save captured text to a variable</b> field, select a string variable.</li> </ul>

Action	Description
<b>Capture scrollable text</b>	<p>Captures scrollable text from the specified window.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> </li> <li><b>Optional</b>: Select the <b>Resize window</b> option to specify the window dimensions. <p>This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p> </li> <li>Click <b>Capture coordinate</b> to capture the coordinates of the window or a specific control within the window.</li> <li>In the <b>Save captured text to a variable</b> field, select a string variable.</li> </ul> <hr/> <p><b>Note:</b> The PowerBuilder application is currently not supported.</p>
<b>Capture text of window</b>	<p>Extracts all the text from a window and saves it to a string variable.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li><b>Optional</b>: Select the <b>Resize window</b> option to specify the window dimensions. <p>This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p> </li> <li>In the <b>Save captured text to a variable</b> field, select a string variable.</li> </ul>

## Application package

Use the **Open Program/File** action in the **Application** package to launch an application or a file. This action supports .exe, .bat, script files, or shortcut paths.

### Actions in the Application package

The **Application** package includes the following action:

Action	Description
Open program/file	<p>Opens an application or file.</p> <ul style="list-style-type: none"> <li>Enter the name of the application or file, or insert a variable. For example, <code>chrome.exe</code>.</li> </ul> <hr/> <p><b>Note:</b> You can also enter the full file path in this field.</p> <hr/> <ul style="list-style-type: none"> <li><b>Optional:</b> Enter the location of the file that you want to use to open the application in the <b>Start in path</b> field.</li> </ul> <p>For example, <code>C:\Program Files (x86)\Google\Chrome\Application\</code></p> <ul style="list-style-type: none"> <li><b>Optional:</b> In the <b>Parameters</b> field, specify the parameters or arguments you want to pass to the program.</li> </ul> <p>For example, if you are using the command line, enter the arguments in this field.</p>

## AWS Comprehend NLP package

The **AWS Comprehend NLP** package contains actions that enable you to connect to and consume the Amazon Comprehend API to identify the language, sentiment, key phrases, and entities.

### Before you start

You require the following information for an existing AWS account to use these actions:

- **Access key** and **Secret key:** Credentials that authenticate Automation 360 with your AWS account.  
See [Access Keys \(Access Key ID and Secret Access Key\)](#).
- **Region:** Specifies the AWS service endpoint.  
See [AWS Service Endpoints](#).

## Actions in the AWS Comprehend NLP package

Action	Description
<b>Detect language</b>	Identifies the language of the provided content and returns it in ISO 639-1 language code. The output is stored in a string variable. This action supports over 100 languages. For the full list, see <a href="#">Detect the Dominant Language</a> .
<b>Get key phrases</b>	Identifies the main points and returns a list of key phrases. For example, if the input text is about a basketball game, this action returns the names of teams, the name of the venue, and the final score.
<b>Get named entities</b>	Identifies the entities in the provided content such as people, places, organizations, date/time, quantities, branded products, and book titles.  The output is stored in a dictionary variable, where each name is a key, and the corresponding entity is the value.
<b>Get sentiment</b>	Analyzes the provided content and returns the overall sentiment and scores for all possible sentiments. An example output of the dictionary values:  <pre>POSITIVE {Positive: 0.66238534, Negative: 0.0013064129, Neutral: 0.33621928, Mixed: 8.892125E-5}</pre> The output is stored in a dictionary variable containing two keys and their corresponding values: <code>sentiment</code> and <code>score</code> .

## Boolean package

The **Boolean** package contains actions that enable you to do various operations on Boolean values.

### Actions in the Boolean package

The actions in the **Boolean** package accept a variable as an input and assign the output to a variable. These actions enable you to compare two Boolean values, convert a Boolean value to a string or numeric value, and convert a string value to a Boolean value.

The **Boolean** package includes the following actions:

Action	Description
Assign	<p>Assigns a constant value (True or False) or a user-defined value to a Boolean value.</p> <ul style="list-style-type: none"> <li>Select the source Boolean variable or value.</li> <li>Select the variable to use to store the output from the <b>Destination Boolean variable</b> list.</li> </ul> <p>The output is stored in a Boolean variable.</p>

Action	Description
Compare to	<p>Compares two Boolean values and assigns the output to a numeric variable.</p> <ul style="list-style-type: none"> <li>• Select the Boolean variables to compare from the <b>Select the first Boolean variable</b> and <b>Select the second Boolean variable</b> lists.</li> <li>• Select the variable to use to store the output from the <b>Assign the output to number variable</b> list.</li> </ul> <p>The output is stored in a number variable.</p>
Equal to	<p>Verifies whether the two Boolean values are equal or not, and assigns the output to a Boolean variable.</p> <ul style="list-style-type: none"> <li>• Select the variables that contain the Boolean values to verify from the <b>Select the first Boolean variable</b> and <b>Select the second Boolean variable</b> lists.</li> <li>• Select the variable to use to store the output from the <b>Assign the output to number variable</b> list.</li> </ul> <p>The output is stored in a number variable.</p>
Invert	<p>Converts a Boolean value to the opposite value (True to False and False to True), and assigns the output to a variable.</p> <ul style="list-style-type: none"> <li>• Select the Boolean value to convert. Choose from <b>False</b>, <b>True</b>, or a <b>Variable</b>.</li> <li>• Select the numeric variable to use to store the converted value from the <b>Assign the output to variable</b> list.</li> </ul>
To number	<p>Converts a Boolean value to a numeric value. This action converts True to 1 and False to 0.</p> <ul style="list-style-type: none"> <li>• Select the Boolean variable to convert from the <b>Select Boolean variable</b> list.</li> <li>• Select the numeric variable to use to store the converted value from the <b>Assign the output to variable</b> list.</li> </ul>
To string	<p>Converts a Boolean value to a string value.</p> <ul style="list-style-type: none"> <li>• Select the Boolean variable to convert from the <b>Select Boolean variable</b> list.</li> <li>• Select the string variable to use to store the converted value from the <b>Select the string variable to store the result</b> list.</li> </ul>

### Compare results for the Compare to action

The following table illustrates how two Boolean values are compared using the **Compare to** action and their output:

Boolean value 1	Boolean value 2	Compare result
True	True	0
True	False	1

<b>False</b>	<b>True</b>	-1
<b>False</b>	<b>False</b>	0

### Compare results for the Equal to action

The following table illustrates how two Boolean values are compared using the **Equal to** action and their output:

<b>Boolean value 1</b>	<b>Boolean value 2</b>	<b>Equal result</b>
<b>True</b>	<b>True</b>	<b>True</b>
<b>True</b>	<b>False</b>	<b>False</b>
<b>False</b>	<b>True</b>	<b>False</b>
<b>False</b>	<b>False</b>	<b>True</b>

### Bot migration package

The **Bot migration** package contains the **Migrate bot** action that enables you to migrate a bot (TaskBots and MetaBots) from 10.x and 11.x to Automation 360.

*Supported versions for migration*

---

**Important:** We recommend you to use the Bot Migration Wizard to migrate 11.x or 10.x bots to Automation 360.

The **Bot migration** package does not migrate dependencies and other entities such as credential variables, **AAApplicationPath** system variable, and global values that are required to run the migrated bot.

---

### Action in the **Bot migration** package

The **Bot migration** package includes the following action:

Action	Description
Migrate bot	<p>Migrates the version 10.x and 11.x bot file to Automation 360 format and uploads the migrated file to the specified location in your private repository with the same name as .atmx and .mbot file. This action only migrates the bot you specify, but does not migrate its dependencies. Dependencies are the bots and other files that are required to run the bot. You need to migrate the dependent bots separately and upload other files manually to Control Room.</p> <p>All the bots migrated using the <b>Bot migration</b> package are stored in the <code>Bots</code> folder in Automation 360. If you have migrate a parent bot and its child bots separately using the <b>Bot migration</b> package, you must create the same folder structure as in 11.x or 10.x and move the dependent bots to these folders for the parent bot to run successfully.</p> <ul style="list-style-type: none"> <li>• Use the <b>Control Room file</b>, <b>Desktop file</b>, or <b>Variable</b> tab to specify the location of the bot you want to migrate.</li> <li>• In the <b>Output folder path</b> field, specify the location where you want to save the log files generated for the bot migration.</li> </ul> <hr/> <p><b>Note:</b> Ensure that the location you have specified exists on the device.</p> <hr/> <p>The system does not upload the bot if it fails during the migration process. The system creates an XML report at the same location that provides information that helps you to troubleshoot if the system encounters an error during migrating the bot file.</p> <ul style="list-style-type: none"> <li>• Select the <b>Overwrite the file if exists</b> check box to overwrite an existing bot file.</li> <li>• Set a time-out value for migrating the bots within the range of 3 through 90 minutes (default value is 90 minutes).</li> </ul> <p>If the migration of any specific bot is not completed within the set time, the bot will display a timeout message with the reason for the failure and the migration process will move on to the next bot.</p>

### Related concepts

#### [Migrate to Automation 360](#)

Migration is the process of upgrading from 11.x or 10.x to Automation 360. Migration includes but is not limited to replicating and updating your existing database and repository, converting your bots to the Automation 360 format, and migrating learning instances for IQ Bot and dashboards for Bot Insight.

## Browser package

The **Browser** package contains actions that enable you to download files, find broken links, and launch a website. This package supports Internet Explorer, Microsoft Edge and Google Chrome browsers.

### Actions in the Browser package

The **Browser** package includes the following actions:

Action	Description
Close	<p>Closes a browser window or tab.</p> <hr/> <p><b>Note:</b> This action is only available for the Google Chrome browser.</p> <hr/> <ul style="list-style-type: none"> <li>• Select to close the tab, window, or all browsers: <ul style="list-style-type: none"> <li>• <b>Tab:</b> Closes the selected tab. Select the tab from the list of active tabs in the Google Chrome browser or insert a window variable.</li> </ul> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p></li> <li>• <b>Window:</b> Closes the window of the selected tab. Select the window from the list of active windows in the Google Chrome browser or insert a window variable.</li> </ul> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern. <li>• <b>All browsers:</b> Closes all open browsers except the windows that contain Control Room instances.</li> <li>• <b>Optional:</b> In the <b>Time out after</b> field, enter the number of seconds the bot must wait for the browser window or tab to close before the bot fails.</li> <hr/> <p><b>Recommended:</b> Enter a timeout value of at least 9 seconds.</p> <hr/> </p>
Download files	<p>Downloads and saves files from URLs.</p> <ul style="list-style-type: none"> <li>• Specify the <b>URL of the file</b> you want to download.</li> <li>• In the <b>Save to location</b> field, enter the location where you want to save the file.</li> </ul>
Find broken links	See <a href="#">Using Find broken links action</a> .

Action	Description
Get source code	<p>Retrieves the source code of a web page and saves it to a string variable.</p> <hr/> <p><b>Note:</b> This action is only available for the Google Chrome browser.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the browser tab from the list of active tabs in the Google Chrome browser or insert a window type variable.</li> <li>• <b>Optional:</b> In the <b>Time out after</b> field, enter the number of seconds the bot must wait for the browser window or tab to close before the bot fails.</li> </ul> <hr/> <p><b>Recommended:</b> Enter a timeout value of at least 9 seconds.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> Select a variable to hold the action output. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Go back	<p>Returns to a web page that you previously visited in the current tab. This action simulates clicking the browser <b>Back</b> option.</p> <hr/> <p><b>Note:</b> This action is only available for the Google Chrome browser.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the tab from the list of active tabs in the Google Chrome browser or insert a window variable.</li> <li>• In the <b>Number of steps</b> field, enter the number of pages to go back.</li> <li>• <b>Optional:</b> Select the <b>Throw an error if steps exceed history</b> option to make the bot fail if the number entered in the previous step is greater than the number of pages visited.</li> </ul> <p>If you leave this option deselected, when the bot runs, it will return the tab to the first web page it opened.</p> <ul style="list-style-type: none"> <li>• <b>Optional:</b> In the <b>Time out after</b> field, enter the number of seconds the bot must wait for the browser window or tab to close before the bot fails.</li> </ul> <hr/> <p><b>Recommended:</b> Enter a timeout value of at least 9 seconds.</p> <hr/>

Action	Description
Launch website	<p>Launches the browser.</p> <ul style="list-style-type: none"><li>• In the <b>URL</b> field, specify the website you want to open.</li><li>• Select your browser from the following:<ul style="list-style-type: none"><li>• Default Browser</li><li>• Internet Explorer</li><li>• Microsoft Edge</li><li>• Google Chrome</li></ul></li></ul> <p>Ensure that Internet Explorer, Microsoft Edge or Google Chrome is set as the default browser.</p> <hr/> <p><b>Note:</b> If any browser that is not listed is set as the default browser for the device, the bot might encounter an error. When actions such as OCR and Image Recognition are used, the browser must finish rendering before the Microsoft Edge execute.</p> <hr/>

Action	Description
Open	<p>Opens the browser to a specific web page.</p> <ul style="list-style-type: none"> <li>• Select to open the web page in an existing tab, new tab, or new window: <ul style="list-style-type: none"> <li>• <b>Existing tab:</b> Opens the web page in a currently open tab. Select the tab from the list of active tabs in the Google Chrome browser or insert a window variable.</li> </ul> <hr/> <p><b>Note:</b> This option is only available for the Google Chrome browser.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p></li> <li>• <b>New tab:</b> Opens the web page in a new tab. Select the tab from the list of active tabs in the Google Chrome browser or insert a window variable.</li> </ul> <hr/> <p><b>Note:</b> This option is only available for the Google Chrome browser.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern. <li>• <b>New window:</b> Opens the web page in a new window of a specific browser.</li> <p>Select the browser from the following options:</p> <ul style="list-style-type: none"> <li>• Default Browser <p>Ensure that Internet Explorer, Microsoft Edge or Google Chrome is set as the default browser.</p> <hr/> <p><b>Note:</b> If any browser that is not listed is set as the default browser for the device, the bot might encounter an error.</p> <hr/> <ul style="list-style-type: none"> <li>• Google Chrome</li> <li>• Internet Explorer</li> <li>• Microsoft Edge</li> <li>• Mozilla Firefox</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• Enter the link to the web page to open.</li> <li>• <b>Optional:</b> In the <b>Time out after</b> field, enter the number of seconds</li> </ul> </p>

Action	Description
Run JavaScript	<p>Executes JavaScript in a web page.</p> <hr/> <p><b>Note:</b> This action is only available for the Google Chrome browser.</p> <hr/> <ul style="list-style-type: none"> <li>Select the browser tab from the list of active tabs in the Google Chrome browser or insert a window type variable.</li> </ul> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> <ul style="list-style-type: none"> <li>Choose one of the following options: <ul style="list-style-type: none"> <li>In the <b>Import existing file</b> option, select an existing JavaScript file.</li> </ul> <hr/> <p><b>Note:</b> If you are uploading a script from a file on your desktop, the file and any dependencies must be in a standalone folder. When you select a file for upload, all files and folders at the same folder level are uploaded.</p> <hr/> <ul style="list-style-type: none"> <li>In the <b>Manual input</b> option, enter the JavaScript.</li> </ul> </li> <li><b>Optional:</b> In the <b>Time out after</b> field, enter the number of seconds the bot must wait for the browser window or tab to close before the bot fails.</li> </ul> <hr/> <p><b>Recommended:</b> Enter a timeout value of at least 9 seconds.</p> <hr/> <ul style="list-style-type: none"> <li><b>Optional:</b> Select a variable to hold the action output. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>

## Using Find broken links action

The **Find broken links** action enables you to find links that are not working on a specific page or an entire website. The action stores the output to a CSV file and allows you to specify the encoding you to use to store the output.

Follow these steps to find broken links:

- In the **Actions** palette, double-click or drag the **Find broken links** action from the **Browser** package.
- In the **Page or URL** field, enter the URL of the page or website.
- In the **Scope** option, choose either **check only this page** or **check the whole site**.
- In the **Save list to location** field, specify the location of the CSV file.
- Select the **Append to already existing csv file** check box if you want to append the data to an existing CSV file.

6. Select an option from the **Encoding** list to specify the encoding that you want to apply on the file.
  - **ANSI**
  - **Unicode**
  - **UTF-8**

7. In the **Number of parallel threads** field, enter the number of parallel threads you want to run simultaneously.

Parallel threads means multiple processes running simultaneously to perform the same task which results in faster execution. Higher the number of parallel threads faster the execution of a task execution. For example, if 10 threads complete a task in two minutes, 20 threads complete a task in one minute.

---

**Note:** The maximum value you can provide in the field is 99.

---

8. In the **Time out** field, specify the maximum time the system must wait to receive a response from each URL link.
9. Click **Save**.

## Clipboard package

The Clipboard package contains actions that enable you to automate using the Windows clipboard. Use the actions to copy a string value to the clipboard, copy the clipboard value to a string variable, and clear the clipboard.

### Actions in the Clipboard package

The Clipboard package includes the following actions:

Action	Description
Clear	Clears the clipboard. This action will remove any value that is stored in the clipboard.
Copy from	Retrieves the values stored in the clipboard and stores it in the string variable that you select from the <b>Assign the output to variable</b> list. This action enables you to pass the value from the clipboard to other actions.
Copy to	Stores values in the clipboard. You can either enter the value or specify the string variable that contains the value in the <b>Value</b> field.

## Comment package

Use the **Comment** package to insert a user-specified comment into your bot logic.

### Action in the Comment package

The **Comment** package includes the following action:

Action	Description
Comment	<p>Inserts a comment.</p> <hr/> <p><b>Note:</b> A comment is saved and displayed as a single line. A comment with multiple lines is displayed as a single line, followed by an ellipsis when the comment is saved. Comments are ignored when the bot runs.</p> <hr/>

## CSV/TXT package

The **CSV/TXT** package contains actions that enable you to open a CSV or text file, read data from that file, and assign the data to a Table variable. This package supports files encoded in ANSI, Unicode, UTF-8, or Windows-1251, and can process up to one million records.

Perform the following actions within the **CSV/TXT** package as part of using the set of available actions:

1. Open the file to be used in the automation. See [Using the Open action for CSV/TXT file](#).

---

**Note:** For files containing large data sets, use actions from the Database package to automate create, read, and update operations. See [Using Connect action for database](#).

---

2. Use the **Read** action to retrieve values from a CSV or TXT file and store them in a Table variable. See [Using Read action](#).

To retrieve values row by row, use the **For each row in CSV/TXT** iterator in the Loop action to read values from each row in the file and assign it to a record variable. See [Using the For each row in CSV/TXT iterator](#).

---

**Note:** The **Read** action and **For each row in CSV/TXT** iterator only support CSV/TXT files that conform to the RFC 4180 standard. For more information about the standard, see [Common format and MIME type for CSV files](#).

---

3. After you have automated the CSV/TXT-related tasks, close the file using the **Close** action. Enter the session name that was used to open the file with the **Open** action.

### Related reference

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

#### [Your variables \(user-defined\)](#)

Users and some actions create user-defined variables to temporarily hold values. Use this kind of variable to input values into an action (window title, login credential, or file path) or to accept the output of an action (values read from a file or a Boolean return).

### Using the Open action for CSV/TXT file

This action enables you to specify the delimiter used in the file, whether to trim the spaces, and the encoding applied on the file.

---

**Note:** If there is a double quotation mark (") in the last element of the last line of the CSV/TXT file, at runtime the bot will encounter an error.

---

To open a CSV or text file, do the following:

1. Double-click or drag the **Open** action from the **CSV/TXT** package in the **Actions** palette.
2. Select any of the following options to specify the location of the CSV or text file to open:

- **Control Room file:** Enables you to open a file from the Control Room.
  - **Desktop file:** Enables you to open a file from the device. This field also accepts the file path input as a string variable or global value.
  - **Variable:** Enables you to open a file by specifying a file variable.
3. Select the **Contains header** check box if the file contains a header row and you want to retrieve values from that row.
  4. Select any of the following options to specify the **Delimiter** used in the file:
    - **Comma**
    - **Tab**
    - **Regional list separator:** Enables you to specify the delimiter as configured in the regional settings of the Windows operating system. If the **List Separator** in the Windows regional settings is modified, then the CSV file should also contain that character as a delimiter.
    - **Newline**
    - **Other:** Enables you to specify a delimiter other than the options listed above.
  5. Select the **Trim leading** and **Trim trailing** check boxes to remove the leading and trailing spaces from the data extracted from the CSV/TXT file
  6. Select an option from the **Encoding** list to specify the encoding that is applied on the file. Data from the CSV/TXT file will be retrieved based on the selected encoding option even if the input file has a different encoding.
    - **ANSI:** Used to encode Latin alphabet.
    - **UTF8:** Can encode all possible characters.
    - **UNICODE**
    - **Win1251:** used to encode languages that use the Cyrillic script, including Bulgarian, Russian, and Serbian.
    - **UTF-16LE:** ignores the byte order mark (BOM) Unicode character at the beginning of file.
    - **Default:** identifies file encoding. This option supports UTF-8, UTF-16LE, and UTF-16BE file encoding.

---

**Note:** Shift-JIS files must use **ANSI** as encoding to read text file content.

---

7. Click **Save**.

Use the **Read** action to retrieve the data from CSV/TXT file and assign them to a table variable. You can use the loop action to retrieve each row of data from the file or table variable and assign them to the record variable for further operations.

- [Using Read action](#)
- [Using the For each row in CSV/TXT iterator](#)

## Using Read action

Use the **Read** action to retrieve values from a CSV or TXT file and insert them into a Table variable in order to perform operations with the data values.

---

**Note:** The **Read** action only support CSV/TXT files that conform to the RFC 4180 standard. For more information about the standard, see [Common format and MIME type for CSV files](#).

---

To retrieve values from a CSV/TXT file, do the following:

1. Double-click or drag the **Read** action from the **CSV/TXT** node in the **Actions** palette.
2. Enter the name of the session that you have used to open the CSV or text file in the **Open** action.

**3.** Select a Table variable from the **Assign value to the variable** list.

Create a variable if it does not already exist. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.

Perform operations with the values in the Table variable using the [Data Table package](#).

## Data Table package

The Data Table package contains actions that enable you to perform various operations on the values of table variables. Use these actions to join or merge content, search for specific values, insert rows and columns, remove duplicate rows, and write values to a file.

### Actions in the Data Table package

The Data Table package includes the following actions:

**Note:** If you built a bot using actions from the Data Table package from Build 5322 or earlier, the actions will be missing when you open the bot with the default package version. You must reinsert the actions and repopulate the fields.

Action	Description
Assign	<p>Assigns values to a table variable.</p> <p>You can use this action to manually enter the table data.</p> <ul style="list-style-type: none"> <li>Select whether to create a table with or without values. <ul style="list-style-type: none"> <li>If you select to create a table with values, either manually enter the values or select a source table variable.</li> <li>If you select to create a table without values, specify the number of rows and columns.</li> </ul> </li> <li>Select a table variable to hold the output. You can either select the source table variable to overwrite the values, or select a different table variable.</li> </ul>

Action	Description
Change column type	<p>Changes the data type of a column.</p> <ul style="list-style-type: none"> <li>• Select the Data table name from the drop-down list.</li> <li>• Select whether to specify the column by <b>Name</b> or <b>Index</b>.</li> <li>• If you select to specify by name, enter the column name.</li> <li>• If you select to specify by index, enter the column index. For example, to set a value to the first column, enter 0.</li> <li>• Select the new column data type from the drop-down list to to <b>Number, Boolean, String, or Datetime</b>. <ul style="list-style-type: none"> <li>• If you select <b>Datetime</b>, you can format the values by selecting a predefined format or specifying a custom format.</li> <li>• To specify the format applied on the input data table variable, select an option either from the predefined format list or enter the value in a custom format.</li> </ul> </li> <li>• Select a table variable to include the output.</li> </ul> <p>You can either select the source table variable to overwrite the values or select a different table variable.</p>
Clear content	<p>Clears the contents of the specified table variable.</p> <p>This action clears the content until the execution of the bot is completed. After the bot execution is completed, the original values of the table variables are restored.</p> <p>The action enables you to reuse an existing table variable to store values that are used only during the bot execution.</p> <hr/> <p><b>Note:</b> The data type of the values must be same as the data type of the columns in the table variable.</p> <hr/>
Delete column	<p>Deletes a specific column.</p> <ul style="list-style-type: none"> <li>• Select the Table variable name from the drop-down list.</li> <li>• Specify the column name or column index to delete.</li> </ul> <hr/> <p><b>Note:</b> The index count starts from 0.</p> <hr/>
Delete row	<p>Deletes a specific row.</p> <hr/> <p><b>Note:</b> If the data table values were read from an Excel sheet, and you selected the <b>Sheet contains a header</b> option in the <b>Open</b> action, you cannot delete cells from the first row.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the Table variable name from the drop-down list.</li> <li>• Specify the row name or row index to delete.</li> </ul> <hr/> <p><b>Note:</b> The index count starts from 0.</p> <hr/>

Action	Description
Get number of columns	Retrieves the number of columns and assigns it to a Number variable. You have the option to select the non-empty columns or include all the columns in the selection.
Get number of rows	Retrieves the number of rows and assigns it to a Number variable. You have the option to select the non-empty rows or include all the rows in the selection.
Insert column	<p>Inserts a column from one table to another table.</p> <p>For destination table:</p> <ul style="list-style-type: none"> <li>• Select the destination table variable form the <b>Enter into data table</b> list.</li> <li>• Select where to insert the column: first index, last index, or enter the column index number.</li> </ul> <hr/> <p><b>Note:</b> The index count starts from 0.</p> <hr/> <p>For source table:</p> <ul style="list-style-type: none"> <li>• Select the source table variable from the <b>Insert from table</b> list.</li> <li>• Enter the name or index number of the column to insert.</li> </ul>
Insert row	<p>Inserts a row into the table.</p> <ul style="list-style-type: none"> <li>• Select the Table variable name from the drop-down list.</li> <li>• Select where to insert the row: first index, last index, or enter the row index number.</li> </ul> <hr/> <p><b>Note:</b> The index count starts from 0.</p> <hr/>
Join	<p>See <a href="#">Using Join action</a>.</p> <p>Use the <a href="#">Join type output examples</a> to help you decide whether to use the <b>Join</b> or <b>Merge</b> action.</p> <hr/> <p><b>Note:</b> If you built a bot using this action from package version 2.0.0-20200624-042148 or earlier, the action will be missing when you open the bot with the default package version. You must reinsert the action and repopulate the fields.</p> <hr/>
Merge	<p>See <a href="#">Using the Merge action</a>.</p> <p>Use the <a href="#">Merge output example</a> to help you decide whether to use the <b>Join</b> or <b>Merge</b> action.</p> <hr/> <p><b>Note:</b> If you built a bot using this action from package version 2.0.0-20200624-042148 or earlier, the action will be missing when you open the bot with the default package version. You must reinsert the action and repopulate the fields.</p> <hr/>
Remove duplicate rows	Deletes duplicate rows (if any exist). Select the Table variable name from the drop-down list.

Action	Description
Search for a value	<p>Searches for a specific value in the table, returns the row and column numbers in which the value occurs, and assigns the row and column numbers to a List variable. For example, if you search for the value <code>abc</code> that is available at the fourth row and third column of a table variable, the action returns <code>3, 2</code> as output. As the index number for the row and column starts with zero, the values in the output indicates the fourth row and third column.</p> <ul style="list-style-type: none"> <li>• Select the Table variable name from the drop-down list.</li> <li>• Enter the value to search for.</li> <li>• Select <b>Match case</b> to ensure the case matches the value searched.</li> </ul>
Set cell value	<p>Updates the value of a specific cell.</p> <ul style="list-style-type: none"> <li>• Select the Table variable name from the drop-down list.</li> <li>• Enter the row index. For example, to set a value to the first row, enter <code>0</code>.</li> <li>• Select whether to specify the column by <b>Name</b> or <b>Index</b>. <ul style="list-style-type: none"> <li>• If you select to specify by name, enter the column name. Capitalization is not important.</li> <li>• If you select to specify by index, enter the column index. For example, to set a value to the first column, enter <code>0</code>.</li> </ul> </li> <li>• Enter the value to set.</li> </ul>
Sort	<p>Sorts the table data by a column.</p> <p>This action enables you to sort the data by column data format (string, number, datetime, or Boolean).</p> <ul style="list-style-type: none"> <li>• Select the Table variable name from the drop-down list.</li> <li>• Specify the column name or column index to sort by.</li> <li>• Select the order in which to sort: <b>ascending</b> or <b>descending</b>.</li> </ul> <hr/> <p><b>Note:</b> If you built a bot using this action from package version 2.0.0-20200624-042148 or earlier, the action will be missing when you open the bot with the default package version. You must reinsert the action and repopulate the fields.</p> <hr/>
Write to file	See <a href="#">Using Write to file action</a> .

**Example:** [Example of extracting data from a web table](#)

## Using Join action

Use the **Join** action to combine content from two table variables. This action enables you to combine content based on the shared values of a specific column in the tables and store the content into a third Table variable or one of the two source tables.

To join the content from two Table variables, do the following:

1. Double-click or drag **Data table** > **Join**.
2. Select the first Table variable to use from the **Enter first data table name** list.

3. Enter the name of the column from the first Table variable that contains the data to join.
4. Select the second Table variable to use from the **Enter second data table name** list.
5. Enter the name of the column from the second Table variable that contains the data to join.
6. Select an option to specify the type of join. For more information, see [Join type output examples](#).
  - **inner join:** Returns only the records that have matching values in the selected columns in both tables.
  - **left outer join:** Returns all records from the first table, and the matched records from the second table.
  - **right outer join:** Returns all records from the second table, and the matched records from the first table.
  - **full outer join:** Returns all records when there is a match in either left or right table.
7. Select the table variable to store the combined values from the **Enter name of data table in which to join** list.
8. In the **Assign value to variable** list, select a string variable.

#### *Join type output examples*

Select a join type option based on your desired output. Use the examples below to guide your selection.

#### Inner join

Returns only the records that have matching values in the selected columns in both tables.

For example, if you have a table of employees and their departments, and a table of employees and their pay rates, this option will return a table of the employees that exist in both tables, and their departments and pay rates.

**Table 1: Employees and Departments**

Employee	Department
John	101
Jill	102
Mike	103
Betty	104
Cindy	105

**Table 2: Employees and Pay rates**

Employee	Pay rate
John	50
Betty	50
Mike	40
Jill	35
Dan	45

**Table 3: Employees, Departments, and Pay rates**

Employee	Department	Pay rate
John	101	50
Jill	102	35
Mike	103	40
Betty	104	50

### Left outer join

Returns all records from the first table, and the matched records from the second table.

Using the example Tables 1 and 2, this option returns the following table:

**Table 3: Employees, Departments, and Pay rates**

Employee	Department	Pay rate
John	101	50
Jill	102	35
Mike	103	40
Betty	104	50
Cindy	105	

### Right outer join

Returns all records from the second table, and the matched records from the first table.

This option returns the following table:

**Table 3: Employees, Departments, and Pay rates**

Employee	Department	Pay rate
John	101	50
Betty	104	50
Mike	103	40
Jill	102	35
Dan		45

### Full outer join

Returns all records when there is a match in either left or right table.

This option returns the following table:

**Table 3: Employees, Departments, and Pay rates**

Employee	Department	Pay rate
John	101	50
Jill	102	35
Mike	103	40
Betty	104	50
Cindy	105	
Dan		45

## Using the Merge action

Use the **Merge** action to combine the contents of two tables when both source tables contain identical column headers. To combine tables that contain different column headers, use the **Join** action.

If one of the tables contains non-identical headers, then the merged table will contain the columns from the first source table with data from the second source table under the identical column headers, followed by the non-identical columns and data from the second source table.

To merge the content, perform these steps:

1. Double-click or drag **Data table** > **Merge**.
2. Select the first table variable you want to use from the **Enter first data table name** list.
3. Select the second table variable you want to use from the **Enter second data table name** list.
4. Select the table variable that you want to use to store the merged data from the **Enter name of data table in which to merge** list.
5. Click **Save**.

For more information, see [Merge output example](#).

### *Merge output example*

The **Merge** action combines data from two tables with identical column headers, and stores the merged content in a third table or one of the two source tables. These examples demonstrate the output of two tables with identical column headers and the output of two tables with differing column headers.

## Output of tables with identical column headers

For example, if you have a table of employees hired in September and a table of employees that were hired in October, this option will return a table of all the employees, with the October hires merged below the September hires.

**Table 1: Employees hired in September**

Employee	Department	Pay rate
John	101	50
Jill	102	35

**Table 2: Employees hired in October**

Employee	Department	Pay rate
Mike	103	40

Employee	Department	Pay rate
Betty	104	50

**Table 3: All employees**

**Note:** The column headers in the output table are always lowercase.

employee	department	pay rate
John	101	50
Jill	102	35
Mike	103	40
Betty	104	50

### Output of tables with differing column headers

In this example, the second table has a different column header. As a result, the third table contains the columns from the first source table with data from the second source table under the identical column headers, followed by the non-identical columns and data from the second source table.

**Table 1: Employees hired in September**

Employee	Department	Pay rate
John	101	50
Jill	102	35

**Table 2: Employees hired in October**

Employee	Department	Salary
Mike	103	40
Betty	104	50

**Table 3: All employees**

employee	department	pay rate	salary
John	101	50	
Jill	102	35	
Mike	103		40
Betty	104		50

## Using Write to file action

Use the **Write to file** action to write the data from a Table type variable to a CSV or TXT file.

To write data into a file, do the following:

1. Double-click or drag **Data table** > **Write to file**.
2. Select the Table variable that contains the data to write from the **Data table name** list.
3. Specify the location of the file in which to write the data in the **Enter file name** field.
4. Select the **Create folders/files if it doesn't exist** check box to create the file or folder that you specified in the **Enter file name** field.
5. Select an option to specify what to do when writing data in an existing file:
  - **Append to the existing file**
  - **Override existing file**
6. Select an option from the **Row delimiter** list to specify the delimiter to use for rows.
7. Select an option from the **Column delimiter** list to specify the delimiter to use for columns.
8. Select an option from the **Encoding** list to specify the encoding that you want to apply on the file.

The default encoding is set to ANSI

- **ANSI**
  - **UTF-8**
  - **Unicode**
  - **Win1251**
9. In the **Assign value to variable** list, select a string variable.

## Database package

Databases support internal operations of an enterprise by storing a variety of data, such as sales transactions, product catalogs, inventories, and customer profiles. Use the Database package to connect to a database, begin a transaction, and manipulate the stored data by retrieving, inserting, updating, deleting, and exporting it to a CSV file.

### Before you start

Perform the following actions within the Database package as part of using the set of available actions:

1. Establish a connection with the database server using the **Connect** action.  
See [Using Connect action for database](#).
2. Choose from the following:
  - Use the **Read from** action to retrieve records from the database. [Using the Read from action](#)
  - If you are automating a task that involves making changes to the database, insert the **Begin database transaction** action, followed by the actions that automate the changes.  
This action ensures that all records are updated or deleted in their entirety, and prevents accidental updates or deletions of incomplete data if the bot encounters an error during run time.
3. If you used the **Begin database transaction** action in this session, insert the **End database transaction** to commit the changes.

- Every set of database actions ends with the **Disconnect** action to terminate the connection to the database server.

## Actions in the Database package

The Database package includes the following actions:

Action	Description
Begin database transaction	<p>Starts a database transaction.</p> <p>The actions that you insert between the <b>Begin database transaction</b> and <b>End database transaction</b> actions are treated as a single unit. The bot must run all of the actions successfully in order to update the database. This prevents a partial entry in the event that one of the actions fail.</p> <p>For example, in double-entry accounting every debit requires the recording of a credit. If a company receives \$5000 of products, the accountant must debit \$5000 to inventory and credit \$5000 to accounts payable.</p> <p>Insert the actions that record these entries between the <b>Begin database transaction</b> and <b>End database transaction</b> actions to ensure that either both entries are recorded or neither is recorded in the database.</p> <p>In the <b>Session name</b> field, enter the name of the session you used to connect to the database server in the <b>Connect</b> action.</p>
Connect	<p>See <a href="#">Using Connect action for database</a>.</p> <p>The Snowflake database using the ODBC driver is supported.</p>
Disconnect	<p>Disconnects from a database. In the <b>Session name</b> field, enter the name of the session you used to connect to the database server in the <b>Connect</b> action.</p> <p>The Snowflake database using the ODBC driver is supported.</p>
End database transaction	<p>Commits all the database operations that were performed with the actions that followed the <b>Begin database transaction</b> action, under the condition that the bot successfully ran those actions. In the <b>Session name</b> field, enter the name of the session you used to connect to the database server in the <b>Connect</b> action.</p>
Export to data table	<p>See <a href="#">Using the Export to data table action</a>.</p> <p>The Snowflake database using the ODBC driver is supported.</p>

Action	Description
Insert/Update/Delete	<p>Executes an INSERT, UPDATE, or DELETE statement from the database.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the name of the session you used to connect to the database server in the <b>Connect</b> action.</li> <li>In the <b>Statement</b> field, enter the SQL statement to insert, update, or delete the records. <ul style="list-style-type: none"> <li>Use an INSERT statement to create new records in a table: <pre>INSERT INTO table_name (column1, column2, column3, ...) VALUES (value1, value2, value3, ...);</pre> </li> <li>Use an UPDATE statement to modify a record: <pre>UPDATE table_name SET column1 = value1, column2 = value2, ... WHERE condition;</pre> </li> <li>Use a DELETE statement to remove a record: <pre>DELETE FROM table_name WHERE condition;</pre> </li> </ul> </li> <li>In the <b>Timeout for the query in seconds</b> field, specify the time within which the statement execution should stop, even if the execution is not completed.</li> </ul> <p>The Snowflake database using the ODBC driver is supported.</p>

Action	Description
Manage stored procedure	<p>Creates, updates, and deletes a stored procedure within the specified database. A stored procedure is SQL code saved to the database, enabling you to run it repeatedly.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the name of the session you used to connect to the database server in the <b>Connect</b> action.</li> <li>In the <b>Enter full command</b> field, enter the command to create, update, or delete the stored procedure. You can specify input and output parameters for the command; you provide values or variables holding the values in the <b>Run stored procedure</b> action.</li> </ul> <hr/> <p><b>Recommended:</b> Declare a delimiter and use it to close the SQL statement.</p> <hr/> <p><b>MySQL example:</b> In this example, the bot checks if there is a procedure in the database named <code>sum_of_two</code>. If not, the bot creates a procedure that accepts two input parameters (num1 and num2), adds them together, and produces the sum as the output parameter:</p> <pre> DROP PROCEDURE IF EXISTS sum_of_two; DELIMITER \$\$ CREATE PROCEDURE sum_of_two(IN num1 INT, IN num2 INT, OUT sum INT) BEGIN SET sum := num1 + num2; END \$\$ </pre> <ul style="list-style-type: none"> <li>In the <b>Timeout for the query in seconds</b> field, specify the time within which the statement execution should stop, even if the execution is not completed.</li> </ul>
Read from	<p>See <a href="#">Using the Read from action</a>.</p> <p>The Snowflake database using the ODBC driver is supported.</p>
Run stored procedure	See <a href="#">Using the Run stored procedure action</a> .

### Related reference

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

#### [Variables overview](#)

Automation 360 offers a variety of variables, each designed to hold specific types of data and is intended for specific use. Use the topics below to learn more about each variable and how to use them.

## Using Connect action for database

Use the **Connect** action to establish a connection with the database server that you want to use to automate database-related tasks. This action supports Microsoft Access, Microsoft SQL Server, MySQL,

Oracle, PostgreSQL Server, and SQLite database servers, as well as the use of CSV, Microsoft Excel, and TXT files as databases.

Specify the details of a database server and associate it with a session name. Use the session name provided in this action in the other actions so that you do not have to provide the details of the database server in those actions.

To establish a connection with a database server, follow these steps:

1. Double-click or drag the **Connect** action from the Database package in the **Actions** palette.
2. Enter a unique name for the session in the **Session name** field.
3. Select the **Default** or **User defined** connection option.
  - If you select the **Default** option, you can directly enter the connection string for any of the supported database types.

If you have configured your database and shared repository in the secondary site, use the JDBC connection to connect to the replica database. For example, `jdbc:sqlserver://AGL-ADDRESS:1433;databaseName=DB_NAME;user=username;password=password;applicationIntent`

You can establish a connection with the Snowflake database using ODBC drivers. For more information about downloading the ODBC driver, see [Snowflake using ODBC Driver](#)

You can enter the connection string to connect to the database. For example, `Driver={SnowflakeDSIIDriver};Server={account}.aws.snowflakecomputing.com;Database=D`

Use this option to connect to an Excel, CSV, or TXT file. See [Connection Strings by database type](#).

---

**Note:** To use an Excel, CSV, or TXT file as a database, you must first install a 32-bit ODBC driver on your device. ODBC drivers do not support the delete operation.

---

To ensure a more secure automation, use a Credential Vault variable for the connection string.

- If you select the **User defined** option, select the database type from the available options and complete the following fields based on the selection:

Database Type	Options
Microsoft SQL Server, PostgreSQL Server	<ul style="list-style-type: none"> <li>• <b>Server name:</b> Enter the name of the database server you want to connect to.</li> <li>• <b>Database name:</b> Enter the database name.</li> <li>• <b>Username:</b> Enter the username you want to use to access the database server. To ensure a secure user name, select a Credential Vault variable. Otherwise, enter a value.</li> <li>• <b>Password:</b> Enter the password for the username you have provided. To ensure a secure password, select a Credential Vault variable. Otherwise, enter a value.</li> <li>• <b>Instance name:</b> Enter a name for this connection instance.</li> </ul> <p><a href="#">Connect to Microsoft SQL Server with Windows authentication</a></p>
MySQL	Enter the same options as in the Microsoft SQL Server database type. Also, enter the port number. The default port number is 3306.

Database Type	Options
Microsoft Access, SQLite	Select the database file path from: <ul style="list-style-type: none"> <li>• <b>My bots</b> folder</li> <li>• local device</li> <li>• existing file variable</li> </ul>
Oracle	<ul style="list-style-type: none"> <li>• <b>Server name:</b> Enter the name of the Oracle server you want to connect to.</li> <li>• Select an option to specify the Oracle instance you want to use:               <ul style="list-style-type: none"> <li>• <b>System id (SID):</b> Enter the system ID.</li> <li>• <b>Service name:</b> Enter the service name.</li> </ul> </li> <li>• <b>Username:</b> Enter the username you want to use to access the Oracle server. To ensure a secure user name, select a Credential Vault variable. Otherwise, enter a value.</li> <li>• <b>Password:</b> Enter the password for the username you have provided. To ensure a secure password, select a Credential Vault variable. Otherwise, enter a value.</li> <li>• <b>Port:</b> Enter the port number. The default port number is 1521.</li> </ul>

---

**Note:** The Database package does not include the JDBC driver for MySQL and Oracle. You can provide your jar file version for a specific database by downloading it from the appropriate resources and uploading the jar file in your Control Room using the **User defined** connection option.

---

4. Select a driver file from the **My bots** folder, the local device, or a file variable.
5. Click **Save**.

Choose from the following:

- Use the **Read from** action to retrieve records from the database.  
*Using the Read from action*
- If you are automating a task that involves making changes to the database, insert the **Begin database transaction** action.

This action ensures that all records are updated or deleted in their entirety, and prevents accidental updates or deletions of incomplete data if the bot encounters an error during run time.

*Database package*

*Connect to Microsoft SQL Server with Windows authentication*

Configure your device and the Connect action from the Database package to automate connecting to a Microsoft SQL Server with Windows NT authentication.

This task is applicable only for releases prior to Build 9642. Starting from Build 9642, you no longer have to add DLL files manually to connect to the Microsoft SQL Server.

To use Windows NT authentication for connecting to the Microsoft SQL Server, follow these steps:

1. Download the JDBC driver for Microsoft SQL Server.

*Download the JDBC Driver from Microsoft*

2. In the unzipped folder, locate the .dll file in the `auth\x64\` file path.
3. If the .dll file has a different name, rename the file to `sqljdbc_auth.dll`.
4. Copy the `sqljdbc_auth.dll` file to the following file paths on the Bot Creator or Bot Runner devices:

- `C:\Users\User Name\AppData\Local\Programs\Automation Anywhere\Bot Agent\jre\bin`
- `C:\Program Files\Automation Anywhere\Bot Agent\jre\bin`

This enables Windows authentication because the JDBC driver cannot perform the authentication by default.

5. Select the **Default** connection option.
6. Enter the connection string: `jdbc:sqlserver://localhost;databaseName=Test;integratedSecurity=true;`
7. Click **Save**.

Choose from the following:

- Use the **Read from** action to retrieve records from the database.

*Using the Read from action*

- If you are automating a task that involves making changes to the database, insert the **Begin database transaction** action.

This action ensures that all records are updated or deleted in their entirety, and prevents accidental updates or deletions of incomplete data if the bot encounters an error during run time.

*Database package*

## Using the Run stored procedure action

Stored procedures are a set of SQL statements that are created and stored in the database. These SQL statements might be complex and have to run multiple times. Use the **Run stored procedure** action to execute existing stored procedures.

---

**Note:** This action does not support Microsoft Access or SQLite database types.

---

To automate the task of executing a stored procedure, follow these steps:

1. Enter the name of the session you used to connect to the database server in the **Connect** action. You do not have to provide the details of the database server here because you have already associated those details with the session name when using the **Connect** action.
2. Enter the name of the stored procedure.

3. Optional: Click **Add parameter** to provide an input parameter or configure an output parameter.  
Select from the following parameter options:

Option	Steps
<b>Input</b>	<p>Parameter is passed from the bot to the stored procedure.</p> <ul style="list-style-type: none"> <li>• <b>Name:</b> Enter the name of the parameter from the stored procedure.</li> <li>• <b>Value (optional):</b> Enter a value or select a variable.</li> <li>• <b>Type:</b> Select the data type from the following options <ul style="list-style-type: none"> <li>• <b>BIGINT</b> (number)</li> <li>• <b>BINARY</b> (Boolean)</li> <li>• <b>BIT</b> (number)</li> <li>• <b>CHAR</b> (string)</li> <li>• <b>DATE</b> (date time) Supported format yyyy-mm-dd</li> <li>• <b>DECIMAL</b> (number)</li> <li>• <b>DOUBLE</b> (number) Default choice for decimal values.</li> <li>• <b>FLOAT</b> (number)</li> <li>• <b>INTEGER</b> (number) Uses 4 bytes to store an integer with a value from -2,147,483,648 to 2,147,483,647</li> <li>• <b>LONGVARBINARY</b> (Boolean)</li> <li>• <b>LONGVARCHAR</b> (string)</li> <li>• <b>NUMERIC</b> (number)</li> <li>• <b>REAL</b> (number)</li> <li>• <b>SMALLINT</b> (number) Uses 2 bytes to store an integer with a value from -32,768 to 32,767</li> <li>• <b>TIME</b> (date time) Supported format hh:mm:ss</li> <li>• <b>TIMESTAMP</b> (date time) Supported format yyyy-mm-dd hh:mm:ss.f, where f is fractional seconds</li> <li>• <b>TINYINT</b> (number) Uses 1 byte to store an integer with a value from 0 to 255</li> <li>• <b>VARBINARY</b> (Boolean)</li> <li>• <b>VARCHAR</b> (string)</li> </ul> </li> </ul> <p>For example, if running the example function from the <b>Manage stored procedure</b> action, configure the following two input parameters and values for the <code>sum_of_two</code> function to add:</p> <ul style="list-style-type: none"> <li>• Parameter 1: num1, 5, TINYINT</li> <li>• Parameter 2: num2, 10, TINYINT</li> </ul>

Option	Steps
<b>Output</b>	<p>Parameter is passed from the stored procedure to the bot.</p> <ul style="list-style-type: none"> <li>• <b>Name:</b> Enter the name of the parameter from the stored procedure.</li> <li>• <b>Type:</b> Select the data type from the following options <ul style="list-style-type: none"> <li>• <b>BIGINT</b> (number)</li> <li>• <b>BINARY</b> (Boolean)</li> <li>• <b>BIT</b> (number)</li> <li>• <b>CHAR</b> (string)</li> <li>• <b>DATE</b> (date time)</li> </ul> <p>Supported format yyyy-mm-dd</p> <li>• <b>DECIMAL</b> (number)</li> <li>• <b>DOUBLE</b> (number)</li> <p>Default choice for decimal values.</p> <li>• <b>FLOAT</b> (number)</li> <li>• <b>INTEGER</b> (number)</li> <p>Uses 4 bytes to store an integer with a value from -2,147,483,648 to 2,147,483,647</p> <li>• <b>LONGVARBINARY</b> (Boolean)</li> <li>• <b>LONGVARCHAR</b> (string)</li> <li>• <b>NUMERIC</b> (number)</li> <li>• <b>REAL</b> (number)</li> <li>• <b>SMALLINT</b> (number)</li> <p>Uses 2 bytes to store an integer with a value from -32,768 to 32,767</p> <li>• <b>TIME</b> (date time)</li> <p>Supported format hh:mm:ss</p> <li>• <b>TIMESTAMP</b> (date time)</li> <p>Supported format yyyy-mm-dd hh:mm:ss.f, where f is fractional seconds</p> <li>• <b>TINYINT</b> (number)</li> <p>Uses 1 byte to store an integer with a value from 0 to 255</p> <li>• <b>VARBINARY</b> (Boolean)</li> <li>• <b>VARCHAR</b> (string)</li> </li></ul> <p>When the bot runs, the action converts the database data type to an Automation 360-supported data type.</p> <p>For example, if running the example <code>sum_of_two</code> function from the <b>Manage stored procedure</b> action, configure the output parameter: <code>sum, TINYINT</code>.</p>

Option	Steps
<b>InputOutput</b>	<p>Parameter can be used for both input and output.</p> <ul style="list-style-type: none"> <li>• <b>Name:</b> Enter the name of the parameter from the stored procedure.</li> <li>• <b>Value (optional):</b> Enter a value or select a variable.</li> <li>• <b>Type:</b> Select the data type from the following options <ul style="list-style-type: none"> <li>• <b>BIGINT</b> (number)</li> <li>• <b>BINARY</b> (Boolean)</li> <li>• <b>BIT</b> (number)</li> <li>• <b>CHAR</b> (string)</li> <li>• <b>DATE</b> (date time) Supported format yyyy-mm-dd</li> <li>• <b>DECIMAL</b> (number)</li> <li>• <b>DOUBLE</b> (number) Default choice for decimal values.</li> <li>• <b>FLOAT</b> (number)</li> <li>• <b>INTEGER</b> (number) Uses 4 bytes to store an integer with a value from -2,147,483,648 to 2,147,483,647</li> <li>• <b>LONGVARBINARY</b> (Boolean)</li> <li>• <b>LONGVARCHAR</b> (string)</li> <li>• <b>NUMERIC</b> (number)</li> <li>• <b>REAL</b> (number)</li> <li>• <b>SMALLINT</b> (number) Uses 2 bytes to store an integer with a value from -32,768 to 32,767</li> <li>• <b>TIME</b> (date time) Supported format hh:mm:ss</li> <li>• <b>TIMESTAMP</b> (date time) Supported format yyyy-mm-dd hh:mm:ss.f, where f is fractional seconds</li> <li>• <b>TINYINT</b> (number) Uses 1 byte to store an integer with a value from 0 to 255</li> <li>• <b>VARBINARY</b> (Boolean)</li> <li>• <b>VARCHAR</b> (string)</li> </ul> </li> </ul>

4. Enter the maximum number of records to retrieve.

You can limit the results of the execution.

5. Optional: Enter a timeout value.

When the specified time expires, the statement execution stops even if the execution is not completed.

6. Optional: Select the **Export data to CSV** option to save the retrieved data.

**Note:** The **Export data to CSV** option does not support Oracle Database or PostgreSQL Server database types. Use output parameters to retrieve values.

- Select the file path from the **My bots** folder, the local device, or an existing file variable.
- Select the CSV file encoding to be either **ANSI**, **UNICODE**, or **UTF8**.
- Select whether to export the CSV file with or without the column headers.

**With column headers**

CustomerName	City
Manny	Pittsburgh
Kate	Los Angeles
John	Boston

**Without column headers**

Manny	Pittsburgh
Kate	Los Angeles
John	Boston

- Specify whether to overwrite the file or append the data to the existing file if a CSV file with the same name exists.

7. Optional: Select a dictionary variable to hold the output if the stored procedure returns a value. Each output parameter name is a dictionary key which holds the corresponding parameter value. For example, if you assign the `sum_of_two` function output to `$Output$`, when the bot calls `$Output{sum}$`, the variable returns 15.

**Note:** If you do not know the output parameter name, use the default key `Output` appended by the parameter index number.

8. Click **Save**.

## Using the Export to data table action

Use the **Export to data table** action to retrieve records from the database and store the retrieved data in a table variable.

To automate the task of selecting and saving a set of records, follow these steps:

- Enter the name of the session you used to connect to the database server in the **Connect** action. You do not have to provide the details of the database server here because you have already associated those details with the session name when using the **Connect** action.

2. Enter the SELECT statement to specify the column and table names.

This field supports SQL syntax. For example, `SELECT CustomerName, City FROM Customers`

**Note:** CTE (Common Table Expression) is supported using `WITH` keyword in the SQL compliant databases such as Oracle and MySQL. For example,

```
WITH customers_in_usa AS (SELECT CustomerName, state FROM customers WHERE
country = 'USA')
SELECT cName FROM customers_in_usa WHERE state = 'LA' ORDER BY
CustomerName
```

3. Enter the maximum number of records to retrieve.
4. Optional: Enter a timeout value.  
When the specified time expires, the statement execution stops even if the execution is not completed.
5. In the **Assign to** option, select the table variable to store the retrieved data.
6. Click **Save**.

## Using the Read from action

Use the **Read from** action to retrieve records from the database and save the retrieved data in a CSV file. This action enables you to retrieve up to one million records from the database.

To automate the task of selecting and saving a set of records, follow these steps:

1. Enter the name of the session you used to connect to the database server in the **Connect** action.  
You do not have to provide the details of the database server here because you have already associated those details with the session name when using the **Connect** action.
2. Enter the SELECT statement to specify the column and table names.  
This field supports SQL syntax. For example, `SELECT CustomerName, City FROM Customers`

**Note:** CTE (Common Table Expression) is supported using `WITH` keyword in the SQL compliant databases such as Oracle and MySQL. For example,

```
WITH customers_in_usa AS (SELECT CustomerName, state FROM customers WHERE
country = 'USA')
SELECT cName FROM customers_in_usa WHERE state = 'LA' ORDER BY
CustomerName
```

3. Enter the maximum number of records to retrieve.
4. Optional: Enter a timeout value.  
When the specified time expires, the statement execution stops even if the execution is not completed.
5. Select the **Export data to CSV** option to save the retrieved data.
  - a) Select the file path from the **My bots** folder, the local device, or an existing file variable.
  - b) Select the CSV file encoding to be either **ANSI**, **UNICODE**, or **UTF8**.
  - c) Select whether to export the CSV file with or without the column headers.

### With column headers

CustomerName	City
Manny	Pittsburgh

CustomerName	City
Kate	Los Angeles
John	Boston

**Without column headers**

Manny	Pittsburgh
Kate	Los Angeles
John	Boston

- d) Specify whether to overwrite the file or append the data to the existing file if a CSV file with the same name exists.

**6. Click Save.****Example of migrating data from Excel to a database**

In this example, you build a bot to transfer values from an Excel spreadsheet to a database using actions from the Database, Excel advanced, and Loop packages.

Before you start building your bot, create the following:

- Excel spreadsheet with the following values:

John	Williams	jwilliams@gmail.com
Sam	Li	sam.li@xyz.org
Carl	Miller	carl@carlmillerllc.com

- Access database table named CustomerT with the following columns:
  - FirstName
  - LastName
  - Email

To migrate values from a spreadsheet to a table in a database, perform the following steps:

- Open a new bot:
  - From the Control Room, select **Bots > My bots**.
  - Click **Create new > Bot**.
  - In the **Create Task Bot** window, enter a bot name.
  - Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - Click **Create and edit**.
- Open the spreadsheet:
  - Double-click or drag the **Excel advanced > Open** action .
  - Click **Browse** to provide the file path.
  - Select the option to open the file in **Read-write**.

3. Connect to the database:
  - a) Double-click or drag the **Database > Connect** action.
  - b) Select the **User defined** connection mode.
  - c) Select the **Microsoft Access** database type.
  - d) Click **Browse** to provide the file path.
4. Insert the Excel values into the database, row by row:
  - a) Double-click or drag the **Loop** action.
  - b) Select the **Excel advanced > For each row in worksheet** iterator.
  - c) In the Assign the current value to this variable, create the record variable `rExcelCurrentRow`.
  - d) Drag the **Database > Insert/Update/Delete** action into the Loop container.
  - e) Enter the following SQL statement:
 

```
INSERT INTO CustomerT (FirstName,LastName,Email) values
('{$rExcelCurrentRow[0]}', '{$rExcelCurrentRow[1]}', '{$rExcelCurrentRow[2]}');
```
5. Disconnect from the database. Drag the **Database > Disconnect** action below the Loop container.
6. Close the spreadsheet. Double-click or drag **Excel advanced > Close Spreadsheet** action.
7. Click **Save**.

### Related reference

#### [Database package](#)

Databases support internal operations of an enterprise by storing a variety of data, such as sales transactions, product catalogs, inventories, and customer profiles. Use the Database package to connect to a database, begin a transaction, and manipulate the stored data by retrieving, inserting, updating, deleting, and exporting it to a CSV file.

#### [Excel advanced package](#)

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

## Datetime package

A datetime value consists of a date, time, and time zone. RPA Workspace stores datetime values in a Datetime variable. The **Datetime** package contains actions that enable you to perform various operations on datetime values. You can use these actions to manipulate and compare values in the Datetime variables.

### Actions in the Datetime package

The actions in the **Datetime** package accept a variable as an input and assign the output to a variable. These actions enable you to compare two Datetime values, add to or subtract from a Datetime value, and convert a Datetime value to a string value.

The **Datetime** package includes the following actions:

Action	Description
Add	See <a href="#">Using the Add action</a> .
Assign	See <a href="#">Using the Assign action</a> .
Is after	<p>Compares two Datetime variables and verifies if the value of the source variable is after the value available in the comparison variable, and stores the output to a Boolean variable.</p> <ul style="list-style-type: none"> <li>• Select the source variable from the <b>Source date and time variable</b> list, and select the variable you want to compare with from the <b>Date and time variable to be compared to</b> list.</li> <li>• Select the Datetime variable from the <b>Assign the output to a variable</b> list to specify the variable you want to use to assign the output.</li> </ul> <p>For example, if the value in the source variable is after the value in the comparison variable, the system stores <code>True</code> as the output in the Boolean variable. If the value in the source variable is not after the value in the comparison variable, the system stores <code>False</code> as the output in the Boolean variable.</p>
Is before	<p>Compares two Datetime variables and verifies if the value of source variable is before the value available in the comparison variable, and stores the output to a Boolean variable.</p> <ul style="list-style-type: none"> <li>• Select the source variable from the <b>Source date and time variable</b> list, and select the variable you want to compare with from the <b>Date and time variable to be compared to</b> list.</li> <li>• Select the Datetime variable from the <b>Assign the output to a variable</b> list to specify the variable you want to use to assign the output.</li> </ul> <p>For example, if the value in the source variable is before the value in the comparison variable, the system stores <code>True</code> as the output in the Boolean variable. If the value in the source variable is not before the value in the comparison variable, the system stores <code>False</code> as the output in the Boolean variable.</p>

Action	Description
Is equal	<p>Compares two Datetime variables and verifies if the value of the source variable is equal to the value available in the comparison variable, and stores the output to a Boolean variable.</p> <ul style="list-style-type: none"> <li>• Select the source variable from the <b>Source date and time variable</b> list, and select the variable you want to compare with from the <b>Date and time variable to be compared to</b> list.</li> <li>• Select the Datetime variable from the <b>Assign the output to a variable</b> list to specify the variable you want to use to assign the output.</li> </ul> <p>For example, if the value in the source variable is equal to the value in the comparison variable, the system stores <code>True</code> as the output in the Boolean variable. If the value in the source variable is not equal to the value in the comparison variable, the system stores <code>False</code> as the output in the Boolean variable.</p>
Subtract	See <a href="#">Using the Subtract action</a> .
To string	See <a href="#">Using the To string action</a> .

### Related reference

#### [Date time formats](#)

Various predefined formats are available in RPA Workspace that allow you to specify a custom format when you convert a datetime value to a string value.

## Using the Add action

Use the **Add** action to increase the value in the Datetime variable by a specified time value and unit. For example, you can use this action to increase the Datetime variable value by three hours or by three days.

To add a value to a Datetime variable, do the following:

1. Double-click or drag the **Add** action from the **Datetime** node in the **Actions** palette.
2. Select an option from the **Source date and time variable** list to specify the variable that contains the value to which you want to add the time unit.
3. Enter the value you want to add in the **Time value to add** field.

4. Select an option from the **Time unit to add** list to specify the time unit you want to add.  
Choose from the following time unit options:

- Milliseconds
- Seconds
- Minutes
- Hours
- Days
- Weeks
- Months
- Years

---

**Note:** This action accounts for leap years. For example, if the action adds 28 days to February 1, 2020, the action output is February 29, 2020. Whereas, if the action adds 28 days to February 1, 2019, the action output is March 1, 2019.

---

5. Select the Datetime variable from the **Assign the output to a variable** list to specify the variable to which you want to assign the output.
6. Click **Save**.

To see the output value, convert the value in the Datetime variable to a String variable, then print the value with the **Message Box** action. For more information, see [Using the To string action](#) and [Using the Message box action](#).

## Using the Assign action

Use the **Assign** action to assign one or more String variables, a user-entered value, or an existing Datetime variable into a Datetime variable.

To assign values to a Datetime variable, do the following:

1. Double-click or drag the **To string** action from the **Datetime** node in the **Actions** palette.
2. Select either the **Enter the date time** or **Variable** option.
  - If you have selected the **Enter the date time** option, do the following:
    - a. Enter the date time values or select a String variable.

---

**Note:** To enter multiple variables, separate them with single quotation marks. For example, to input the variables *date1* and *time1*, enter 'date1"time1'.

---

- b. Select the date time format.

Choose from the prebuilt formats or provide a custom format. For more information about the prebuilt formats, see [Date time formats](#).

- If you have selected the **Variable** option, select a variable from the **Source date time variable** list.
3. Select the variable to use to store the output from the **Destination Datetime variable** list.
  4. Click **Save**.

## Using the Subtract action

Use the **Subtract** action to decrease the value in the Datetime variable by a specified time value and unit. For example, you can use this action to decrease the Datetime variable value by three hours or by three days.

To subtract a value from a Datetime variable, do the following:

1. Double-click or drag the **Subtract** action from the **Datetime** node in the **Actions** palette.
2. Select an option from the **Source date and time variable** list to specify the variable that contains the value from which you want to subtract the time unit.
3. Enter the value you want to subtract in the **Time value to add** field.
4. Select an option from the **Time unit to add** list to specify the time unit you want to subtract.

Choose from the following time unit options:

- Milliseconds
- Seconds
- Minutes
- Hours
- Days
- Weeks
- Months
- Years

---

**Note:** This action accounts for leap years. For example, if the action subtracts 31 days from March 31, 2020, the action output is February 29, 2020. Whereas, if the action subtracts 31 days from March 31, 2019, the action output is February 28, 2019.

---

5. Select the Datetime variable from the **Assign the output to a variable** list to specify the variable to which you want to assign the output.
6. Click **Save**.

To see the output value, convert the value in the Datetime variable to a String variable, then print the value with the **Message Box** action. For more information, see [Using the To string action](#) and [Using the Message box action](#).

## Using the To string action

Use the **To string** action to convert a datetime value to a string value. This action enables you to select a predefined format or specify a custom format for the output value.

You can select a predefined format for datetime or provide a custom format based on your requirements. See [Date time formats](#).

To convert a datetime value to string, do the following:

1. Double-click or drag the **To string** action from the **Datetime** node in the **Actions** palette.
2. Select an option from the **Source date and time variable** list to specify the variable that contains the datetime value that you want to convert to a string value.
3. Select an option from the **Formats** list to specify the predefined format in which you want to store the string value.
4. Select the **Custom format** to specify a custom format based on your requirement.

[Date time formats](#)

5. Select the string variable that you want to use to store the converted value from the **Assign the output to a variable** list.

## 6. Click **Save**.

### *Date time formats*

Various predefined formats are available in RPA Workspace that allow you to specify a custom format when you convert a datetime value to a string value.

The **To string** action enables you to convert a datetime value to a string value. This action also enables you to select a predefined datetime format or specify a custom format.

### Predefined datetime format

When you convert a datetime value to a string value, the predefined datetime formats are available in the **Formats** list. The following predefined datetime formats are available:

- **BASIC\_ISO\_DATE**: Converts the datetime value to a `yyyymmdd+offset value` string value.
- **ISO\_LOCAL\_DATE**: Converts the datetime value to a `yyyy-mm-dd` string value.
- **ISO\_OFFSET\_DATE**: Converts the datetime value to a `yyyy-mm-dd+offset value` string value. The offset value indicates the difference between the local time and UTC in hours and minutes.
- **ISO\_DATE**: Converts the datetime value to a `yyyy-mm-dd+offset value` or `yyyy-mm-dd` string value. The system adds an offset value if it is available.
- **ISO\_LOCAL\_TIME**: Converts the datetime value to a `hh:mm:ss.SSS` string value.
- **ISO\_OFFSET\_TIME**: Converts the datetime value to a `hh:mm:ss.SSS+offset value` string value. The offset value indicates the difference between the local time and UTC in hours and minutes.
- **ISO\_TIME**: Converts the datetime value to a `hh:mm:ss.SSS`, or `hh:mm:ss.SSS+offset value` string value. The offset value indicates the difference between the local time and UTC in hours and minutes.
- **ISO\_LOCAL\_DATE\_TIME**: Converts the datetime value to a `yyyy-mm-ddThh:mm:ss.SSS` string value.
- **ISO\_OFFSET\_DATE\_TIME**: Converts the datetime value to a `yyyy-mm-ddThh:mm:ss.SSS+offset value` string value. The offset value indicates the difference between the local time and UTC in hours and minutes.
- **ISO\_ZONED\_DATE\_TIME**: Converts the datetime value to a `yyyy-mm-ddThh:mm:ss.SSS+offset value[zone id]` string value. The offset value indicates the difference between the local time and UTC in hours and minutes. The 'zone id' in the format represents the time zone.
- **ISO\_DATE\_TIME**: Converts the datetime value to a `yyyy-mm-ddThh:mm:ss.SSS`, `yyyy-mm-ddThh:mm:ss.SSS+offset value`, or `yyyy-mm-ddThh:mm:ss.SSS+offset value[zone id]` string value.
- **ISO\_ORDINAL\_DATE**: Converts the datetime value to a `yyyy-[day of the year]`, or `yyyy-[day of the year]+offset value` string value. For example, if the datetime value is 'January 25, 2018', it is formatted as '2018-25' where '25' indicates the day of the year.
- **ISO\_WEEK\_DATE**: Converts the datetime value to a `yyyy-[week of the year]-[day of the week]`, or `yyyy-[week of the year]-[day of the week]+offset value` string value. For example, if the datetime value is 'January 25, 2018', it is formatted as '2018-W4-4' where 'W4' indicates that it is the fourth week of the year and '4' indicates the day of that week.
- **ISO\_INSTANT**: Converts the datetime value to a `yyyy-mm-ddThh:mm:ss.SSSZ` string value.
- **RFC\_1123\_DATE\_TIME**: Converts the datetime value to a `[day of the week], [day of the month] [month in 'MMM' format] [year in 'YYYY' format] hh:mm:ss`, or `[day of the week], [day of the month] [month in 'MMM' format] [year in 'YYYY' format] hh:mm:ss+offset value` string value. For example, if the datetime value is '2018-01-25 10:15', it is formatted as 'Thu, 25 December 2018 10:15:00GMT'. The 'GMT' indicates that there is no offset available.

## Custom datetime format

Use predefined conventions to specify a custom datetime format. The following conventions are available:

- 'y': Enables you to specify a year as 'yy' or 'yyyy'.
- 'M': Enables you to specify a month as 'M', 'MM', 'MMM' (abbreviated name of the month, for example: Jan, Feb) or, 'MMMM' (full name of the month, for example: January, February).
- 'd': Enables you to specify a day as 'dd' or 'd'.
- 'E': Enables you to specify day of the week as 'EEE' (Sun-Sat) or 'EEEE' (Sunday-Saturday).
- 'h' or 'H': Enables you to specify an hour as 'hh' or 'HH'.
- 'm': Enables you to specify a minute in an hour as 'mm'.
- 's': Enables you to specify a second in a minute as 'ss'.
- 'S': Enables you to specify a millisecond as 'SSS'.
- 'z': Enables you to specify a time zone such as 'Pacific Standard Time', 'Indian Standard Time', and so on.
- 'Z': Enables you to specify an offset time for a time zone such as '+0550' for 'Indian Standard Time'.

You can use the above convention to specify the custom format you want to use for converting a datetime value. Below are some of the examples that use the above convention:

Format	Sample output
yyyy-MM-dd	2018-09-30
yyyy-M-d	2020-9-8
dd-MM-yyyy	25-12-2018
yyyy-MM-dd HH:mm:ss	2018-25-12 23:50:55
hh:mm:ss.SSS	22:15:35.889
yyyy-MM-dd HH:mm:ss.SSS	2018-12-25 23:50:55.999
yyyy-MM-dd HH:mm:ss.SSS Z	2018-12-25 23:50:55.999 +0530

## Delay package

Use the **Delay** package to add a timed delay to the logic.

You can use timed delay to add the amount of time a bot waits before moving to the next task. You can specify the amount of time in milliseconds or seconds.

Example: If we give a timed delay of 5 seconds, the bot will wait for 5 seconds and then execute the action following the delay.

The **Delay** package includes the following action:

Action	Description
Delay	<p>Adds a timed delay.</p> <ul style="list-style-type: none"> <li>• Select the delay type as <b>Regular</b> or <b>Random</b>.</li> <li>• Select the <b>Regular</b> option to delay the operation for a fixed period of time.</li> <li>• If you select <b>Random</b>, specify the time range in the <b>From</b> and <b>To</b> fields for the system to select a random delay within the specified range.</li> </ul> <p>You can add <b>Random</b> delay with different waiting time for each bot run at a given command level without having to change the bot.</p> <p>Example: Use <b>Random</b> delay when running bots simultaneously on several machines through a WLM queue before executing a database or recorder, or the FTP action. This would reduce the number of concurrent requests made to a database or the FTP server and the performance of the systems will not be adversely impacted.</p> <ul style="list-style-type: none"> <li>• Select the time units in seconds or milliseconds.</li> </ul>

Watch the following video on how to use the Delay actions:

## Dictionary package

The **Dictionary** package contains actions that enable you to do various operations on dictionary-type values.

### Dictionary data type

A dictionary is a collection of key-value pairs, in which each key has a value. It is similar to an entry in a dictionary where each word has a corresponding definition or explanation. The key is similar to the word and the definition or explanation is similar to its value. The properties of dictionary entries are as follows:

- Keys are unique within each dictionary variable. If you try to duplicate a key, you will overwrite its value.
- Key names cannot be changed.
- Keys are case-sensitive.
- Keys can contain leading and trailing whitespaces.

Each key-value pair in a dictionary is separated by a colon. The key-value pairs are separated from each other by commas. An example of a dictionary is as follows:

```
invoice = {'CustomerID': 9876, 'Location': 'XYZ', 'Amount': 12,34,567}
```

In the example, 'CustomerID', 'Location', and 'Amount' are keys and the corresponding value assigned to each key is separated by a colon.

### Working with variables of dictionary data type

A dictionary variable can hold values of boolean, number, or string data subtype. When initializing a dictionary variable, you can select the **Any** data subtype in order to hold any of the three data subtypes.

You can manually enter values by creating a new variable or selecting an existing one from the Variables menu, and then clicking **Add**.

Use a dictionary variable to hold *email* or *PDF* properties.

## Actions in the Dictionary package

The following actions are available:

Action	Description
<b>Assign</b>	<p>Assigns the value of the source dictionary to the destination dictionary variable.</p> <ul style="list-style-type: none"> <li>• Select the source dictionary variable from the drop-down list or create a new dictionary variable.</li> <li>• Select a variable or create one to hold the output.</li> </ul>
<b>Get</b>	<p>Verifies if a key exists in a dictionary variable and returns the corresponding value.</p> <ul style="list-style-type: none"> <li>• Select the dictionary variable from the drop-down list.</li> <li>• Enter the key name.</li> <li>• Select a dictionary variable or create one to hold the output.</li> </ul>
<b>Put</b>	<p>Assigns a value to a key in the dictionary. If the key is already associated with a value, that value is reassigned to a variable.</p> <ul style="list-style-type: none"> <li>• Select the dictionary variable from the drop-down list.</li> <li>• Enter the key name.</li> <li>• Select the new value to associate with the key.</li> <li>• Select the variable to hold the previous value.</li> </ul>
<b>Remove</b>	<p>Removes a value from the specified key. The removed value is assigned to a variable selected from the <b>Assign removed item to variable</b> list.</p> <p>Removes a value from the specified key and optionally assigns it to a variable selected from the <b>Assign removed item to variable</b> list.</p> <ul style="list-style-type: none"> <li>• Select the dictionary variable from the drop-down list.</li> <li>• Enter the key name.</li> <li>• Select the variable to hold the removed value.</li> </ul>
<b>Size</b>	<p>Retrieves the number of entries in the dictionary specified in the <b>Dictionary variable</b> field and assigns the output to a number variable selected from the <b>Assign the output to variable</b> list.</p>

## DLL package

A dynamic-link library (DLL) file contains a shared library of functions that can be used by Windows programs. The **DLL** package uses a `.dll` file as reference and calls functions from the bot.

### Before you start

Perform the following actions within the **DLL** package as part of using the set of available actions:

1. Use the **Open** action to specify the location of the `.dll` file you want to use and session name. Use this same session name for the other actions. The `.dll` referenced is automatically added as a bot dependency.
2. Use the **Run function** action to run a function from the `.dll` and save its output value as a variable.
3. After running the required functions, close the `.dll` reference. It is important to close the `.dll` reference to free the memory of the operating system.

Windows and appropriate versions of Microsoft .NET Framework are available on the devices running the DLLs.

To review the bot launcher logs, navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\<current month>\Bot_Launcher-<today's date>.log.zip`. Each zipped folder contains a file with data on the code execution, which is useful for debugging.

---

**Note:** If the `.dll` file uses .NET functions or classes from another `.dll` file, you must add the second `.dll` file as a manual dependency of the bot.

#### *Bot dependencies*

---

When you import multiple DLLs that have one main DLL and other DLLs are referenced from it, ensure you have all the DLLs in one folder. Also, the referenced DLLs must be called using a session name that is different from the name used in the main DLL. Your bot execution will fail if the same session name is used in both the main and the referenced DLLs.

### Actions in the DLL package

The **DLL** package includes the following actions:

Action	Description
Close	Closes the current session. In the <b>Session name</b> field, enter the name of the session.
Open	<p>Opens the reference file.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the name of the session.</li> <li>• In the <b>File path</b> field, specify the location of the path.</li> </ul> <hr/> <p><b>Note:</b> The DLL package supports only DLLs written in C#.</p> <hr/>

Action	Description
Run function (Legacy)	See <a href="#">Using the Run function action</a> .  <b>Note:</b> This action is called <b>Run function (Legacy)</b> starting from Enterprise A2019.16. The action is called <b>Run function</b> in Enterprise A2019.15 and previous releases.
Run function	See <a href="#">Using the Run function action</a> .
Set session variable	Assigns the session name to a variable.  Use this action in a parent bot, and then insert the variable containing the session name in DLL-related actions in the child bot to associate the actions with the DLL used in that session. When you run the bot, it passes the session variable to the child bot, which enables the child bot to use the DLL opened in the parent bot.  <b>Note:</b> The parent and child bots must use actions from the same DLL package version to pass the session variable.

## Supported data types in DLL functions

The following table list the variables and data types that you can use as an input or output parameter in DLL functions.

**Note:** The **Run function** and **Run function (Legacy)** actions do not support any user-defined data types in the **Parameter to the function** or **Assign output to variable** field.

Variable type as input or output parameters	Supported data types
String	<ul style="list-style-type: none"> <li>• Char</li> <li>• Byte</li> <li>• String</li> <li>• string</li> <li>• SByte</li> </ul>
Number	<ul style="list-style-type: none"> <li>• UInt16</li> <li>• Int16</li> <li>• UInt32</li> <li>• Int32</li> <li>• UInt64</li> <li>• Int64</li> <li>• Int</li> <li>• Single</li> <li>• Decimal</li> <li>• Float</li> <li>• Double</li> </ul>

Variable type as input or output parameters	Supported data types
Boolean	<ul style="list-style-type: none"> <li>• Boolean</li> <li>• bool</li> </ul>
Datetime	<ul style="list-style-type: none"> <li>• Datetime</li> </ul>
List	<ul style="list-style-type: none"> <li>• UInt16[]</li> <li>• Int16[]</li> <li>• Int32[]</li> <li>• Int64[]</li> <li>• Int[]</li> <li>• Char[]</li> <li>• Single[]</li> <li>• Decimal[]</li> <li>• Float[]</li> <li>• Double[]</li> <li>• Boolean[]</li> <li>• bool[]</li> <li>• Byte[]</li> <li>• String[]</li> <li>• Datetime[]</li> <li>• List&lt;UInt16&gt;</li> <li>• List&lt;Int16&gt;</li> <li>• List&lt;Int32&gt;</li> <li>• List&lt;Int64&gt;</li> <li>• List&lt;Int&gt;</li> <li>• List&lt;Char&gt;</li> <li>• List&lt;Single&gt;</li> <li>• List&lt;Decimal&gt;</li> <li>• List&lt;Float&gt;</li> <li>• List&lt;Double&gt;</li> <li>• List&lt;Boolean&gt;</li> <li>• List&lt;bool&gt;</li> <li>• List&lt;Byte&gt;</li> <li>• List&lt;String&gt;</li> <li>• List&lt;Datetime&gt;</li> <li>• List&lt;SByte&gt;</li> <li>• List&lt;UInt32&gt;</li> <li>• List&lt;UInt64&gt;</li> </ul>

Variable type as input or output parameters	Supported data types
Datatable	<ul style="list-style-type: none"> <li>• UInt16[,]</li> <li>• Int16[,]</li> <li>• Int32[,]</li> <li>• Int64[,]</li> <li>• Int[,]</li> <li>• Char[,]</li> <li>• Single[,]</li> <li>• Decimal[,]</li> <li>• Float[,]</li> <li>• Double[,]</li> <li>• Boolean[,]</li> <li>• bool[,]</li> <li>• Byte[,]</li> <li>• String[,]</li> <li>• Datetime[,]</li> <li>• Byte[,]</li> <li>• UInt32[,]</li> <li>• UInt64[,]</li> </ul>
Dictionary	<ul style="list-style-type: none"> <li>• Dictionary&lt;String,UInt16&gt;</li> <li>• Dictionary&lt;String,Int16&gt;</li> <li>• Dictionary&lt;String,Int32&gt;</li> <li>• Dictionary&lt;String,Int64&gt;</li> <li>• Dictionary&lt;String,Int&gt;</li> <li>• Dictionary&lt;String,Char&gt;</li> <li>• Dictionary&lt;String,Single&gt;</li> <li>• Dictionary&lt;String,Decimal&gt;</li> <li>• Dictionary&lt;String,Float&gt;</li> <li>• Dictionary&lt;String,Double&gt;</li> <li>• Dictionary&lt;String,Boolean&gt;</li> <li>• Dictionary&lt;String,bool&gt;</li> <li>• Dictionary&lt;String,Byte&gt;</li> <li>• Dictionary&lt;String,String&gt;</li> <li>• Dictionary&lt;String,Datetime&gt;</li> <li>• Dictionary&lt;Int,String&gt;</li> <li>• Dictionary&lt;Decimal,String&gt;</li> <li>• Dictionary&lt;Boolean,String&gt;</li> <li>• Dictionary&lt;String,SByte&gt;</li> <li>• Dictionary&lt;String,UInt32&gt;</li> <li>• Dictionary&lt;String,UInt64&gt;</li> </ul>

## Using the Run function (Legacy) action

Use the **Run function (Legacy)** action to run a function within the .dll file and specify the parameters to pass a function and store the output as a variable.

- Use a dictionary variable to pass the parameters to a function. The dictionary key contains the parameter name to pass to a function.

- If the `.dll` file uses .NET functions or classes from another `.dll` file, you must add the second `.dll` file as a manual dependency of the bot.

#### *Bot dependencies*

- When you use **Run function** or the **Run function (Legacy)** action, ensure that you use the supported data types for DLL functions.

See [DLL package](#).

Follow these steps to run a function:

1. In the **Actions** palette, double-click or drag the **Run function (Legacy)** action from the **DLL** package.
2. In the **Session name** field, enter the name of the session.
3. In the **Enter the namespace** field, specify the namespace.  
You can specify any of the namespaces defined in the DLL file.

---

**Note:** Ensure that the value you have provided in the field is correct.

---

**Important:** This field is case-sensitive.

---

4. In the **Enter the class name** field, specify the name of the class.  
You can specify the name of any classes available in the namespace.

---

**Important:** This field is case-sensitive.

---

5. In the **Enter the name of function to be executed** field, specify the name of the function to execute.  
Ensure that the name you have provided is correct and available in the class specified in the previous step.

---

**Important:** This field is case-sensitive.

---

6. Optional: In the **Parameters to the function** list, select the variable that contains all the parameters needed by the function.  
You can use Boolean, datetime, dictionary, list, number, string, or table variable types to pass parameters to the function.

---

**Note:** Use the dictionary subtype Any to enable the bot to pass parameters of different data types to the function including Boolean, numeric, and string.

---

Specify the dictionary key as the parameter name to provide the dictionary value as the parameter value. For example, you have a function `ReturnSum` that returns the sum of two numeric values and want to pass `Param1` and `Param2` as its parameters. Configure a dictionary variable with two keys: `Param1` and `Param2`, each with the value that you want to pass.

7. Optional: In the **Assign output to variable** list, select a variable to use to store the output of the function.  
You can use Boolean, datetime, dictionary, list, number, string, or table variable types to store the output based on the type of output the function returns.
8. Click **Save**.

## Using the Run function action

Use the **Run function** action to run a function within the `.dll` file and specify the parameters to pass a function and store the output as a variable.

- This action enables you to pass a parameter of any type. If you want to use a dictionary variable to pass the parameters to a function, use the **Run function (Legacy)** action.

*Using the Run function (Legacy) action*

- The **Run function** action does not support the use of Windows Forms.
- If the .dll file uses .NET functions or classes from another .dll file, you must add the second .dll file as a manual dependency of the bot.

*Bot dependencies*

- This action supports overloaded functions starting from Enterprise A2019.17. The action can handle .dll files that contain multiple functions of the same name. It calls the function based on the number of parameters passed.
- When you use **Run function** or the **Run function (Legacy)** actions, ensure that you use the supported data types for DLL functions.

*DLL package*

Follow these steps to run a function:

1. In the **Actions** palette, double-click or drag the **Run function** action from the **DLL** package.
2. In the **Session name** field, enter the name of the session.
3. In the **Enter the namespace** field, specify the namespace.  
You can specify any of the namespaces defined in the DLL file.

---

**Note:** Ensure that the value you have provided in the field is correct.

---



---

**Important:** This field is case-sensitive.

---

4. In the **Enter the class name** field, specify the name of the class.  
You can specify the name of any classes available in the namespace.

---

**Important:** This field is case-sensitive.

---

5. In the **Enter the name of function to be executed** field, specify the name of the function to execute.  
Ensure that the name you have provided is correct and available in the class specified in the previous step.

---

**Important:** This field is case-sensitive.

---

6. Optional: In the **Input parameters** section, click the **Add Parameters** button.
  - a) In the **DLL parameter details** dialog box, enter the name of the parameter in the **Parameter name** field.
  - b) Select the data type of the parameter from the **Parameter type** list.
  - c) Enter the value you want to pass in the **value** field.

Repeat Step 6 to add multiple parameters.

---

**Important:** The names of the parameters you add and their order must be the same as in the DLL function.

---

7. Optional: In the **Assign output to variable** list, select a variable to use to store the output of the function.  
You can use Boolean, datetime, dictionary, list, number, string, or table variable types to store the output based on the type of output the function returns.

---

**8.** Click **Save**.

## Email package

The **Email** package contains actions to automate email-related tasks through Exchange Web Services (EWS), Microsoft Outlook, and other email servers. You can use these actions for sending, receiving, and modifying messages, folders, and the status of messages.

The **Email** package supports EWS, POP3, SMTP, and IMAP protocols and enables you to perform the following tasks:

- Manage and organize email messages and folders.
- Download attachments from emails to specific folders on devices.
- Extract data from emails to variables, to use as extracted data in other applications. For example, you can extract data from a sender's email and store it in a Microsoft Excel spreadsheet.

---

**Note:** If you want to automate an email-related task on a device using Microsoft Outlook, ensure that the Outlook application is open.

---

### Before you start

Perform the following actions within the **Email** package as part of using the set of available actions:

**1.** Establish a connection with an email server using the **Connect** action.

While establishing the connection, specify the details and session name of the email server. Use this same session name for the other actions.

You do not have to establish a connection for the **Forward**, **Reply**, and **Send** actions because you will add the sender and email server details when you use these actions.

**2.** Use the actions to automate a task.

**3.** After you have automated all the email-related tasks, terminate the connection to the mail server using the **Disconnect** action.

---

**Important:** You must enable POP settings to automate an email-related task on the Gmail server using the POP3 protocol. See [Read Gmail messages using POP](#).

---

### Actions in the Email package

---

**Note:** Some of the actions must be used within a **Loop** action. See [Using the For each mail in mail box iterator](#).

---

Emails are retrieved based on the sequence of the folders listed in the inbox field. Within each folder, emails are retrieved based on received date and time in the last in, first out (LIFO) order. Additionally, you can apply filters on the following fields:

- Types of emails: **All**, **Read**, and **Unread**
- Subject
- From a specific folder
- From specific sender

- Before, on, or after received date

The **Email** package includes the following actions:

Action	Description
Change status	<p>Changes the statuses of emails to read or unread. Use this action within a <b>Loop</b> action.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</li> <li>• Select the <b>Read</b> or <b>Unread</b> option to change the status of the email.</li> </ul> <hr/> <p><b>Note:</b> POP3 servers do not support and maintain the read or unread status of emails.</p>
Check if folder exists	<p>Checks whether a folder with the name you specified exists in the email server.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</li> <li>• In the <b>Folder name</b> field, enter the name of the folder you want to check.</li> </ul> <hr/> <p><b>Note:</b> This field is not case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• In the <b>Select the destination boolean variable</b> list, select a Boolean variable to store the output of the existing folder. The output is either True (file exists) or False (does not exist). The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Connect	See <a href="#">Using the Connect action</a> .
Delete	<p>Deletes the most recent email from the inbox. Use this action within a <b>Loop</b> action. In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</p> <hr/> <p><b>Note:</b> Microsoft Outlook does not currently support this action.</p>
Delete all	<p>Deletes read, unread, or all emails from the mail server.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</li> <li>• Select the <b>All</b>, <b>Read</b>, or <b>Unread</b> option to specify the type of email you want to delete.</li> </ul> <hr/> <p><b>Note:</b> For an email server using the POP3 protocol, this action deletes all the email messages.</p> <hr/> <p><b>Note:</b> Microsoft Outlook does not currently support this action.</p>

Action	Description
Disconnect	Terminates the connection established with the email server. In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.
Forward	See <a href="#">Using the Forward action</a> .
Move all	<p>Moves an email from one folder to another in the email server.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</li> <li>In the <b>Destination folder path in mailbox</b> field, provide the path to the location where you want to move the email.</li> <li>Select which emails to move: <b>All</b>, <b>Read</b>, or <b>Unread</b>.</li> <li>In the <b>From a specific folder</b> field, specify the folder from which to move the emails. For example, <code>Inbox/project1</code>.</li> </ul> <hr/> <p><b>Note:</b> For an email server using the POP3 protocol, you can retrieve only from the inbox.</p> <hr/> <ul style="list-style-type: none"> <li><b>Optional:</b> Specify any of the following conditions: <ul style="list-style-type: none"> <li><b>When subject contains:</b> Enter keywords separated by a semicolon. <i>How subject filter works when moving emails</i></li> <li><b>From specific senders:</b> Enter senders' email addresses separated by a semicolon.</li> <li><b>When received date is on or after</b> or <b>When received date is before:</b> Select a datetime variable from the list.</li> </ul> </li> </ul> <hr/> <p><b>Note:</b> Because folders are not supported in Gmail, this action is not supported for Gmail.</p> <hr/>
Reply	See <a href="#">Using Reply action</a> .
Save all attachments	<p>Saves attachments from all emails on the email server to a specified folder.</p> <hr/> <p><b>Note:</b> If connected to an Outlook server, images embedded in the emails are downloaded along with attachments.</p> <hr/> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</li> <li>Select which emails to save: <b>All</b>, <b>Read</b>, or <b>Unread</b>.</li> <li>In the <b>Save attachments to folder</b> field, specify the location to save the attachments.</li> </ul> <hr/> <p><b>Note:</b> This field is not case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li><b>Overwrite file(s):</b> select this option to overwrite an existing file with the same name. If this option is not selected, the downloaded attachment is saved with the same filename suffixed with a numeric value; it does not overwrite the existing file.</li> </ul> <p>You can save attachments with a filename that contains a TAB character.</p>

Action	Description
Save attachments	<p>Saves attachments from one email to a specified folder. Use this action within a <b>Loop</b> action.</p> <hr/> <p><b>Note:</b> If connected to an Outlook server, images embedded in the emails are downloaded along with attachments.</p> <hr/> <ul style="list-style-type: none"> <li>In the <b>Save attachments to folder</b> field, specify the location to save the attachments.</li> </ul> <hr/> <p><b>Note:</b> This field is not case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li><b>Overwrite file(s):</b> select this option to overwrite an existing file with the same name. If this option is not selected, the downloaded attachment is saved with the same filename suffixed with a numeric value; it does not overwrite the existing file.</li> </ul>
Save email	<p>Saves an email message as an EML file to a folder. Use this action within a <b>Loop</b> action.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the name of the session you used to connect to the email server in the <b>Connect</b> action.</li> <li>In the <b>Save emails to folder</b> field, specify the location to save the email.</li> </ul> <hr/> <p><b>Note:</b> This field is not case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li><b>Overwrite file(s):</b> select this option to overwrite the existing file with the same name. If this option is not selected, the downloaded attachment is saved with the same filename suffixed with a numeric value; it does not overwrite the existing file.</li> </ul> <hr/> <p><b>Note:</b> Microsoft Outlook does not currently support this action.</p>
Send	See <a href="#">Using the Send action</a> .

### Related reference

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

#### [Email server settings](#)

The details about the mail server you provide when establishing a connection varies based on the email server to which you are connecting.

#### [Using dictionary variable for email properties](#)

When you automate an email-related task, RPA Workspace retrieves various properties of an email and stores the values of these properties in a dictionary variable. These properties are stored in a dictionary variable when you use an email action within a loop action.

## Using the Connect action

Use the **Connect** action to establish a connection with an email server. This is the first action you must use to automate an email-related task.

You can use EWS OAuth to authenticate with the Exchange server for email automation. Register your application with the Microsoft Identity platform to obtain the client ID and tenant ID.

### *Register an application*

- When registering the application, set the redirect URI value to `https://outlook.office365.com` for the application.
- Select **Yes** to treat the application as a client.

This action enables you to provide the email server credentials and details, and associate this information with a session name. Use this same session name for the other Email actions, so you only have to provide the server information once.

To establish a connection with an email server, follow these steps:

1. In the **Actions** palette, double-click or drag the **Connect** action from the **Email** package.
2. Enter a session name.

3. In the **Outlook, Email server**, or **EWS** option, specify whether you want to establish a connection with Microsoft Outlook or a mail server.

- If you have selected the **Outlook** option, you do not need to provide any additional details.
- If you have selected the **Email server** option, complete the following fields:

---

**Note:** For information about the host and port to be used for the various mail servers, see [Email server settings](#).

---

- **Host:** Enter the name of the mail server you want to connect.

---

**Note:** This field is not case-sensitive.

---

- **Port:** Enter the port you want to use to establish the connection.
  - **Username:** Click **Credential** to use a value available in the Credential Vault or String to manually enter a username. [Credentials and lockers](#)
  - **Password:** Click **Credential** to use a value available in the Credential Vault or String to manually enter a password. [Credentials and lockers](#)
  - **Use secure connection (SSL/TLS):** Select this option if you want to use a secure connection with the mail server.
  - **Protocol:** Select the **IMAP** or **POP3** option to specify the protocol used for the mail server.
- If you have selected the **EWS** option, complete the following fields:
    - **Username:** Enter the username you want to use to access the mail server.  
For example, john.smith@myCompanyName.com  
Choose the username as a **Credential** or **String**.
    - **Password:** Enter the password for the username you have provided.  
Choose the username as a **Credential** or **String**.
    - **Optional: Domain name:**
      - If you are an Office 365 customer and you leave this field blank, RPA Workspace uses smtp.office365.com to connect to the server.
      - If you are an Office 365 customer and you have entered a domain name in the **username** field, you **must** enter `smtp.office365.com` in this field.
      - If you are not an Office 365 customer, enter your company domain name. Otherwise, RPA Workspace uses the domain name you provided in the **Username** field.
    - **Exchange Version:** Select the version your organization is using:
      - Exchange2010
      - Exchange2010\_SP1
      - Exchange2010\_SP2
      - Exchange2007\_SP1
    - **Authentication type:** Select the authentication type:
      - Basic
      - OAuth2

If you select OAuth2, the **Username**, **Password**, **Client ID**, and **Tenant ID** fields are mandatory to establish the connection to the server. The recommended practice is to use OAuth Authentication for enhanced security.
    - **Client ID** and **Tenant ID:** Enter the unique client and tenant IDs generated when you registered the application in the Microsoft Azure portal.

- **Authorize:** Click this option to sign in to your account, accept the permissions requested to authenticate, and establish a connection with the EWS OAuth server.

---

**Note:** You have to establish the connection only when connecting for the first time.

---

#### 4. Click **Save**.

##### *Email server settings*

The details about the mail server you provide when establishing a connection varies based on the email server to which you are connecting.

The following table provides information about the host name and the port you must use when establishing a connection to the specified mail server:

<b>Server</b>	<b>For reading or retrieving emails</b>	<b>For sending emails</b>
Microsoft Outlook/Microsoft Office 365	<b>Host:</b> outlook.office365.com <b>Port:</b> 993	<b>Host:</b> outlook.office365.com, <b>Port:</b> 993 <b>Host:</b> smtp.office365.com <b>Port:</b> 587
Gmail	<b>Host:</b> imap.gmail.com <b>Port:</b> 993	<b>Host:</b> smtp.gmail.com <b>Port:</b> 587
Yahoo	<b>Host:</b> imap.mail.yahoo.com <b>Port:</b> 993	<b>Host:</b> smtp.mail.yahoo.com <b>Port:</b> 465 or 587
MSN	<b>Host:</b> imap-mail.outlook.com <b>Port:</b> 993 <b>For POP3:</b> <b>Host:</b> pop-mail.outlook.com <b>Port:</b> 993	<b>Host:</b> smtp-mail.outlook.com <b>Port:</b> 465 or 587

The Email package supports nonstandard ports in the range of 1 through 65535 for the SMTP server.

#### Additional configuration for Gmail and Yahoo

If you are using a Gmail account to automate an email-related task, ensure that the option to allow access for less secured apps is enabled. This is required to enable a TaskBot to send email using a Gmail account.

To enable access for less secure apps:

1. Log in to your Gmail or Yahoo account.
2. Go to account settings.
3. Enable the option to allow less secure apps.

If you are using a Yahoo account to automate an email-related task, ensure that you generate the app password from the Yahoo account security page. Use the app password and the email address to log in to your email account.

## Using the Forward action

Use the **Forward** action to forward emails and attachments to one or more recipients. To forward emails as plain text or HTML through Exchange Web Services (EWS), Microsoft Outlook, or other email servers, use this action within a **Loop** action.

To forward emails, follow these steps:

1. In the **Actions** palette, double-click or drag the **Forward** action from the **Email** package.
2. In the **To address** field and the optional **Cc** and **Bcc** fields, enter the email addresses of the recipients.

---

**Note:** The **To address**, **Cc**, and **Bcc** fields are not case-sensitive.

---

3. Optional: In **Attachment**, select the attachment from a location:
  - **Control Room file:** Enables you to select an attachment that is available in a folder.
  - **Desktop profile:** Enables you to select an attachment that is available on your device.

To attach multiple files, separate each file path with a comma.

  - **Variable:** Enables you to specify the file variable that contains the location of the attachment.
4. Optional: Select the **Validate if attachment is missing** check box to verify that you have attached a file and the attached file exists.

Option	Result
The <b>Validate if attachment is missing</b> check box is selected	If a file is not attached, the email is not sent and the bot encounters an error.
The <b>Validate if attachment is missing</b> check box is not selected	The email is sent even if a file is not attached.

5. In the **Plain text** or **HTML** options, select the format that you want to use.
6. Optional: Enter the content you want to send along with the email in the **Message** field.  
The email will be appended to the message you have specified.
7. Optional: Select the **Include Go Green message at the end of the email** check box.  
The Go Green message appends the following text to the bottom of the email body: `Please consider the environment before printing. Let's Go Green!`

8. Select the **Email server**, **EWS** or **Outlook** option from the **Send email via** list to specify whether to send the emails using Microsoft Outlook or a mail server.
- If you have selected the **Outlook** option, you do not need to provide any additional details.
  - If you have selected the **Email server** option, complete the following fields:

---

**Note:** For information about the host and port to be used for the various mail servers, see [Email server settings](#).

---

- **Email server host:** Enter the host you want to connect.

---

**Note:** If you use the host Outlook.office365.com, there is a limit of 30 messages sent per minute and 10,000 recipients per day.

---

- **Email server port:** Enter the port you want to use to establish the connection.
- **Use secure connection (SSL/TLS):** Select this option if you want to use a secure connection with the mail server.
- **My server requires authentication:** Select this option if the server requires credentials for access.
  - **Username:** Enter the username you want to use to access the mail server.  
Choose the username as a **Credential** or **String**.
  - **Password:** Enter the password for the username you have provided.  
Choose the password as a **Credential** or **String**.
- If you have selected the **EWS** option, complete the following fields:
  - **Username:** Enter the username you want to use to access the mail server.  
For example, john.smith@myCompanyName.com  
Choose the username as a **Credential** or **String**.
  - **Password:** Enter the password for the username you have provided.  
Choose the username as a **Credential** or **String**.
  - **Optional: Domain name:**
    - If you are an Office 365 customer and you leave this field blank, RPA Workspace uses smtp.office365.com to connect to the server.
    - If you are an Office 365 customer and you have entered a domain name in the **username** field, you **must** enter `smtp.office365.com` in this field.
    - If you are not an Office 365 customer, enter your company domain name. Otherwise, RPA Workspace uses the domain name you provided in the **Username** field.
  - **Exchange Version:** Select the version your organization is using:
    - Exchange2010
    - Exchange2010\_SP1
    - Exchange2010\_SP2
    - Exchange2007\_SP1
  - **Authentication type:** Select the authentication type:
    - Basic
    - OAuth2

If you select OAuth2, the **Username**, **Password**, **Client ID**, and **Tenant ID** fields are mandatory to establish the connection to the server. The recommended practice is to use OAuth Authentication for enhanced security.

- **Client ID** and **Tenant ID**: Enter the unique client and tenant IDs generated when you registered the application in the Microsoft Azure portal.
- **Authorize**: Click this option to sign in to your account, accept the permissions requested to authenticate, and establish a connection with the EWS OAuth server.

---

**Note:** You have to establish the connection only when connecting for the first time.

---

9. Click **Save**.

## Using Reply action

Use the **Reply** action to send a response to an email with the same subject.

To send a reply to emails as plain text or HTML through Exchange Web Services (EWS), Microsoft Outlook, or other email servers, use this action within a **Loop** action. This action does not include any files attached to the original email.

Follow these to reply to an email:

1. In the **Actions** palette, double-click or drag the **Reply** action from the **Email** package.
2. In the **Cc** and **Bcc** fields, enter the email address of additional recipients.

---

**Note:** The **Cc** and **Bcc** fields are not case sensitive.

---

3. Optional: In **Attachment**, select the attachment from a location:
  - **Control Room file**: Enables you to select an attachment that is available in a folder.
  - **Desktop profile**: Enables you to select an attachment that is available on your device.

To attach multiple files, separate each file path with a comma.

  - **Variable**: Enables you to specify the file variable that contains the location of the attachment.
4. Optional: Select the **Validate if attachment is missing** check box to verify that you have attached a file and the attached file exists.

Option	Result
The <b>Validate if attachment is missing</b> check box is selected	If a file is not attached, the email is not sent and the bot encounters an error.
The <b>Validate if attachment is missing</b> check box is not selected	The email is sent even if a file is not attached.

5. In the **Plain text** or **HTML** options, select the format that you want to use.
6. Optional: Enter the content you want to send along with the email in the **Message** field.  
The email will be appended to the message you have specified.
7. Optional: Select the **Include Go Green message at the end of the email** check box.  
The Go Green message appends the following text to the bottom of the email body: `Please consider the environment before printing. Let's Go Green!`
8. Select the **Email server**, **EWS** or **Outlook** option from the **Send email via** list to specify whether to send the emails using Microsoft Outlook or a mail server.
  - If you have selected the **Outlook** option, you do not need to provide any additional details.

- If you have selected the **Email server** option, complete the following fields:

---

**Note:** For information about the host and port to be used for the various mail servers, see [Email server settings](#).

---

- **Email server host:** Enter the host you want to connect.

---

**Note:** If you use the host Outlook.office365.com, there is a limit of 30 messages sent per minute and 10,000 recipients per day.

---

- **Email server port:** Enter the port you want to use to establish the connection.
- **Use secure connection (SSL/TLS):** Select this option if you want to use a secure connection with the mail server.
- **My server requires authentication:** Select this option if the server requires credentials for access.
  - **Username:** Enter the username you want to use to access the mail server.  
Choose the username as a **Credential** or **String**.
  - **Password:** Enter the password for the username you have provided.  
Choose the password as a **Credential** or **String**.
- If you have selected the **EWS** option, complete the following fields:
  - **Username:** Enter the username you want to use to access the mail server.  
For example, john.smith@myCompanyName.com  
Choose the username as a **Credential** or **String**.
  - **Password:** Enter the password for the username you have provided.  
Choose the username as a **Credential** or **String**.
  - **Optional: Domain name:**
    - If you are an Office 365 customer and you leave this field blank, RPA Workspace uses smtp.office365.com to connect to the server.
    - If you are an Office 365 customer and you have entered a domain name in the **username** field, you **must** enter `smtp.office365.com` in this field.
    - If you are not an Office 365 customer, enter your company domain name. Otherwise, RPA Workspace uses the domain name you provided in the **Username** field.
  - **Exchange Version:** Select the version your organization is using:
    - Exchange2010
    - Exchange2010\_SP1
    - Exchange2010\_SP2
    - Exchange2007\_SP1
  - **Authentication type:** Select the authentication type:
    - Basic
    - OAuth2

If you select OAuth2, the **Username**, **Password**, **Client ID**, and **Tenant ID** fields are mandatory to establish the connection to the server. The recommended practice is to use OAuth Authentication for enhanced security.
  - **Client ID** and **Tenant ID:** Enter the unique client and tenant IDs generated when you registered the application in the Microsoft Azure portal.

- **Authorize:** Click this option to sign in to your account, accept the permissions requested to authenticate, and establish a connection with the EWS OAuth server.

---

**Note:** You have to establish the connection only when connecting for the first time.

---

9. Click **Save**.

## Using the Send action

Use the **Send** action to send an email. This action enables you to send an email to one or more recipients from Microsoft Outlook or a mail server, attach files, and select to send the email in plain text or HTML format.

The **Send** action enables you to attach multiple files of various formats to an email. There is no restriction on the type of file you can attach or its size. However, restrictions implemented by the mail server you are using to send an email apply. For example, a task will fail if the files you have attached to the email you are sending do not adhere to the restrictions applied by the mail server.

To send an email from a Gmail or Yahoo account, enable access to a less secure app for that account. See [Email server settings](#).

1. In the **Actions** palette, double-click or drag the **Send** action from the **Email** package.
2. In the **To address** field and the optional **Cc** and **Bcc** fields, enter the email addresses of the recipients.

---

**Note:** The **To address**, **Cc**, and **Bcc** fields are not case-sensitive.

---

3. In the **Subject** field, enter the subject for the email.
4. Optional: In **Attachment**, select the attachment from a location:
  - **Control Room file:** Enables you to select an attachment that is available in a folder.
  - **Desktop profile:** Enables you to select an attachment that is available on your device.

To attach multiple files, separate each file path with a comma.

  - **Variable:** Enables you to specify the file variable that contains the location of the attachment.
5. Optional: Select the **Validate if attachment is missing** check box to verify that you have attached a file and the attached file exists.

Option	Result
The <b>Validate if attachment is missing</b> check box is selected	If a file is not attached, the email is not sent and the bot encounters an error.
The <b>Validate if attachment is missing</b> check box is not selected	The email is sent even if a file is not attached.

6. In the **Plain text** or **HTML** options, select the format that you want to use.
7. Optional: Enter the content you want to send along with the email in the **Message** field.  
The email will be appended to the message you have specified.
8. Optional: Select the **Include Go Green message at the end of the email** check box.  
The Go Green message appends the following text to the bottom of the email body: `Please consider the environment before printing. Let's Go Green!`
9. Select the **Email server**, **EWS** or **Outlook** option from the **Send email via** list to specify whether to send the emails using Exchange Web Services (EWS), Microsoft Outlook, or a mail server.
  - If you selected the **Outlook** option, you do not have to provide any additional details.

---

**Note:** Multiple accounts or shared mailboxes are not supported on the local system. Set up only one account or mailbox to access mails using bots.

---

Option	Steps
<b>Email server</b>	<p>For information about the host and port to be used for the various mail servers, see <a href="#">Email server settings</a>.</p> <ul style="list-style-type: none"> <li>• <b>From address</b> Enter the email address.</li> </ul> <hr/> <p><b>Note:</b> If the mail server does not support sending an email using an alias email address, use the same email ID in the <b>From address</b> as provided in the <b>Username</b> field while configuring the mail server.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Email server host:</b> Enter the host you want to connect.</li> </ul> <hr/> <p><b>Note:</b> If you use the host Outlook.office365.com, there is a limit of 30 messages sent per minute and 10,000 recipients per day.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Email server port:</b> Enter the port you want to use to establish the connection.</li> <li>• <b>Use secure connection (SSL/TLS):</b> Select <b>True</b> or <b>False</b>, or insert a Boolean variable.</li> <li>• <b>My server requires authentication:</b> Select <b>True</b> or <b>False</b>, or insert a Boolean variable.</li> </ul> <ul style="list-style-type: none"> <li>• <b>Username:</b> Enter the username you want to use to access the mail server. Choose the username as a <b>Credential</b> or <b>String</b>.</li> <li>• <b>Password:</b> Enter the password for the username you have provided. Choose the password as a <b>Credential</b> or <b>String</b>.</li> </ul>

Option	Steps
<b>EWS</b>	<ul style="list-style-type: none"> <li>• <b>Username:</b> Enter the username you want to use to access the mail server. For example, john.smith@myCompanyName.com Choose the username as a <b>Credential</b> or <b>String</b>.</li> <li>• <b>Password:</b> Enter the password for the username you have provided. Choose the username as a <b>Credential</b> or <b>String</b>.</li> <li>• <b>Optional: Domain name:</b> <ul style="list-style-type: none"> <li>• If you are an Office 365 customer and you leave this field blank, RPA Workspace uses smtp.office365.com to connect to the server.</li> <li>• If you are an Office 365 customer and you have entered a domain name in the <b>username</b> field, you <b>must</b> enter smtp.office365.com into this field.</li> <li>• If you are not an Office 365 customer, enter your company domain name. Otherwise, RPA Workspace uses the domain name you provided in the <b>Username</b> field.</li> </ul> </li> <li>• <b>Exchange Version:</b> Select the version your organization is using: <ul style="list-style-type: none"> <li>• Exchange2010</li> <li>• Exchange2010_SP1</li> <li>• Exchange2010_SP2</li> <li>• Exchange2007_SP1</li> </ul> </li> </ul>

10. Click **Save**.

## Using the For each mail in mail box iterator

You must use certain **Email** actions within a **Loop** action. Use the **For each mail in mail box** iterator to repeat a set of actions on all the emails within the specific parameters.

First, connect to the email server. *Using the [Connect action](#)*

You must use the following Email actions within a loop:

- **Change status**
- **Delete**
- **Save attachments**
- **Save email**

To use an Email action within a loop, follow these steps:

1. Double-click or drag the **Loop** action from the **Loop** package in the **Actions** palette.
2. Select the **For each mail in mail box** option from the **Iterator** list.
3. In the **Session name** field, enter the name of the session you used to connect to the email server in the **Connect** action.
4. In the **ALL**, **READ**, or **UNREAD** options, specify the type of email to retrieve from the email server.

---

**Note:** For an email server that uses the POP3 protocol, all emails are retrieved.

---

5. Optional: Specify the folder from which you want to retrieve the emails.
  - **Microsoft Outlook** and **Yahoo:** You can specify the name of the folder.

For example, `Inbox`, `Sent`, `Inbox/Sales`, `Inbox/IT` and so on. The `Sales` and `IT` folders in this example are user-created folders and not available by default.

- **Gmail:**

- To retrieve emails from the default folders, you must use `[Gmail]/FOLDER`, except for the `Inbox` folder.

For example, `[Gmail]/Draft`, `[Gmail]/Important`, `[Gmail]/Trash`, and so on.

- To retrieve emails from the folders you have created or the `Inbox` folder, you must specify the folder names as they are.

For example, if you have created folders called `Bank` and `Sports` in your Gmail, specify `Bank` and `Sports` without the `[Gmail]` prefix to retrieve emails from these folders.

6. Optional: In the **When subject contains** field, specify a value to retrieve emails containing the value you specified in their subject.
7. Optional: In the **From specific senders** field, specify the email addresses to retrieve the emails.
8. Optional: In the **When received date is on or after** list, select an option to retrieve specific emails on or after a certain date.
9. Optional: In the **When received date is on or before** list, select an option to retrieve specific emails on or before a certain date.

If you have specified values for Steps 6 through 9, the system retrieves only those emails that meet all the criteria. For example, if you specify `Bank` in Step 5, `Statement` in Step 6, and `abcbank@xyz.com` in Step 7, the system retrieves emails from the `Bank` folder that contain `Statement` in the subject and were received from the `abcbank@xyz.com` email address.

10. In the **Plain text** or **HTML** options, select the format that you want to use.

11. Choose one of the following options from **Use local timezone**

- True: The email received date and time is displayed in the local time zone.
- False: The email received date and time is displayed in the UTC time zone.
- Variable: Enter a Boolean variable.

12. Optional: In the **Assign the current value to variable** list, select or create a dictionary variable.

The dictionary variable stores the properties of each email. [Using dictionary variable for email properties.](#)

13. Click **Save**.

Insert a **Message Box** action into the **Loop** container to print the subject of each email. Use the following message body, substituting the generic variable name for the one you used in Step 10:

```
$dictionaryVar{emailSubject}$
```

#### *Using dictionary variable for email properties*

When you automate an email-related task, RPA Workspace retrieves various properties of an email and stores the values of these properties in a dictionary variable. These properties are stored in a dictionary variable when you use an email action within a loop action.

Some of the email properties that RPA Workspace retrieves are its subject, recipients, senders, message, and received date and time. The email properties are stored in a dictionary variable within the following dictionary keys:

- `emailSubject`
- `emailFrom`
- `emailTo`
- `emailCc`
- `emailBcc`

- emailMessage
- emailReceivedTime
- emailReceivedDate
- emailSentTime
- emailSentDate

The system automatically associates the properties of an email with the appropriate dictionary keys. You can use the values stored in these dictionary keys in another task, store them in a database, or for any other purpose. These keys are available in the system and you must use them as specified above. For example, if you have created a dictionary variable 'Test' and want to display the subject and sender of an email in a message prompt, you must enter `Test{emailSubject}` and `Test{emailFrom}` in the appropriate fields.

If you press F2 to use a variable in a field, you must select `Test` from the **Choose a variable** list and enter `emailSubject` in the **Dictionary key** field in the **Insert a variable** dialog box to store the subject of an email in that field. Similarly, you can enter `emailFrom` in the **Dictionary key** field to use the email address of the sender of an email in a field.

The dictionary key variable is required for all email-related tasks you automate from Microsoft Outlook and any mail server if you want to use the email properties. You can use the dictionary key variable for the following **Email** actions:

- **Change status**
- **Delete**
- **Forward**
- **Reply**
- **Save attachments**
- **Save email**

---

**Note:** The time required to save an email varies based on the size of the attachments available in that email.

---

## How subject filter works when moving emails

In the **Move all** action in the Email package, learn how the subject filter works in order to move your emails from one folder to another in the email or Microsoft Outlook server.

You can use the keywords in the email subject field to filter emails. If keywords are added within quotes, the bot will look for an exact match of keywords in the subject field to filter and retrieve emails.

## How subject filter works in email server and Outlook

The filter works the same way for an email or outlook server when the subject field contains single or multiple texts.

Single subject	Email server and Outlook
Single text within double quotation marks	Retrieves emails with the exact subject text and is case-sensitive. Example: <code>[Subject]="Automation"</code> : The filter retrieves emails where the subject text includes "Automation" as an exact word.

Single subject	Email server and Outlook
Multiple text within double quotation marks	Retrieves emails with the exact subject text and is case-sensitive. Example: [Subject]=[Automation Anywhere]: The filter retrieves emails where subject text includes "Automation Anywhere" as an exact phrase.
Single text without double quotation marks	Retrieves emails that have the similar text and is not case-sensitive. Example: [Subject]=[Automation]: The filter searches and retrieves emails where the subject text includes Automation.
Multiple text without double quotation marks	Retrieve emails with any text or combination of text and is not case-sensitive. Example: [Subject]=[Automation Anywhere]: The filter searches and retrieves emails where subject text includes Automation or Automation Anywhere.

The filter works differently for an email and outlook server when the subject field contains multiple subjects separated by semi-colon.

Multiple subjects separated by semicolon	Email server	Microsoft Outlook
Subjects within double quotation marks	Retrieve emails for each subject that is an exact match and is case-sensitive. Example: [Subject 1] =["Delivery Failure"]; [Subject 2] =["Mail server not found"]  Individual subjects separated by a semicolon with an exact match are searched. The filter retrieves emails with the subject line "Delivery Failure" and/or "Mail server not found".	Retrieves emails with the complete subject line that is an exact match including the semicolon and double quotation marks. Example: [Subject 1] =["Delivery Failure"]; [Subject 2] =["Mail server not found"], separated by a semicolon.  The filter retrieves emails with the subject line as one string that is an exact match with the semicolon, such as "Delivery Failure ; Mail server not found".
Subjects without double quotation marks	Retrieve emails for each subject and is not case-sensitive. Example: [Subject 1]= [Delivery Failure];[Subject 2]= [Mail server not found]  The filter retrieves emails that include the subject line with text as Delivery Failure or Mail server not found.	Retrieve emails with the complete subject line including the semicolon. Example: [Subject 1]= ["Delivery Failure"]; [Subject 2]= ["Mail server not found"], separated by a semicolon.  The filter retrieves emails with the subject line that includes text as one string with the semicolon but is not an exact match, such as: Delivery Failure ; Mail server not found or delivery failure ; mail server not found.

Multiple subjects separated by semicolon	Email server	Microsoft Outlook
<p>Some subject in double quotation marks and some without double quotation marks</p>	<p>Retrieve emails for each subject. Subjects within double quotation marks are an exact match. Subjects without double quotes are not case-sensitive.</p> <p><b>Example:</b> [Subject 1]=[Delivery Failure];[Subject 2] = ["Mail server not found"]</p> <ul style="list-style-type: none"> <li>• For Subject 1, the filter searches and retrieves emails that include the text in the subject line.</li> <li>• For Subject 2, the filter searches and retrieve emails with the exact text in the subject line.</li> </ul>	<p>Retrieve emails with the complete subject line that is an exact match including the semicolon.</p> <p><b>Example:</b> [Subject 1]=[Delivery Failure];[Subject 2]= ["Mail server not found"], separated by a semicolon.</p> <p>The filter retrieves emails with the subject line as one string that is an exact match with the semicolon, such as: Delivery Failure ; Mail server not found.</p>

## Error handler package

The **Error handler** package contains actions that enable you to easily handle exceptions that a bot encounters and transfers control to the other actions within that bot.

The Error handler actions enable you to separate the actions that you want to use to perform a task from the actions that you want to use to handle an exception. Handling exceptions ensures that a bot completes a task when it encounters an error.

### Actions in the Error handler package

The **Error handler** package includes the following actions:

Action	Description
Try	<p>Enables you to specify a sequence of actions that might encounter an error. If the bot encounters an error from running the actions inside of the <b>Try</b> action, it attempts the actions inside of the <b>Catch</b> action.</p>
Catch	<p>Enables you to specify an alternative sequence of actions to run, and an optional contingency, if the bot encounters an error while running any of the actions in the <b>Try</b> action.</p> <p>You can assign an exception message or line number to a variable, and then insert the variable in a <b>Log to file</b>, <b>Message box</b>, or <b>Email &gt; Send</b> action. You can use the actions from the Screen package to capture a screenshot of a window or application when the error occurs.</p> <p>You can use the <b>Catch</b> action multiple times in a bot to handle various exceptions. This enables you to run a different set of actions based on the exception encountered.</p>

Action	Description
Finally	<p>Enables you to specify the actions that you want to run regardless if the bot encounters an error or not.</p> <p>The finally statement enables you to execute code after try and catch, regardless of whether an exception occurs or not.</p>
Throw	<p>Displays a custom message if the bot encounters an error. Specify the message you want to display in the <b>Please enter exception message</b> field.</p> <hr/> <p><b>Recommendation:</b> Use the <b>Throw</b> action within a Try block. In the <b>Catch</b> action, you can use variables such as <code>pStrErrorMessage</code> and <code>pNumErrorLineNumber</code> to assign the error message to the <b>Assign exception message to (optional)</b> field and the error line number to the <b>Assign line number to (optional)</b> field.</p>

## Using the actions in the Error handler package

In this example, you have a bot that reads data from a Microsoft Excel file and stores it in a database. The bot might encounter an error if the required file is not available or while updating a table in the database. Use the following methods to handle the errors:

- Exception 1:
  - The Microsoft Excel spreadsheet from which you want to extract data is not available.
  - **How to handle:** Use another file that contains the same data.
- Exception 2:
  - The table that you want to use to store the data is not available in the database.
  - **How to handle:** Display a message that the required table is not available.

Based on this example, perform the following to handle the mentioned exceptions:

1. Insert all the actions that are for reading the data from the Microsoft Excel spreadsheet and storing the extracted data into a table in the database within the **Try** action.
2. Insert the actions to run for the following exceptions within the **Catch** action:
  - a. Exception 1: Insert the actions to use the alternate file that contains the same data.
  - b. Exception 2: Insert the **Message box** action to display a relevant message.
3. Insert the **Database > Disconnect** action to terminate the connection with the database within the **Finally** action.

Regardless of whether the bot encounters an error or not, it must terminate the connection it established with the database.

Watch the following video on how to use the Error handler package:

## Excel basic package

The Excel basic package contains actions that enable you to automate many of the repetitive tasks in XLSX workbooks. You use these actions when Microsoft Excel is not available on the device that you want to use to automate Microsoft Excel-related tasks.

### Choosing the Excel package in Automation 360

Automation 360 includes packages to support three types of Microsoft Excel usage. For optimal results, use the package that corresponds to the type of Excel that is available on the device you are running bots on.

- **No Excel installed:** If you do not have Microsoft Excel installed on the device on which you are running bots to automate Excel-related processes, use the Excel basic package.
- **Desktop Excel installed:** If you have a desktop version of Microsoft Excel installed on your computer, use the Excel advanced package in your bots.
- **Online Office 365 Excel only:** If you are using Microsoft Excel 365 on a web browser, use the Office 365 Excel package for automating tasks related to Excel.

To learn more, search for the *Automating Excel Workbooks* course in [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#).

### Before you start

Perform the following actions within the Excel basic package as part of using the set of available actions:

1. Open the Microsoft Excel spreadsheet that you want to read data from using the **Open** action.

---

**Note:** The Excel basic package supports files that are a maximum size of 30 MB.

---

You must associate the details of the file you want to use with a session name, and use the session name in the other actions in the Excel basic package, so that you do not have to provide the details of the file in those actions again. See [Using the Open action for Excel](#).

2. Use the different actions available in the Excel basic package to automate the Microsoft Excel-related tasks.
3. After you have automated all the Microsoft Excel-related tasks, close the spreadsheet using the **Close** action.

### Actions in the Excel basic package

The Excel basic package includes the following actions:

Action	Description
Switch to sheet	<p>Switches to another sheet in a Microsoft Excel file.</p> <ul style="list-style-type: none"> <li>• Select the <b>Sheet by Index</b> (numerical value) or <b>Sheet by Name</b> option to specify how to activate the sheet.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

Action	Description
Close	<p>Closes the current workbook and provides an option to <b>Save changes</b> when closing the file. Enter the name of the session used to open the workbook with the <b>Open</b> action.</p> <hr/> <p><b>Note:</b> This action terminates the process for the session.</p>
Delete cell	<p>Deletes the <b>Active cell</b> or a <b>Specific cell</b> from the current worksheet or a CSV file.</p> <ul style="list-style-type: none"> <li>• Select the <b>Shift cells left</b> or <b>Shift cells up</b> option to specify whether to shift the cell one position to the left or up after the cell is deleted.</li> <li>• Select the <b>Entire row</b> or <b>Entire column</b> option to specify whether to delete the entire row or column of the cell.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Find	See <a href="#">Using Find action</a> .
Get cell address	<p>Retrieves the location of the active cell and stores it to a string variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• In the <b>Save the active cell address in local variable</b> field, create or insert an existing string variable.</li> </ul>
Get column name	<p>Retrieves the letter value of the column of the active or specific cell and stores it to a string variable.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option to specify whether to retrieve the column name from the active cell or a specific cell.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• In the <b>Save the column name into local variable</b> field, create or insert an existing string variable.</li> </ul>
Get multiple cells	<p>Retrieves the values from cells in a Microsoft Excel spreadsheet and stores them in a table variable.</p> <p>This action retrieves cell values as string data types. It supports Excel cell formats, including Number, Percentage, Currency, Scientific, and Date. For example, a value from a cell of Currency formatting retains the currency symbol when passed to a table or record variable.</p> <hr/> <p><b>Note:</b> You must convert the values to perform non-string operations.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the <b>Multiple cells</b> or <b>All cells</b> option to specify whether to retrieve the values from a range of cells or all the cells.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

Action	Description
Get row number	<p>Retrieves the row number of the active or specific cell and stores it to a string variable.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option to specify whether to retrieve the row number from the active cell or a specific cell.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• In the <b>Save the row number into local variable</b> field, create or insert an existing string variable.</li> </ul>
Get single cell	<p>Retrieves the values from a single cell in a Microsoft Excel spreadsheet or a CSV file and stores them in a string variable.</p> <p>This action retrieves cell values as string data types. It supports Excel cell formats, including Number, Percentage, Currency, Scientific, and Date. For example, a value from a cell of Currency formatting retains the currency symbol when passed to a table or record variable.</p> <hr/> <p><b>Note:</b> You must convert the values to perform non-string operations.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option to specify whether to retrieve the values from the active cell or a specific cell.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• In the <b>Store cell contents to</b> field, create or insert an existing string variable.</li> </ul> <p>You can use the output value to <a href="#">Example of using a conditional statement</a>.</p>
Go to cell	<p>Selects a specific cell in a Microsoft Excel spreadsheet or a CSV file.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option to specify which cell to select.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Open	<p>Reads data from a Microsoft Excel spreadsheet. See <a href="#">Using the Open action for Excel</a>.</p> <hr/> <p><b>Note:</b> This action does not open a Microsoft Excel spreadsheet. It only enables a task to read data from the spreadsheet.</p> <hr/>
Replace	See <a href="#">Using the Replace action</a> .
Save workbook	<p>Saves a Microsoft Excel spreadsheet to a specified location. Enter the name of the session used to open the workbook with the <b>Open</b> action.</p> <hr/> <p><b>Note:</b> When you open an excel file from the Control Room and make changes in the file, the updated file does not save in the Control Room. This action is supported only for Excel files opened from the desktop.</p> <hr/>
Set cell	<p>Sets the value you have specified in a cell in a Microsoft Excel spreadsheet. Select the <b>Active cell</b> or <b>Specific cell</b> option to specify whether to set the value in the active cell or a specific cell.</p>

Action	Description
Set session variable	<p>Assigns the session name to a variable.</p> <p>Use this action in a parent bot, and then insert the variable containing the session name in Excel-related actions in the child bot to associate the actions with the file opened in that session. When you run the bot, it passes the session variable to the child bot, which enables the child bot to process the data in the file opened in the parent bot.</p> <hr/> <p><b>Note:</b> The parent and child bots must use actions from the same Excel package version to pass the session variable.</p> <hr/> <p><i>Example of sharing an Excel session between bots</i></p>
Switch to sheet	<p>Activates a specific worksheet.</p> <ul style="list-style-type: none"> <li>• Select to activate the worksheet by the <b>Index</b> value or worksheet <b>Name</b>. The index is the numeric value assigned to the worksheet.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

## Excel advanced package

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

You can automate tasks related to the workbook, worksheet, rows, columns, and cell operations. You can use these actions when Microsoft Excel is installed on the device that you want to use to automate the Microsoft Excel-related tasks.

---

**Note:** The excel file that you use from the Control Room is applicable only for the current bot session. If you modify the file during bot execution, the updated file cannot be uploaded back to the Control Room.

---

Actions in the Excel advanced package support Microsoft Office 2016 through Microsoft Office 2019, Microsoft Office 365, and .xls, .xlsx, .xlsb, and .xlsm formats. You can also use some of the actions with the .csv format. See [CSV operations](#).

See [Example of migrating data from Excel to a database](#).

## Choosing the Excel package in Automation 360

Automation 360 includes packages to support three types of Microsoft Excel usage. For optimal results, use the package that corresponds to the type of Excel that is available on the device you are running bots on.

- **No Excel installed:** If you do not have Microsoft Excel installed on the device on which you are running bots to automate Excel-related processes, use the Excel basic package.
- **Desktop Excel installed:** If you have a desktop version of Microsoft Excel installed on your computer, use the Excel advanced package in your bots.
- **Online Office 365 Excel only:** If you are using Microsoft Excel 365 on a web browser, use the Office 365 Excel package for automating tasks related to Excel.

## Before you start

Perform the following actions within the Excel advanced package as part of using the set of available actions:

1. Open the Microsoft Excel spreadsheet that you want to use to automate the Microsoft Excel-related tasks. Use the **Open** action to open the spreadsheet. See [Using the Open action for Excel](#).

---

**Note:** For files containing large data sets, use actions from the Database package to automate create, read, and update operations. See [Using Connect action for database](#).

---

2. Use the different actions available in the Excel advanced package to automate the Microsoft Excel-related tasks.
3. After you have automated all the Microsoft Excel-related tasks, close the spreadsheet using the **Close** action.

## Actions in the Excel advanced package

The actions in the Excel advanced package enable you to perform the following operations:

Action	Description
Cell operations	Perform operations such as extracting data from cells, deleting values from a cell, moving a cursor to a specific cell, and finding and replacing content. See <a href="#">Cell operations</a> .
Row and column operations	Perform operations such as inserting new rows and columns, and hiding and unhiding rows and columns. See <a href="#">Row and column operations</a> .
Table operations	Perform operations such as sorting and filtering data in a table, inserting and deleting columns, and getting the table range. See <a href="#">Table operations</a> .
Workbook operations	Perform operations such as opening a workbook, appending data, protecting and unprotecting a workbook, and converting a Microsoft Excel workbook to a PDF file. See <a href="#">Workbook operations</a> .
Worksheet operations	Perform operations such as creating and deleting a worksheet, appending data, and hiding and unhiding a worksheet. See <a href="#">Worksheet operations</a> .

---

### Example tasks:

- [Example of transferring data from CSV file to Excel worksheet](#)
- [Example of using a conditional statement](#)

---

Watch the following video on how to use the Excel advanced package:

## More resources

- Free Automation 360 bot examples for Excel from Bot Store:
  - [Merge Excel Sheets Example](#)
  - [Convert XML to Excel](#)
  - [Convert multiple Excel files to CSV files](#)
- Tutorial on using Excel packages: [Work with large Excel datasets in a bot](#)
- Training course [Automating Excel Workbooks - Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#)

## Related tasks

### Using Find action

Use the **Find** action to find a particular string in a Microsoft Excel spreadsheet or a CSV file.

## Workbook operations

A workbook is a file that contains one or more worksheets. The **Excel advanced** package contains various actions that you can use to automate workbook-related tasks.

## Workbook actions in the Excel advanced package

The **Excel advanced** package includes the following actions:

Action	Description
Append workbook	<p>Adds all the worksheets from the specified workbook to the end of the currently open workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Specify the workbook from which you want to append the worksheets in the <b>Append from workbook</b> field.</li> <li>• If the workbook is protected, select the <b>Password is required</b> check box and enter the password in the <b>To open</b> field.</li> </ul>
Close	<p>Closes the current workbook and provides an option to <b>Save changes</b> when closing the file. Enter the name of the session used to open the workbook with the <b>Open</b> action.</p>
Convert excel to PDF	<p>Converts the entire workbook, specific worksheets in a workbook, or a CSV file to a PDF file.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Specify whether you want to convert the <b>Entire excel file</b>, <b>Active sheet</b>, or <b>Specific sheet</b> to a PDF file.</li> <li>• Enter a name for the PDF file in the <b>Select PDF file name</b> field.</li> <li>• Specify the location where you want to save the file in the <b>Select PDF storage location</b> field.</li> </ul>

Action	Description
Create workbook	<p>Creates a Microsoft Excel workbook or a CSV file.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Specify the location where you want to save the workbook in the <b>File path</b> field.</li> <li>Specify the name of the worksheet and passwords to open and edit the workbook.</li> </ul>
Open	See <a href="#">Using the Open action for Excel</a> .
Protect workbook	<p>Protects the workbook and its structure using a password. Protecting a workbook prevents other users from opening the workbook without the password, and protecting the structure of a workbook prevents other users from adding, moving, deleting, hiding, and renaming worksheets within that workbook.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select the <b>Protect workbook</b> and <b>Protect workbook structure</b> check boxes and provide a password in the respective fields.</li> </ul>
Save workbook	<p>Saves the current workbook. Enter the name of the session used to open the current workbook with the <b>Open</b> action.</p> <hr/> <p><b>Note:</b> When you open an excel file from the Control Room and make changes in the file, the updated file does not save in the Control Room This action is supported only for Excel files opened from the desktop.</p> <hr/>
Set session variable	<p>Assigns the session name to a variable.</p> <p>Use this action in a parent bot, and then insert the variable containing the session name in Excel-related actions in the child bot to associate the actions with the file opened in that session. When you run the bot, it passes the session variable to the child bot, which enables the child bot to process the data in the file opened in the parent bot.</p> <hr/> <p><b>Note:</b> The parent and child bots must use actions from the same Excel package version to pass the session variable.</p> <hr/> <p><a href="#">Example of sharing an Excel session between bots</a></p>

Action	Description
Unprotect workbook	<p>Unprotects a workbook and its structure. Unprotecting a workbook removes the restriction applied on opening the workbook, and unprotecting the structure of a workbook removes the restriction applied on modifying the structure of the workbook. Unprotecting allows other users to open the workbook, add, move, delete, hide, and rename worksheets within the workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Unprotect workbook</b> and <b>Unprotect workbook structure</b> check boxes and provide a password to unprotect the workbook structure.</li> </ul>

### *Using the Open action for Excel*

Use the **Open** action to open a Microsoft Excel spreadsheet or a CSV file. This action enables you to specify whether to open the spreadsheet in read-only mode or read-write mode, a password to open the spreadsheet, and so on.

To open a Microsoft Excel spreadsheet, do the following:

1. Double-click or drag the **Open** action from the **Excel** node in the **Actions** palette.
2. Select from where you want to open the Microsoft Excel spreadsheet:

---

**Note:** The Excel basic package supports files that are a maximum size of 30 MB.

---

- **Control Room file:** Enables you to open a file from the Control Room.
  - **Desktop file:** Enables you to open a file from the device. This field also accepts the file path input as a string variable or global value.
  - **Variable:** Enables you to open a file by specifying a file variable.
3. Select the **Sheet contains a header** check box if the Microsoft Excel spreadsheet contains a header row.
  4. Select the **Specific sheet name** option and specify the name of the sheet to activate when the Microsoft Excel spreadsheet opens.
  5. Select **Read-only mode** or **Read-write mode** to open the Microsoft Excel spreadsheet in read-only or edit mode respectively.
  6. Select the **Password is required** check box if a password is required to open or edit the Microsoft Excel spreadsheet.
  7. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.
    - **User password:** Allow users to perform specific operations on the encrypted PDF file.
    - **Owner password:** Allow users to use a password to open the file.
  8. Select the **Load Add-ins** check box if you want to load the add-ins available in the Microsoft Excel spreadsheet.
  9. Enter the name of the session used to open the workbook with the **Open** action.
  10. Click **Save**.

## Worksheet operations

The **Excel advanced** package contains various actions that you can use to automate worksheet-related tasks.

### Worksheet actions in the Excel advanced package

The **Excel advanced** package includes the following actions:

Action	Description
Access password protected worksheet	<p>Accesses a password-protected worksheet in the current workbook.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Enter the password to access the worksheet.</li> </ul>
Append worksheet	See <a href="#">Using Append worksheet action</a> .
Create worksheet	<p>Creates a worksheet in the current workbook.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Specify either an index number in the <b>Sheet by Index</b> field or a name in the <b>Sheet by Name</b> field for the worksheet. The index number is the number assigned to a worksheet. For example, if you want to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.</li> </ul>
Delete worksheet	<p>Deletes a spreadsheet from the current workbook.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Specify either an index number in the <b>Sheet by Index</b> field or a name in the <b>Sheet by Name</b> field for the worksheet. The index number is the number assigned to a worksheet. For example, if you want to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.</li> </ul> <hr/> <p><b>Note:</b> You can delete a worksheet only if the workbook contains more than one worksheet.</p> <hr/>
Get current worksheet name	<p>Gets the name of the current worksheet and assigns it to a string variable.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select a string variable that you want to use to store the name of the worksheet from the <b>Assign the output to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>

Action	Description
Get worksheet as data table	<p>Gets data from a worksheet and saves it in a table variable.</p> <ul style="list-style-type: none"> <li>• Specify either an index number in the <b>Sheet by Index</b> field or a name in the <b>Sheet by Name</b> field for the worksheet. The index number is the number assigned to a worksheet. For example, if you want to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.</li> <li>• Choose from the <b>Read</b> option to read either the visible text or value of the cell.</li> </ul> <p>For example, if the cell has 70% as cell content, <b>Read cell value</b> option will read the value as 70 ignoring the % format whereas <b>Read visible text</b> option will read the content as 70%.</p> <hr/> <p><b>Recommendation:</b> Use option <b>Read cell value</b> as reading value from a cell gives better performance than reading a visible text.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a table variable that you want to use to store the data from the worksheet from the <b>Assign value to the variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Get worksheet names	<p>Gets the names of all the worksheets and assigns them to a list variable of string data type.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a string variable that you want to use to store the name of the worksheet from the <b>Assign the output to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Hide worksheet	<p>Hides a worksheet from the current workbook.</p> <ul style="list-style-type: none"> <li>• Specify the name of the worksheet to hide in the <b>Enter worksheet name to hide</b> field.</li> </ul> <hr/> <p><b>Note:</b> You can hide a worksheet only if the workbook contains more than one worksheet.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

Action	Description
Password protect worksheet	<p>Protects a worksheet with a password. You can also specify the operations to restrict on the worksheet.</p> <ul style="list-style-type: none"> <li>Specify the password you want to use to protect the worksheet and select the check boxes for the operation that you want to restrict on the worksheet. For example, select the <b>Delete row</b> and <b>Delete column</b> check boxes to restrict a user from deleting a row or column from the worksheet.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Rename worksheet	<p>Renames a worksheet in the current workbook.</p> <ul style="list-style-type: none"> <li>Specify the index number or name of the worksheet to rename in the <b>Sheet by Index</b> or <b>Sheet by Name</b> field.</li> </ul> <p>The index number is the number assigned to a worksheet. For example, if you want to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.</p> <hr/> <p><b>Note:</b> You cannot rename the worksheet if a worksheet with the same name already exists in the workbook.</p> <hr/> <ul style="list-style-type: none"> <li>Enter the new worksheet name that is under 31 characters.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Retrieve sheets count	<p>Gets the number of sheets available in the current workbook and stores it in a number variable.</p> <ul style="list-style-type: none"> <li>Select the appropriate option to specify whether to include the hidden worksheet or not and assign the count to a variable.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select a number variable that you want to use to store the name of the worksheet from the <b>Select the variable to assign to</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Run macro	<p>Runs a macro in a worksheet.</p> <ul style="list-style-type: none"> <li>Specify the name of the macro you want to run and its arguments.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Switch to sheet	<p>Activates a particular sheet in a Microsoft Excel file.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Specify whether to activate the <b>Sheet by Index</b> (numerical value) or <b>Sheet by Name</b>.</li> </ul>

Action	Description
Unhide all worksheets	Unhides all worksheets in the current workbook. Enter the name of the session used to open the current workbook with the <b>Open</b> action.
Unhide worksheet	Unhides a specific worksheet in the current workbook. <ul style="list-style-type: none"> <li>• Enter the name of the worksheet you want to unhide.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Write from data table	Write values from a data table into a worksheet. <ul style="list-style-type: none"> <li>• Specify the data table variable that contains the data you want to write in a worksheet.</li> <li>• Specify whether you want to write data in the currently <b>Active worksheet</b> or <b>Specific worksheet</b>.</li> <li>• Specify the address of the cell that you want to use as the starting point of the data in the <b>Specify the first cell</b> field.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

#### *Using Append worksheet action*

Use the **Append worksheet** action to append a worksheet from another workbook to the current workbook.

---

**Note:** If the current workbook already has a worksheet with the same name, you must rename the worksheet being appended.

---

To append a worksheet, do the following:

1. Double-click or drag the **Append worksheet** action from the **Excel** node in the **Actions** palette.
2. Select an option to specify the location of the spreadsheet from which you want to append the worksheet:
  - **From 'My bots'**: Enables you to open a Microsoft Excel spreadsheet from an existing bot.
  - **From local device**: Enables you to open a Microsoft Excel spreadsheet from a local device.
  - **Select an existing file variable**: Enables you to open a Microsoft Excel spreadsheet using a file variable.
3. Select the **Password is required** option if the Microsoft Excel spreadsheet requires a password to open it.
4. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.
  - **User password**: Allow users to perform specific operations on the encrypted PDF file.
  - **Owner password**: Allow users to use a password to open the file.
5. Select the **Enter worksheet name** or **Enter worksheet index** option to specify the name or number of the worksheet that you want to append.
6. Enter the name of the session used to open the workbook with the **Open** action.
7. Click **Save**.

## Row and column operations

The **Excel advanced** package contains various actions that you can use to automate tasks related to the row and column operations in a Microsoft Excel spreadsheet.

### Row and column actions in the Excel advanced package

The **Excel advanced** package includes the following actions:

Action	Description
Get column name	<p>Retrieves the column name that contains the specific cell and stores it to a string variable. This action supports .xlsx and .xlsm files.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option to specify the cell location.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a string variable from the <b>Save the column name to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Get row number	<p>Retrieves the row number that contains the specific cell and stores it to a string variable. This action supports .xlsx and .xlsm files.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option to specify the cell location.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a string variable from the <b>Save the row number to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Hide rows/columns in selection	<p>Hides rows or columns in the current worksheet.</p> <ul style="list-style-type: none"> <li>• Select the appropriate option to specify whether to hide one or more rows and columns.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Insert/Delete Rows/Columns	See <a href="#">Using Insert or Delete actions for rows and columns</a> .

Action	Description
Read column	<p>Extracts data from a column and stores it in a list variable of string data type.</p> <ul style="list-style-type: none"> <li>• Select the <b>From active cell</b> or <b>From specific cell</b> option to specify the starting point. You can also select the <b>Read full column</b> option to extract data for the entire column.</li> <li>• Choose from the <b>Read</b> option to read either the visible text or value of the cell.</li> </ul> <p>For example, if the cell has 70% as cell content, <b>Read cell value</b> option will read the value as 70 ignoring the % format whereas <b>Read visible text</b> option will read the content as 70%.</p> <hr/> <p><b>Recommendation:</b> Use the <b>Read cell value</b> option as reading value from a cell for better performance than reading visible text.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a table variable to store the extracted values.</li> </ul> <hr/> <p><b>Note:</b> This action overwrites any existing values in the selected table.</p> <hr/> <p>The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</p>
Read row	<p>Extracts data from a row and stores it in a list variable of string data type.</p> <ul style="list-style-type: none"> <li>• Select the <b>From active cell</b> or <b>From specific cell</b> option to specify the starting point. You can also select the <b>Read full row</b> option to extract data for the entire row.</li> <li>• Choose from the <b>Read</b> option to read either the visible text or value of the cell.</li> </ul> <p>For example, if the cell has 70% as cell content, <b>Read cell value</b> option will read the value as 70 ignoring the % format whereas <b>Read visible text</b> option will read the content as 70%.</p> <hr/> <p><b>Recommendation:</b> Use option <b>Read cell value</b> as reading value from a cell gives better performance than reading a visible text.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a list variable of string data type that you want to use to store the extracted values. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Remove blank rows	Removes blank rows from the current worksheet. You can specify the range from which you want to delete the blank rows.
Select cell(s)/row(s)/column(s)	See <a href="#">Using Select action for cells, rows, and columns</a> .

Action	Description
Unhides rows/columns in selection	<p>Unhides the hidden rows or columns in the current worksheet.</p> <ul style="list-style-type: none"> <li>• Select the appropriate option to specify whether you want to unhide a row or column and which row or column to unhide.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

#### *Using Insert or Delete actions for rows and columns*

Use the **Insert** or **Delete** actions to create or remove rows or columns from the current worksheet or CSV file.

To insert or delete rows or columns in a worksheet, do the following:

1. Double-click or drag the **Insert** or **Delete** action from the **Excel** node in the **Actions** palette.
2. Select the **Row operations** if you want to insert or delete rows from the spreadsheet.
  - a) Select the **Insert Row at** option to insert a row and specify the location where you want to insert the row in the field.
  - b) Select the **Delete Row(s) at** option to delete rows. You must specify the row number you want to delete in the field. For example, if you want to delete the tenth row in the worksheet, you must enter 10 in the field. If you want to delete the first five rows, you must enter 1 : 5 in the field.
3. Select the **Column operations** if you want to insert or delete columns from the spreadsheet.
  - a) Select the **Insert Column at** option to insert a column and specify the location where you want to insert the column in the field.
  - b) Select the **Delete Column(s) at** option to delete columns. You must specify the address of the column you want to delete in the field. For example, if you want to delete column 'D' in the worksheet, you must enter D in the field. If you want to delete the first five columns, you must enter A : E in the field.
4. Enter the name of the session used to open the workbook with the **Open** action.
5. Click **Save**.

#### *Using Select action for cells, rows, and columns*

Use the **Select** action to select cells, rows, or columns.

To select cells, rows, or columns do the following:

1. Double-click or drag the **Select** cell, row, or column action from the **Excel** node in the **Actions** palette.

2. Select an option from the **Select** list to specify whether you want to select a cell, row, or column.
  - a) If you have selected the **Cell** option, select any of the following options:
    - **Active cell:** Enables you to select the active cell from the worksheet.
    - **Specific cell:** Enables you to select the cell you have specified in the field.
    - **Cell range:** Enables you to select all the cells in the range you have specified in the field.
    - **All cells in the sheet:** Enables you to select all the cells in the worksheet.
  - b) If you have selected the **Column** option, select any of the following options:
    - **Column of active cell:** Selects the column of the current active cell in the worksheet.
    - **Specific column:** Enables you to select the column you have specified in the field.
    - **Column range:** Enables you to select all the columns in the range you have specified in the field.
  - c) If you have selected the **Row** option, select any of the following options:
    - **Row of active cell:** Selects the row of the current active cell in the worksheet.
    - **Specific row:** Enables you to select the row you have specified in the field.
    - **Row range:** Enables you to select all the rows in the range you have specified in the field.
3. Enter the name of the session used to open the workbook with the **Open** action.
4. Click **Save**.

## Cell operations

The **Excel advanced** package contains various actions that you can use to automate tasks related to cell operations.

### Cell actions in the Excel advanced package

The **Excel advanced** package includes the following actions:

Action	Description
Delete cells	<p>Deletes the <b>Active cell</b> or a <b>Specific cell</b> from the current worksheet or a CSV file.</p> <hr/> <p><b>Note:</b> You can enter a cell range in the <b>Specific - cell</b> field using the <code>starting - cell:ending cell</code> format. For example, to perform this operation on all cells in the second row and from the first through third column, enter <code>A2:C2</code>.</p> <hr/> <p>After deleting the cell, you can:</p> <ul style="list-style-type: none"> <li>• <b>Shift cells left:</b> Deletes the specified cell and shifts the cell one position to the left.</li> <li>• <b>Shift cells up:</b> Deletes the specified cell and shifts the cell one position up.</li> <li>• <b>Entire row:</b> Deletes the entire row that contains the cell you have specified to delete.</li> <li>• <b>Entire column:</b> Deletes the entire column that contains the cell you have specified to delete.</li> </ul>

Action	Description
Find next empty cell	See <a href="#">Using Find next empty cell action.</a>
Find	See <a href="#">Using Find action.</a>
Get cell address	Retrieves the location of the active cell and stores it to a string variable. This action supports .xlsx and .xlsm files. See <a href="#">Using the Get cell address action</a>
Get cell color	See <a href="#">Using Get cell color action.</a>
Get multiple cells	<p>Retrieves the values from the cells in a Microsoft Excel spreadsheet and stores them in a table variable.</p> <p>This action retrieves cell values as string data types. It supports Excel cell formats, including Number, Percentage, Currency, Scientific, and Date. For example, a value from a cell of Currency formatting retains the currency symbol when passed to a table or record variable.</p> <hr/> <p><b>Note:</b> You must convert the values to perform non-string operations.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the <b>Multiple cells</b> option to retrieve values from a range of cells, or select <b>All cells</b> to retrieve values from all the cells.</li> <li>• Choose from the <b>Read</b> option to read either the visible text or value of the cell.</li> </ul> <p>For example, if the cell has 70% as cell content, <b>Read cell value</b> option will read the value as 70 ignoring the % format whereas <b>Read visible text</b> option will read the content as 70%.</p> <hr/> <p><b>Recommendation:</b> Use the <b>Read cell value</b> option as the reading value for a better performance than reading visible text.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a table variable to store the retrieved values in the <b>Assign value to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Get number of rows	See <a href="#">Using Get number of rows action.</a>

Action	Description
Get single cell	<p>Retrieves the values from a single cell in a Microsoft Excel spreadsheet or a CSV file and stores them in a string variable.</p> <p>This action retrieves cell values as string data types. It supports Excel cell formats, including Number, Percentage, Currency, Scientific, and Date. For example, a value from a cell of Currency formatting retains the currency symbol when passed to a table or record variable.</p> <hr/> <p><b>Note:</b> You must convert the values to perform non-string operations.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> option to retrieve the value from the active cell, or select <b>Specific cell</b> to retrieve the value from a specific cell in a Microsoft Excel spreadsheet.</li> <li>• Choose from the <b>Read</b> option to read either the visible text or value of the cell.</li> </ul> <p>For example, if the cell has 70% as cell content, <b>Read cell value</b> option will read the value as 70 ignoring the % format whereas <b>Read visible text</b> option will read the content as 70%.</p> <hr/> <p><b>Recommendation:</b> Use the <b>Read cell value</b> option as the reading value from a cell for a better performance than reading visible text.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a string variable to store the retrieved values in the <b>Store cell contents to</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul> <p><i>Example of using a conditional statement.</i></p>
Go to cell	<p>Moves the cursor to a specific cell in a Microsoft Excel spreadsheet or a CSV file.</p> <ul style="list-style-type: none"> <li>• Select the <b>Specific cell</b> option to specify the cell to which the cursor should be moved, or select an option from the <b>Active cell</b> list.</li> </ul> <hr/> <p><b>Note:</b> You can enter a cell range in the <b>Specific cell</b> field to select the entire range of cells. For example, to select all the cells in the second row and from the first through third column, enter A2 : C2.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

Action	Description
Go to next empty cell	<p>Finds the next empty cell in the current worksheet. You can specify whether to find the empty cell toward the left, right, up, or down.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell from which to start searching for the empty cell. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>• Select the <b>left, right, up, or down</b> option to specify the direction in which to search for the next empty cell.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Read cell formula	<p>Gets the formula available in the <b>Active cell</b> or <b>Specified cell</b> and assigns the output to a string variable. This action returns a blank value if the specified cell does not contain a formula.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell from which to read the formula. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>• Select a string variable to store the name of the formula from the <b>Assign the output to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Replace	See <a href="#">Using the Replace action</a> .
Set cell	<p>Sets a value in the <b>Active cell</b> or <b>Specific cell</b> in a Microsoft Excel spreadsheet or a CSV file. You can also use this action to set a formula.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell in which to set the value. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> </ul> <hr/> <p><b>Note:</b> You can enter a cell range in the <b>Specific cell</b> field to set a particular value in all the cells of the range. For example, to set a value of 5 on all cells in the second row and from the first through third column, enter <code>A2 : C2</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the value to set in the <b>Cell value</b> field.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

Action	Description
Set cell formula	<p>Sets a formula in the active cell or a specific cell in a Microsoft Excel spreadsheet or a CSV file. To generate a random number, use the <b>Number &gt; Random</b> action. See <a href="#">Random action</a>.</p> <ul style="list-style-type: none"> <li>• Select the <b>Set formula for active cell</b> or <b>Set formula for specified cell</b> option to specify the cell in which to set the formula. If you have selected the <b>Set formula for specified cell</b> option, specify the address of the cell in the field.</li> <li>• Enter the formula to set in the <b>Enter formula for specific cell</b> field.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

### Using Find action

Use the **Find** action to find a particular string in a Microsoft Excel spreadsheet or a CSV file.

To find a value in a Microsoft Excel spreadsheet, do the following:

1. Double-click or drag the **Find** action from the **Excel** node in the **Actions** palette.
2. Select an option from the **From** list to specify a starting point of the cell range for search:
  - **Beginning**: Starts the search from the beginning of the spreadsheet.
  - **End**: Starts the search from the end of the spreadsheet.
  - **Active cell**: Starts the search from the active cell in the spreadsheet.
  - **Specific cell**: Enables you to specify the address of the cell from where you want to start the search.
3. Select an option from the **Till** list to specify an end point of the cell range for search:
  - **Beginning**: Ends the search at the beginning of the spreadsheet.
  - **End**: Ends the search at the end of the spreadsheet.
  - **Active cell**: Ends the search at the active cell in the spreadsheet.
  - **Specific cell**: Enables you to specify the address of the cell where you want to end the search.
4. Specify the string you want to search for in the **Find** field.
5. Select from the following search options:
  - **By rows**: Enables you to search by rows.
  - **By columns**: Enables you to search by columns.
  - **Match by case**: Only performs this action on cells that contain a string that matches the uppercase and lowercase characters of the string you specified in the **Find** field.
  - **Match entire cell contents**: Enables you to find only those cells that contain the entire string you have specified in the **Find** field.
6. Select the list variable of string data type that you want to use to store the output from the **Assign cell addresses variable** list.
7. Enter the name of the session used to open the workbook with the **Open** action.
8. In the **Assign value to variable** list, select a string variable.

The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.
9. Click **Save**.

*Using the Replace action*

Use the **Replace** action to find cells that contain a specific string and replace it with another string. This action supports .xlsx, .xlsm, and .csv files.

1. Double-click or drag the **Replace** action from the Excel advanced node in the **Actions** palette.
2. Select an option from the **From** list to specify a starting point of the cell range for search:
  - **Beginning**: Starts the search from the beginning of the spreadsheet.
  - **End**: Starts the search from the end of the spreadsheet.
  - **Active cell**: Starts the search from the active cell in the spreadsheet.
  - **Specific cell**: Enables you to specify the address of the cell from where you want to start the search.
3. Select an option from the **Till** list to specify an end point of the cell range for search:
  - **Beginning**: Ends the search at the beginning of the spreadsheet.
  - **End**: Ends the search at the end of the spreadsheet.
  - **Active cell**: Ends the search at the active cell in the spreadsheet.
  - **Specific cell**: Enables you to specify the address of the cell where you want to end the search.
4. Specify the string you want to search for in the **Find** field.
5. Select from the following search options:
  - **By rows**: Enables you to search by rows.
  - **By columns**: Enables you to search by columns.
  - **Match by case**: Only performs this action on cells that contain a string that matches the uppercase and lowercase characters of the string you specified in the **Find** field.
  - **Match entire cell contents**: Enables you to find only those cells that contain the entire string you have specified in the **Find** field.
6. Select **Replace with** and specify the replacement string.
7. Select **Replace with** and specify the replacement string, or leave the field blank to replace the matching cells with an empty character.
8. Enter the name of the session used to open the workbook with the **Open** action.
9. Click **Save**.

*Using Find next empty cell action*

Use the **Find next empty cell** action to find the next empty cell in the current worksheet.

To find the next empty cell, do the following:

1. Double-click or drag the **Find next empty cell** action from the **Excel** node in the **Actions** palette.
2. Select the **row** or **column** option from the **Traverse by** section to specify whether you want to find the empty cell in a row or column.
3. Select the **active cell** or **specific cell** option from the **Start from** section to specify the point from where you want to start the search.
4. Select the string variable you want to use to store the address of the empty cell from the **Assign the output to variable** list.
 

The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.
5. Enter the name of the session used to open the workbook with the **Open** action.
6. Click **Save**.

*Using Get cell color action*

Use the **Get cell color** action to get the color of the background or text in a cell. This action retrieves the color of a cell as RGB values. For example, if the background or text in a cell is of red color, the value retrieved is 255,0,0.

To get the color of the background or text in a cell, do the following:

1. Double-click or drag the **Get cell color** action from the **Excel** node in the **Actions** palette.
2. Select the **Background color** option to get the background color of the cell or the **Text color** option to get the color of the text.
3. Select the **Active cell** option to get the color from the current active cell or the **Specific cell** option to get the color from the address of the cell you have specified.
4. Select a variable from the **Assign the output to variable** list to assign the address of the empty cell to the variable you have selected from the list.
5. Select the string variable you want to use to store the address of the empty cell from the **Assign the output to variable** list.  
The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.
6. Enter the name of the session used to open the workbook with the **Open** action.
7. Click **Save**.

*Using the Get cell address action*

Use the Get cell address action to retrieve the location of the active cell and store it to a string variable. This action supports .xlsx and .xlsm files.

Open a worksheet using the **Open** action. You must select the **Contains header** option when configuring the **Open** action in order to use this action to retrieve the cell address based on the column title name.

1. Double-click or drag the **Get cell address** action from the Excel advanced node in the **Actions** palette.
2. Select whether to retrieve the cell address from the **Active cell** or **Based on header**:

Option	Steps
<b>Active cell</b>	If you select this option, the bot will retrieve the cell address of the currently active cell. Skip to Step 5.

Option	Steps
<p><b>Based on header</b></p>	<p>If you select this option, the bot will retrieve the cell address of the cell specified by the column title name and cell position. Complete the following fields:</p> <p><b>a. Enter the column title:</b> If you selected the <b>Sheet contains header</b> option when you opened this sheet using the <b>Open</b> action, enter the column name. For example, <i>First Name</i>.</p> <p>If you did not select that option, enter the default column name. For example, <i>A</i>.</p> <hr/> <p><b>Note:</b> This field is not case-sensitive.</p> <hr/> <p><b>b. Enter cell position from column title:</b> Enter the number of cells between the header cell and the cell from which you want to retrieve the address. Enter up to three digits.</p> <p>For example, if the header cell is located at B1 and you specify 2 as the cell position, the action will return B3.</p>

**3.** Select whether to retrieve the cell address from the **Active cell** or a **Specific cell**.

- If you have selected the **Active cell** option, the bot will retrieve the cell address of the currently active cell. Skip to Step 5.
- If you have selected the **Specific cell** option, the bot will retrieve the cell address of the cell specified by the column title name and cell position. Complete the following fields:

- **Enter the column title:** Enter the column name. For example, *Name*.

---

**Note:** This field is not case-sensitive.

---

- **Enter cell position from column title:** Enter the number of cells between the header cell and the cell from which you want to retrieve the address. Enter up to three digits.

For example, if the header cell is located at B1 and you specify 2 as the cell position, the action will return B3.

**4.** In the **Save active or user specified cell address in local variable** field, create or insert an existing string variable.

The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a *-1*, *-2*, *-3*, and so on to avoid duplication.

- 5.** Enter the name of the session used to open the workbook with the **Open** action.
- 6.** Click **Save**.

Next, you can insert the string variable containing the cell address into the **Specific cell** field of actions related to cell operations. See [Cell operations](#).

*Using Get number of rows action*

Use the **Get number of rows** action to get the number of rows that contain data.

To get the number of rows that are not empty or contain data, do the following:

1. Double-click or drag the **Get number of rows** action from the **Excel** node in the **Actions** palette.
2. Select the **Index** option to specify the number of the worksheet or the **Name** option to specify the name of the worksheet from which you want to get the number or rows.
3. Select the **Non-empty rows** option to get the number of rows that are not empty or the **Total rows with data** option to get the number of rows that contain data.
4. Enter the name of the session used to open the workbook with the **Open** action.
5. Select the number variable you want to use to store the output from the **Assign to variable** list.
6. Click **Save**.

## Table operations

The **Excel advanced** package contains various actions that you can use to automate tasks related to table operations in a Microsoft Excel spreadsheet.

### Table actions in the Excel advanced package

---

**Note:** Ensure that a table is available in the workbook. A worksheet that contains data in various rows and columns is not considered as a table.

---

The **Excel advanced** package includes the following actions:

Action	Description
Delete table column	<p>Deletes a column in a table.</p> <ul style="list-style-type: none"> <li>• Specify the <b>Table name</b> from which you want to delete a column.</li> </ul> <hr/> <p><b>Note:</b> The table name is a string value. It is NOT a data table name. For information on how to retrieve the Excel table name, see <a href="#">Rename an Excel table</a>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the <b>Name</b> or <b>Position</b> to specify the name or position of the column to delete.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Filter table	See <a href="#">Using Filter table action</a> .

Action	Description
Get table range	<p>Gets the range of a table available in a worksheet and stores the output in a string variable.</p> <ul style="list-style-type: none"> <li>Specify the <b>Table name</b> for which you want to get the range.</li> </ul> <hr/> <p><b>Note:</b> The table name is a string value. It is NOT a data table name. For information on how to retrieve the Excel table name, see <a href="#">Rename an Excel table</a>.</p> <hr/> <ul style="list-style-type: none"> <li>Select the options to specify whether you want to include a header and pivot table in the range and a variable to store the output. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Insert table column	<p>Inserts a column in a table.</p> <ul style="list-style-type: none"> <li>Specify the <b>Table name</b> in which you want to insert a column.</li> </ul> <hr/> <p><b>Note:</b> The table name is a string value. It is NOT a data table name. For information on how to retrieve the Excel table name, see <a href="#">Rename an Excel table</a>.</p> <hr/> <ul style="list-style-type: none"> <li>Specify the name of the column in the <b>Column name</b> field and the position where you want to insert the column in the <b>Column position</b> field.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Sort table	<p>Sorts the data in a column of a table. This action enables you to sort numeric and text data.</p> <ul style="list-style-type: none"> <li>Specify the <b>Table name</b> for which you want to sort the data.</li> </ul> <hr/> <p><b>Note:</b> The table name is a string value. It is NOT a data table name. For information on how to retrieve the Excel table name, see <a href="#">Rename an Excel table</a>.</p> <hr/> <ul style="list-style-type: none"> <li>Select the <b>Column name</b> or <b>Column position</b> to specify the name or position of the column.</li> <li>Select an appropriate option from the <b>Number</b> or <b>Text</b> list to specify the sort order.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>

#### Using Filter table action

Use the **Filter table** action to filter data from a column in a table.

To filter data in a table, do the following:

1. Double-click or drag the **Filter table** action from the **Excel** node in the **Actions** palette.

2. Specify the name of the table from which you want to filter data in the **Table name** field.

---

**Note:** The table name is a string value. It is NOT a data table name. For information on how to retrieve the Excel table name, see [Rename an Excel table](#).

---

3. Select the **Column name** to specify the name of the column or the **Column position** to specify the position of the column that contains the data you want to filter.
4. Select the **Number** option if the column you have specified contains number data.

- a) Select an option from the list to specify the operator you want to use to filter the data.

The following options are available:

- **Equals:** Filters the data that is equal to the value you have specified.
- **Does not equal:** Filters the data that is not equal to the value you have specified.
- **Greater than:** Filters the data that is greater than the value you have specified.
- **Greater than or equal to:** Filters the data that is greater than or equal to the value you have specified.
- **Less than:** Filters the data that is less than the value you have specified.
- **Less than or equal to:** Filters the data that is less than or equal to the value you have specified.
- **Between:** Filters the data that is between the two values you have specified.

---

**Note:** Apart from the **Between** option, you do not have to provide a value in the second field. If you have provided a value in the second field, the system ignores that value when filtering the data.

---

5. Select the **Text** option if the column you have specified contains textual data.

- a) Select an option from the list to specify the operator you want to use to filter the data.

The following options are available:

- **Equals:** Filters the data that is equal to the value you have specified.
- **Does not equal:** Filters the data that is not equal to the value you have specified.
- **Begins with:** Filters the data that begins with the value you have specified.
- **Ends with:** Filters the data that ends with the value you have specified.
- **Contains:** Filters the data that contains the value you have specified.
- **Does not contain:** Filters the data that does not contain the value you have specified.

6. Enter the name of the session used to open the workbook with the **Open** action.

7. Click **Save**.

## CSV operations

You can use some of the actions available in the **Excel advanced** package to perform various operations on a CSV file.

### CSV actions in the Excel advanced package

The following table lists the actions that you can use with a CSV file:

Supported	Not Supported
Open	Find next empty cell

Set cell	Get cell colour
Go to cell	Go to next empty cell
Insert/Delete row column	Run macro
Insert/Delete row column	Unhide all worksheets
Get cell	Hide row/column in selection
Find/Replace	Unhide row/column in selection
Convert excel to pdf	Access password protected worksheet
Delete cells	Protect/Unprotect workbook
Set cell formula	Table related commands
Create workbook	Create worksheet

You can use the **Loop** action to retrieve data from each row in a CSV file. You can also use any of the above action that supports the use of a CSV file within a **Loop** action.

---

**Note:** All the other actions available in the **Excel advanced** package that are not listed in the above table cannot be used with a CSV file.

---

## File package

The **File** package contains actions that enable you to automate various file-related operations such as creating, opening, copying, deleting, and renaming a file.

Use the actions available in the **File** package either individually to perform an action one time or in a **Loop** action to perform that action for each file available in a folder.

### Actions in the File package

---

**Note:** You can use the **Zip** action available in the **Folder** package to compress a file. See [Using the Zip action](#).

---

The **File** package includes the following actions:

Action	Description
Assign	Assigns a file from the Control Room, Desktop, or an existing File variable to a user-defined File variable.
Copy	See <a href="#">Using Copy action for file</a> .
Create	<p>Creates a new file.</p> <ul style="list-style-type: none"> <li>In the <b>File</b> field, specify the name including the location to store the file.</li> <li>In the <b>Overwrite an existing file</b> option, select an existing file with the same name to overwrite it. If existing files are not overwritten, the Control Room appends the name of the new file with a numeric value.</li> </ul>

Action	Description
Create shortcut	<p>Creates a shortcut to the specific file at the user-specified file path. The shortcut is dependent on the source file. If you make changes to the source file, they will also apply to the shortcut.</p> <ul style="list-style-type: none"> <li>In the <b>Source folder</b> field, specify the name and location.</li> <li>In the <b>Destination folder</b> field, specify the name and location.</li> </ul>
Delete	See <a href="#">Using Delete action for file.</a>
Download CR file	<p>Downloads a file from the Control Room to a specified location on the device.</p> <hr/> <p><b>Note:</b> You cannot use this action to download a bot or a file from the My Scripts folder.</p> <hr/> <ul style="list-style-type: none"> <li>In the <b>Select a Control Room file</b> field, specify the file to download.</li> <li>In the <b>Save CR file to location</b> field, specify the path where you want to save the file. You can insert a variable that holds the entire file path, or part of the file path.</li> </ul> <p>For example, C:\user\My Docs\test.csv or C:\user\My Docs\ \$fileName\$</p> <hr/> <p><b>Note:</b> If the folder structure does not already exist, the bot creates the folders as needed.</p> <hr/> <ul style="list-style-type: none"> <li>Select True or False, or insert a Boolean variable to specify whether to overwrite the existing file.</li> </ul>
Get name	Retrieves the file name from the Control Room, desktop, or an existing file variable and stores the file name in a selected output string variable.
Get path	<p>Retrieves the file path from the Control Room, desktop, or an existing file variable and stores the file path in a selected output string variable.</p> <hr/> <p><b>Note:</b> When you select the option Control Room to retrieve the file path, the bot displays the local file path of the downloaded Control Room file.</p> <hr/>
Open	Opens an existing file. In the <b>File</b> field, specify the name including the location to store the file.
Print	See <a href="#">Using Print action for file.</a>
Print multiple files	See <a href="#">Using Print multiple files action .</a>
Rename	See <a href="#">Using Rename action for file.</a>

### Related reference

#### [If package](#)

Use the actions in the **If** package to control the sequence of execution based on one or more conditions of a task.

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

### [Variables overview](#)

Automation 360 offers a variety of variables, each designed to hold specific types of data and is intended for specific use. Use the topics below to learn more about each variable and how to use them.

## Using Copy action for file

Use the **Copy** action to copy an existing file. This action enables you to copy a file based on its size and the date it was created or modified.

To copy an existing file, follow these steps:

1. In the **Actions** palette, double-click or drag the **Copy** action from the **File** package.
2. From the **Source file** field select one of the following options:
  - **Specific:** Specify the name and location of the file.
  - For **Regex:** Specify the source folder path.

You can use a regular expression (regex) in your source file or folder path to support a pattern-based search. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value.

For example, if want to copy, delete, rename or print multiple files from your source folder using pattern based search, use regular expressions either as a **String** and enter the value as `My_` for all file name starting with `My_` or as a **Pattern** such as `[a-z]{3}(.txt|xlsx)` to retrieve files that matches this pattern.

3. In the **Destination file/folder** field, specify the name of the file and location.
4. Select the **Overwrite existing files** check box to overwrite an existing file with the same name at the specified location.

If this option is not selected, the system appends the name of the copied file with a numeric value. For example, if you have copied a file named `June_Quarter_report.pdf` and a file with the same name exists in the location where you want to save the copied file, the system saves the copied file as `June_Quarter_report_(1).pdf`. The numeric value is incremented each time you copy a file with the same name when the overwrite check box is not selected.

5. Select the **Size** check box to copy a file based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Copies a file only if the file size is more than the size you have specified.
    - **Atmost:** Copies a file only if the file size is less than the size you have specified.
    - **Exact:** Copies a file only if the file size is the same as the size you have specified.
  - b) Specify a value in the **Size** field.

6. Select the **Date** check box to copy a file based on the date it was created or modified.
  - a) Select any of the following options from the list:
    - **Created:** Enables you to copy a file based on the date it was created.
    - **Modified:** Enables you to copy a file based on the date it was modified.
  - b) Select the **Is within last** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified within the number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the file if it was created or modified in the last 7 days.
  - c) Select the **Is between** option to specify a period.  
This option enables you to specify a **Start date** and an **End date** for the period. For example, if you specify 01/01/19 as the start date and 01/31/19 as the end date of the period, the system performs the operation on the file if it was created or modified between this period.
 

---

**Note:** The **Start date** and **End date** are included in the period.

---
  - d) Select the **Is before** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified on or before the date you have specified.
7. Click **Save**.

## Using Delete action for file

Use the **Delete** action to delete a file. This action enables you to delete a file based on its size and the date it was created or modified.

Follow these steps to delete a file:

1. In the **Actions** palette, double-click or drag the **Delete** action from the **File** package.
2. From the **Source file** field select one of the following options:
  - **Specific:** Specify the name and location of the file.
  - For **Regex:** Specify the source folder path.  
You can use a regular expression (regex) in your source file or folder path to support a pattern-based search. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value.  
For example, if want to copy, delete, rename or print multiple files from your source folder using pattern based search, use regular expressions either as a **String** and enter the value as My\_ for all file name starting with My\_ or as a **Pattern** such as [a-z]{3}(.txt|xlsx) to retrieve files that matches this pattern.
3. Select the **Size** check box to delete a file based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Deletes a file only if the file size is more than the size you have specified.
    - **Atmost:** Deletes a file only if the file size is less than the size you have specified.
    - **Exact:** Deletes a file only if the file size is the same as the size you have specified.
  - b) Specify a value in the **Size** field.
4. Select the **Date** check box to delete a file based on the date it was created or modified.
  - a) Select any of the following options from the list:

- **Created:** Enables you to delete a file based on the date it was created.
  - **Modified:** Enables you to delete a file based on the date it was modified.
- b) Select the **Is within last** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified within the number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the file if it was created or modified in the last 7 days.
- c) Select the **Is between** option to specify a period.  
This option enables you to specify a **Start date** and an **End date** for the period. For example, if you specify 01/01/19 as the start date and 01/31/19 as the end date of the period, the system performs the operation on the file if it was created or modified between this period.
- 
- Note:** The **Start date** and **End date** are included in the period.
- 
- d) Select the **Is before** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified on or before the date you have specified.

## 5. Click **Save**.

## Using Rename action for file

Use the **Rename** action to rename a file. This action enables you to rename a file based on its size and the date it was created or modified.

To rename a file, follow these steps:

1. In the **Actions** palette, double-click or drag the **Rename** action from the **File** package.
2. From the **Source file** field select one of the following options:
  - **Specific:** Specify the name and location of the file.
  - For **Regex:** Specify the source folder path.

You can use a regular expression (regex) in your source file or folder path to support a pattern-based search. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value.

For example, if want to copy, delete, rename or print multiple files from your source folder using pattern based search, use regular expressions either as a **String** and enter the value as `My_` for all file name starting with `My_` or as a **Pattern** such as `[a-z]{3}(.txt|xlsx)` to retrieve files that matches this pattern.

3. In the **New file name** field, specify a new name for the file.
4. Select the **Size** check box to rename a file based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Renames a file only if the file size is more than the size you have specified.
    - **Atmost:** Renames a file only if the file size is less than the size you have specified.
    - **Exact:** Renames a file only if the file size is the same as the size you have specified.
  - b) Specify a value in the **Size** field.
5. Select the **Date** check box to rename a file based on the date it was created or modified.
  - a) Select any of the following options from the list:
    - **Created:** Enables you to rename a file based on the date it was created.

- **Modified:** Enables you to rename a file based on the date it was modified.
- b) Select the **Is within last** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified within the number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the file if it was created or modified in the last 7 days.
  - c) Select the **Is between** option to specify a period.  
This option enables you to specify a **Start date** and an **End date** for the period. For example, if you specify 01/01/19 as the start date and 01/31/19 as the end date of the period, the system performs the operation on the file if it was created or modified between this period.

---

**Note:** The **Start date** and **End date** are included in the period.

---

- d) Select the **Is before** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified on or before the date you have specified.

## 6. Click **Save**.

### Using Print action for file

Use the **Print** action to print a file. This action enables you to print a file based on its size and the date it was created or modified.

Follow these steps to print a file:

1. In the **Actions** palette, double-click or drag the **Print** action from the **File** package.
2. In the **File** field, specify the name and location of the file.
3. Select the **Size** check box to print a file based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Prints a file only if the file size is more than the size you have specified.
    - **Atmost:** Prints a file only if the file size is less than the size you have specified.
    - **Exact:** Prints a file only if the file size is the same as the size you have specified.
  - b) Specify a value in the **Size** field.
4. Select the **Date** check box to print a file based on the date it was created or modified.
  - a) Select any of the following options from the list:
    - **Created:** Enables you to print a file based on the date it was created.
    - **Modified:** Enables you to print a file based on the date it was modified.
  - b) Select the **Is within last** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified within the number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the file if it was created or modified in the last 7 days.
  - c) Select the **Is between** option to specify a period.  
This option enables you to specify a **Start date** and an **End date** for the period. For example, if you specify 01/01/19 as the start date and 01/31/19 as the end date of the period, the system performs the operation on the file if it was created or modified between this period.

---

**Note:** The **Start date** and **End date** are included in the period.

---

- d) Select the **Is before** option and specify a value in the field.  
This option enables you to perform the operation on the file if it was created or modified on or before the date you have specified.

5. Click **Save**.

## Using Print multiple files action

Use **Print multiple files** to print multiple files based on the size and the date they were created or modified.

Follow these steps to print multiple files:

1. In the **Actions** palette, double-click or drag the **Print multiple files** action from the **File** package.
2. In the **Folder** field, specify the name and location of the folder.
3. From the **File type** field, select **String** to specify the file type of your files or **Regex**  
Use the regular expression in your source file or folder path to support pattern based search. Select the regular expression (Regex) either as a **String** or **Pattern** for each regex condition and input the regex value.

For example, you can use regular expressions either as a **String** and enter the value as `M_Y_` for all file name starting with `M_Y_` or as a **Pattern** such as `[a-z]{3}(.txt|xlsx)` to retrieve files that matches this pattern.

4. Select the **Include subfolders** check box to include all the subfolders in your selected folder.
5. Select the **Size** check box to print multiple files based on their size.
  - a) Select any of the following options from the list:
    - **Atleast:** Prints multiple files only if the file size is more than the size you have specified.
    - **Atmost:** Prints multiple files only if the file size is less than the size you have specified.
    - **Exact:** Prints multiple files only if the file size is the same as the size you have specified.
  - b) Specify a value in the **Size** field.
6. Select the **Date** check box to print multiple files based on the date they were created or modified.
  - a) Select any of the following options from the list:
    - **Created:** Enables you to print multiple files based on the date they were created.
    - **Modified:** Enables you to print multiple files based on the date they were modified.
  - b) Select the **Is within last** option and specify a value in the field.  
This option enables you to perform the operation on the files if they were created or modified within the number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the files if they were created or modified in the last 7 days.
  - c) Select the **Is between** option to specify a period.  
This option enables you to specify a **Start date** and an **End date** for the period. For example, if you specify 01/01/19 as the start date and 01/31/19 as the end date of the period, the system performs the operation on the files if they were created or modified between this period.  

---

**Note:** The **Start date** and **End date** are included in the period.

---
  - d) Select the **Is before** option and specify a value in the field.  
This option enables you to perform the operation on the files if they were created or modified on or before the date you have specified.

## 7. Click **Save**.

### Folder package

The **Folder** package contains actions that enable you to automate folder-related operations.

### Actions in the Folder package

The **Folder** package includes the following actions:

Action	Description
Copy	See <a href="#">Using Copy action</a> .
Create	<p>Creates a new folder.</p> <ul style="list-style-type: none"> <li>In the <b>Folder</b> field, specify the name and location.</li> </ul> <hr/> <p><b>Note:</b> Folder names cannot include system actions or device references such as AUX, CON, LPT, NUL, and PRN.</p> <hr/> <ul style="list-style-type: none"> <li>Select the <b>Overwrite an existing folder</b> check box to overwrite an existing folder.</li> </ul> <hr/> <p><b>Note:</b> If this option is not selected, the system appends the name of the new folder with a numeric value.</p> <hr/>
Create shortcut	<p>Creates a shortcut to the specific folder at the user-specified file path. The shortcut is dependent on the source folder. If you make changes to the source folder, they will also apply to the shortcut.</p> <ul style="list-style-type: none"> <li>In the <b>Source folder</b> field, specify the name and location.</li> <li>In the <b>Destination folder</b> field, specify the name and location.</li> </ul>
Delete	See <a href="#">Using Delete action</a> .
Open	<p>Opens a folder at a specific location.</p> <p>In the <b>Folder</b> field, specify the name and location.</p>
Rename	See <a href="#">Using Rename action</a> .
Unzip	See <a href="#">Using Unzip action</a> .
Zip	See <a href="#">Using the Zip action</a> .

### Using Copy action

Use the **Copy** action to copy an existing folder.

- In the **Actions** palette, double-click or drag the **Copy** action from the **Folder** package.
- In the **Source folder** field, specify the name and location.
- In the **Destination folder** field, specify the folder name and location to save the copied folder.
- Select the **Overwrite existing files/folders** check box to overwrite existing folders with the same name.

---

**Note:** If this option is not selected, the system appends a numeric value at the end of the file name. For example, if you save the `June_Quarter_report` file in a location that has a file with the same name, the system saves the file as `June_Quarter_report_(1).pdf`. The numeric value is incremented each time you save the file as long as the option is selected.

---

5. Select the **Size** check box to copy a folder based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Copies a folder only if the folder size is more than the size you have specified.
    - **Atmost:** Copies a folder only if the folder size is less than the size you have specified.
    - **Exact:** Copies a folder only if the folder size is the same as the size you have specified.
  - b) In the **Size** field, specify the folder size.
  
6. Select the **Date** check box to copy a folder based on the date.
  - a) Select any of the following options from the list:
    - **Created:** Enables you to copy a folder based on the date it was created.
    - **Modified:** Enables you to copy a folder based on the date it was modified.
  - b) In the **Is within last**, specify the value.  
 This option enables you to perform the operation on the folder if it was created or modified within the last number of days you have specified. For example, if you specify `7` in the field, the system performs the operation on the folder if it was created or modified in the last 7 days.
  - c) In the **Is between**, specify the period.  
 This option enables you to specify a **Start date** and an **End date** of the period. For example, if you specify `01/01/19` and `01/31/19` as the start date and end date of the period, the system performs the operation on the folder if it was created or modified between this period.

---

**Note:** The **Start date** and **End date** are included in the period.

---

  - d) In the **Is before**, specify the value.  
 This option enables you to perform the operation on the folder if it was created or modified on or before the date you have specified.
  
7. Click **Save**.

## Using Delete action

Use the **Delete** action to delete a folder.

1. In the **Actions** palette, double-click or drag the **Delete** action from the **Folder** package.
2. In the **Folder** field, specify the name and location.
3. Select the **Size** check box to delete a folder based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Deletes a folder only if the folder size is more than the size you have specified.
    - **Atmost:** Deletes a folder only if the folder size is less than the size you have specified.
    - **Exact:** Deletes a folder only if the folder size is the same as the size you have specified.
  - b) In the **Size** field, specify the folder size.
4. Select the **Date** check box to delete a folder based on the date it was created or modified.

- a) Select any of the following options from the list:
- **Created:** Enables you to delete a folder based on the date it was created.
  - **Modified:** Enables you to delete a folder based on the date it was modified.
- b) In the **Is within last**, specify the value.  
This option enables you to perform the operation on the folder if it was created or modified within the last number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the folder if it was created or modified in the last 7 days.
- c) In the **Is between**, specify the period.  
This option enables you to specify a **Start date** and an **End date** of the period. For example, if you specify 01/01/19 and 01/31/19 as the start date and end date of the period, the system performs the operation on the folder if it was created or modified between this period.
- 
- Note:** The **Start date** and **End date** are included in the period.
- 
- d) In the **Is before**, specify the value.  
This option enables you to perform the operation on the folder if it was created or modified on or before the date you have specified.

5. Click **Save**.

## Using Rename action

Use the **Rename** action to rename a folder.

1. In the **Actions** palette, double-click or drag the **Rename** action from the **Folder** package.
2. In the **Folder** field, specify the name and location.
3. In the **New folder name** field, specify a new name.
4. Select the **Size** check box to rename a folder based on its size.
  - a) Select any of the following options from the list:
    - **Atleast:** Renames a folder only if the folder size is more than the size you have specified.
    - **Atmost:** Renames a folder only if the folder size is less than the size you have specified.
    - **Exact:** Renames a folder only if the folder size is the same as the size you have specified.
  - b) In the **Size** field, specify the folder size.

5. Select the **Date** check box to rename a folder based on the date it was created or modified.
  - a) Select any of the following options from the list:
    - **Created:** Enables you to rename a folder based on the date it was created.
    - **Modified:** Enables you to rename a folder based on the date it was modified.
  - b) In the **Is within last**, specify the value.  
This option enables you to perform the operation on the folder if it was created or modified within the last number of days you have specified. For example, if you specify 7 in the field, the system performs the operation on the folder if it was created or modified in the last 7 days.
  - c) In the **Is between**, specify the period.  
This option enables you to specify a **Start date** and an **End date** of the period. For example, if you specify 01/01/19 and 01/31/19 as the start date and end date of the period, the system performs the operation on the folder if it was created or modified between this period.  

---

**Note:** The **Start date** and **End date** are included in the period.

---
  - d) In the **Is before**, specify the value.  
This option enables you to perform the operation on the folder if it was created or modified on or before the date you have specified.
6. Click **Save**.

## Using Unzip action

Use the **Unzip** action to extract compressed files and folders from a zip file to a specific location.

1. In the **Actions** palette, double-click or drag the **Unzip** action from the **Folder** package.
2. In the **Zip file name with full path** field, specify the name and location.
3. In the **Extract to path** field, specify the location.
4. Select the **Replace existing file** check box to overwrite the file.
5. Optional: In the **Password to access zip file** field, select either **Credential** to specify a stored password, or select **String** to enter a password manually.
6. Click **Save**.

## Using the Zip action

Use the **Zip** action to compress files and folders into a zip file.

1. In the **Actions** palette, double-click or drag the **Zip** action from the **Folder** package.
2. In the **Specify file(s)/folder(s) to compress** field, specify the location.
3. In the **Specify file type(s) to compress** field, select one of the following options:
  - **String:** Specify the file extension.  
For example, you can specify .txt and .png to compress only text files and PNG images. The system compresses the entire folder if you do not specify any file type. You can also specify the name of a file to compress a specific file.
  - **Regex:** Select the regular expression (regex) either as a **String** or **Pattern** for each regular expression condition and enter the value.

For example, you can use regular expressions either as a **String** and enter the value as `M_y_` for all file name starting with `M_y_` or as a **Pattern** such as `[a-z]{3}(.txt|xlsx)` to retrieve files that matches this pattern.

4. In the **Specify destination filename and location** field, specify the zip file name and location.
5. Select the **Update only if newer** check box to compress the files only if one or more files were updated after the last compression.  
This option is useful when you are repeatedly compressing the same set of files and storing the output zip file with the same name at the same location. For example, you compress five PDF files from the `Reports` folder on a monthly basis and save the output zip file with the `Monthly Report` name in the `D:` drive. When this option is selected, the system compresses the files only if one or more PDF files are updated after the last compression.
6. Select the **Delete original files** check box if you want to delete the original files after they are included in the zip file.
7. In the **Compression** list, select between **Normal**, **Fast**, and **Superfast** to specify the speed for compression.
8. Optional: In the **Password protection** field, select **Credential** to specify a stored password or select **String** to enter a password manually.
9. Click **Save**.

## FTP / SFTP package

Use the FTP / SFTP package to automate FTP / SFTP operations.

An FTP/SFTP server hosts the files to share. The client accesses, downloads, or uploads files to the server. The transfer of data between the client and server is done using a TCP/IP network, which is the standard protocol of communication over the internet.

- The following are some forms of authentication for an FTP server:
  - User credentials: Requires an FTP username and password.
  - Anonymous: This form of authentication is enabled on sites where files are available for public access and the users need not identify themselves to the server.
  - Key-based: SFTP authentication is usually done with a private and public key. The key pair is automatically generated by the computer. The private key is kept with the SFTP client and the corresponding public key with the SFTP server. When establishing a connection, the client shares the private key to be matched with the corresponding public key on the server.
- FTP can run in active or passive transfer mode.
  - In the active mode, the client informs the server about the port used for listening and starts listening for incoming data connections from the server.
  - In the passive mode, the client receives a server IP address and server port number from the server. The client opens a data connection to the server IP address and server port number that are received. Most organizations prefer the passive mode because it involves less or no alterations to the firewall settings.
- FTP supports binary and ASCII file transfer types:
  - Use the binary option when transferring executable files.
  - Use the ASCII option when transferring text files.

## Before you start

Perform the following actions within the FTP / SFTP package.

1. Establish a connection with the FTP/SFTP server using the **Connect** action. When establishing a connection, associate the FTP/SFTP server details with a session name. Use the same session name for all corresponding actions.
2. Use the FTP/SFTP actions to automate a task. The actions enable you to perform following tasks:
  - Upload, download, delete, or rename files.
  - Upload, download, create, or delete folders.
  - Navigate to the parent folder or a specific folder.
3. After you have automated the tasks related to FTP / SFTP, terminate the connection to the server using the **Disconnect** action.

---

**Note:** SFTP with SSH1 protocol is no longer supported by SFTP.

---

## Actions in the FTP / SFTP package

The FTP / SFTP package includes the following actions:

Action	Description
Change folder	<p>Navigates to either the parent folder or another specific folder on an FTP/SFTP server.</p> <ul style="list-style-type: none"> <li>• Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>• Select either <b>Go to parent folder</b> or <b>Specific folder</b> in <b>Navigate to</b> options.</li> </ul> <p>If the <b>Specific folder</b> option is selected, enter the complete folder path.</p>
Connect	See <a href="#">Using Connect action for FTP/SFTP</a> .
Create folder	<p>Creates a folder in an existing folder on the FTP/SFTP server.</p> <ul style="list-style-type: none"> <li>• Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>• Specify the folder name in the <b>Remote folder</b> field with the path to create a folder on the FTP server.</li> </ul> <hr/> <p><b>Note:</b> The system encounters an error if a folder with the same name exists in the parent folder.</p> <hr/>

Action	Description
Delete files	<p>Deletes files from an FTP/SFTP folder.</p> <ul style="list-style-type: none"> <li>Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>Specify file names in the <b>Remote files</b> field along with the complete path, separated by a semicolon.</li> </ul>
Delete folder	<p>Deletes a folder (including all the subfolders and files within it) from an FTP/SFTP server.</p> <ul style="list-style-type: none"> <li>Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>Specify the folder name in the <b>Remote folder</b> field.</li> </ul>
Disconnect	<p>Terminates the connection to the FTP/SFTP server.</p> <p>Enter the session name – Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p>
Get files	<p>Downloads files from a remote FTP/SFTP folder to a specific folder on the client machine.</p> <ul style="list-style-type: none"> <li>Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>Select files on the remote FTP server that you want to download on the local system.</li> <li>In the <b>Local folder</b> field, enter the name of the folder where you want to download files from the FTP/SFTP server.</li> <li>Select the <b>Transfer Type</b> as <b>Binary</b> or <b>ASCII</b>.</li> <li>You can also specify folders based on the date they are created or modified.</li> </ul>
Get folders	<p>Downloads a folder from an FTP/SFTP server to a client machine.</p> <ul style="list-style-type: none"> <li>Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>Select folders on the remote FTP server that you want to download on the local system.</li> </ul> <p>Specify filters using wildcard characters to download only specific types of files.</p> <ul style="list-style-type: none"> <li>In the <b>Local folder</b> field, enter the name of the folder where you want to download files from the FTP/SFTP server.</li> <li>You can also specify folders based on the date they are created or modified.</li> </ul>

Action	Description
Put files	<p>Uploads one or more files from the client machine to the FTP/SFTP server.</p> <ul style="list-style-type: none"> <li>• Enter the session name. Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</li> <li>• Enter all the file names along with their location, separated by a semicolon.</li> <li>• Select the <b>Transfer type</b> to be either <b>Binary</b> or <b>ASCII</b></li> </ul>
Put folders	<p>Uploads a folder from the client machine to the FTP/SFTP server.</p> <ul style="list-style-type: none"> <li>• Enter the session name. Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</li> <li>• Enter the folder name in the <b>Local folder</b> field which you want to upload on FTP/SFTP server.</li> <li>• Specify filters using wild card characters to restrict uploads to specific types of files.</li> </ul>
Rename files	<p>Renames files in an FTP/SFTP folder.</p> <ul style="list-style-type: none"> <li>• Enter the session name.</li> </ul> <p>Use the same session name that you have provided when establishing a connection with the FTP/SFTP server using the <b>Connect</b> action.</p> <ul style="list-style-type: none"> <li>• In the <b>Remote file</b> field, enter the name of the file that you want to rename.</li> <li>• Enter the new name in the <b>New remote file</b> field.</li> </ul>

## Using Connect action for FTP/SFTP

Use the **Connect** action to establish a connection with the FTP/SFTP server that you want to use to automate tasks. This must be the first action you use to automate an FTP/SFTP-related task.

Specify details of the FTP/SFTP server and associate it with a session name. Use the session name provided in this action in the other actions so that you do not have to provide details of the server in those actions.

To establish a connection with an FTP/SFTP server, perform these steps:

1. Double-click or drag the **Connect** action from the **FTP/SFTP** node in the **Actions** palette.
2. Enter a name for the session in the **Session name** field.
3. Enter the FTP/SFTP server name in the **Server name** field.
4. Specify the port number.

## 5. Select one of the following options to specify the server type:

Option	Steps
<b>FTP</b>	<p><b>Authentication type:</b> You can either choose to authenticate the user using <b>User credentials</b> or log in as <b>Anonymous</b>.</p> <p>If you choose <b>User credentials</b>, complete these fields:</p> <p><b>Username:</b> Select <b>Credential</b> for enhanced security or <b>String</b>:</p> <ul style="list-style-type: none"> <li>• <b>Credential:</b> Select the Credential Vault variable to insert the <b>Username</b> and <b>Password</b>.</li> <li>• <b>String:</b> Enter the value directly in the field.</li> </ul> <p><b>Transfer Mode:</b> Select the transfer mode to be <b>Active</b> or <b>Passive</b>.</p> <p><b>Transfer type:</b> Select the type to be either <b>Binary</b> or <b>ASCII</b> for transferring files between the server and client.</p> <p><b>Optional:</b> Enter the default directory path on the FTP server.</p>
<b>FTP Secure</b>	<p><b>Authentication type:</b> You can either choose to authenticate the user using <b>User credentials</b> or log in as <b>Anonymous</b>. If you choose <b>User credentials</b>, complete these fields:</p> <p><b>Username:</b> Select <b>Credential</b> for enhanced security or <b>String</b>:</p> <ul style="list-style-type: none"> <li>• <b>Credential:</b> Select the Credential Vault variable to insert the <b>Username</b> and <b>Password</b>.</li> <li>• <b>String:</b> Enter the value directly in the field.</li> </ul>
<b>SSH FTP</b>	<p>Select the <b>Private Key File</b> from <b>Control Room file</b>, <b>Desktop file</b>, or <b>Variable</b>.</p> <hr/> <p><b>Note:</b> Ensure that the SFTP server has a corresponding public key file.</p> <hr/> <p>You can either choose to authenticate the user using <b>User credentials</b> or log in as <b>Anonymous</b>. If you choose <b>User credentials</b>, complete these fields:</p> <ul style="list-style-type: none"> <li>• <b>With username:</b> To enter the <b>Username</b>, select <b>Credential</b> or <b>String</b> option. <ul style="list-style-type: none"> <li><b>Credential:</b> Select the Credential Vault variable to insert the <b>Username</b>.</li> <li><b>String:</b> Enter the value directly in the field.</li> </ul> </li> <li>• <b>With username-password:</b> To enter the <b>Username</b> and <b>Password</b>, select either the <b>Credential</b> or <b>String</b> option.</li> </ul> <p>If you choose to authenticate using the user credentials, insert a Credential Vault variable for enhanced security or enter the value directly in the string field.</p>

6. Select **Reconnect if connection fails** if you want to automatically reconnect:

---

**Note:** If the connection fails due to incorrect credentials, the action will not attempt to reconnect.

---

- a) Specify the number of attempts in the **Attempts** field.
- b) Select the time lapse in the **Time between attempts** field.

7. Click **Save**.

## Fuzzy match package

Use the **Fuzzy match** action to compare the values of two strings or files for similarity. This action returns a decimal value; the closer the value to 1.0, the greater the similarity between the two strings.

Use this action to automate the process of evaluating strings of data for similarity. For example, you have an automation sequence in which a bot extracts data from invoices, searches a database for the company record, and updates the record with data from the invoice. Use the **Fuzzy match** action to handle two possible scenarios:

- A mistake occurs at the extraction step where a letter is incorrectly extracted. Instead of Apple, the bot extracts App1e, with a numerical one instead of the letter l.
- There is a small variation between the company name on the invoice and in the database. The invoice contains the company name Apple Inc, but the database has a record for the company name Apple.

## Google Calendar package

The **Google Calendar** package contains actions that enable you to automate creating and deleting events.

### Before you start

Use the actions in the Google Calendar package in the following order:

1. Use the **Connect** to establish a connection to the Google server.

See [Using the Connect action for Google packages](#).

2. Use a combination of available in this to automate tasks.

---

**Note:** To use from other Google establish a connection using the **Connect** from that .

---

3. Use the **Disconnect** to terminate the connection.

### Actions in the **Google Calendar** package

The **Google Calendar** package includes the following actions:

Action	Description
Create event	See <a href="#">Using the Create new calendar event action</a> .

Action	Description
Delete event	<p>Removes the event from the calendar.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the <b>Event Id</b>. This is the string in the URL that appears after <code>/eventedit/</code> when you open an event for editing.</li> <li>• <b>Optional:</b> Assign the event to a String variable.</li> </ul>

## Using the Create new calendar event action

Use the **Create new calendar event** action to specify event attendees, duration, location, recurrence, and title. During run time, this action triggers an email notification to meeting attendees.

To create a new calendar event, do the following:

1. Enter the session name you used to connect to the G-Suite server in the **Connect** action.  
See [Using the Connect action for Google packages](#).
2. Enter the event title.
3. Optional: Enter the location.
4. Optional: Enter the attendees' email addresses, separated with commas.
5. Enter the start date.  
Use the format yyyy-MM-dd.
6. Enter the end date.  
Use the format yyyy-MM-dd.
7. Select the **All Day** or **Specify Time** option from the **Event Time** option.
  - If you select the **All Day** option, you do not need to provide any additional details.
  - If you select the **Specify Time** option, complete the following fields:
    - Specify the **Start Time** using the HH:mm:ss format.
    - Specify the **End Time** using the HH:mm:ss format.
8. Select the **Use System Timezone** or **Specify Timezone** option from the **Timezone** option.
  - If you select the **Use System Timezone** option, you do not need to provide any additional details.
  - If you select the **Specify Timezone** option, complete the following fields:
    - Specify the **Start Timezone**.
    - Specify the **End Timezone**.
9. Optional: Mark the **Recurring** option to make this event repeat.
10. Select a Visibility option from the drop-down list.  
Select from **Default**, **Public**, or **Private**.
11. Optional: Enter an event description.
12. Optional: Select a string variable from the drop-down list to store the id of the created event.
13. Click **Save**.

## Using the Connect action for Google packages

Use the **Connect** action to establish a connection with the Google server in order to use other actions from that same package to automate tasks. All of the fields in this action accept a credential from the Credential Vault, variable, or a user-input value.

Configure the OAuth settings in the Google Cloud Platform and retrieve the credentials necessary to connect Automation Anywhere Enterprise with your Google G Suite applications.

1. If you have not already done so, *create a project*.
2. *Enable the APIs* for the Google G Suite applications you want to automate, such as the Google Drive API, Google Calendar API, and Google Sheets API.
3. Do the steps in *Setting up OAuth 2.0* to generate the Client ID and Secret.

---

### Note:

- Select the **Web application** option.
  - Add this authorized redirect URI: `http://localhost:8888/Callback`
- 
4. Do these steps to set up *user consent* for the username that you will use to connect to Automation Anywhere Enterprise.
    1. In the **Actions** palette, double-click or drag the **Connect** action from the package you want to use.
    2. In the **Username** field, select the credential or credential variable that contains your Google username. To enter a value, click **Insecure string**.
    3. If you are configuring the **Connect** action for the Google Calendar or Google Sheets package, enter a session name.
    4. In the **Client Id** field, select the credential or credential variable that contains the client ID. To enter a value, click **Insecure string**.
    5. In the **Redirect URI** field, enter `http://localhost:8888/Callback`.
    6. In the **Client secret** field, select the credential or credential variable that contains the access token. To enter a value, click **Insecure string**.
    7. Click **Save**.

The first time the bot runs, the Google login window will appear. You must select the Google account and approve the requested access permissions.

Use other the actions from the same Google package to automate tasks. To use actions from another Google packages, establish a connection using the **Connect** action from that package.

### Related reference

[Google Calendar package](#)

The **Google Calendar** package contains actions that enable you to automate creating and deleting events.

[Google Drive package](#)

The **Google Drive** package contains actions that enable you to automate tasks related to files and folders.

[Google Sheets package](#)

The **Google Sheets** package contains actions that enable you to automate tasks involving cells, columns, rows, and sheets.

## Google Drive package

The **Google Drive** package contains actions that enable you to automate tasks related to files and folders.

### Before you start

Use the actions in the Google Drive package in the following order:

1. Use the **Connect** to establish a connection to the Google server.

See [Using the Connect action for Google packages](#).

2. Use a combination of available in this to automate tasks.

---

**Note:** To use from other Google establish a connection using the **Connect** from that .

---

3. Use the **Disconnect** to terminate the connection.

### Actions in the **Google Drive** package

The **Google Drive** package includes the following actions:

Action	Description
Check permissions	<p>Checks for a file or folder permissions and returns <code>read</code>, <code>write</code>, or <code>delete</code> to a list variable.</p> <ul style="list-style-type: none"> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to check permissions for a file or folder and enter the file/folder name and path.</li> <li>• Select which permissions to check for: <b>Read</b>, <b>Write</b>, or <b>Delete</b>.</li> <li>• Select or create a list variable to hold the permissions.</li> </ul>

Action	Description
Copy file	<p>Copies a file from one folder to another in the Google Drive</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the source file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select whether to identify the destination folder by directory path and name, or by ID.</li> <li>• <b>Optional:</b> Mark the <b>Rename file</b> option and enter the new file name.</li> </ul>
Copy folder	<p>Copies a folder from one location to another.</p> <ul style="list-style-type: none"> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the source file by folder path and name, or by ID. If this is a shared folder, you must use the <b>Folder ID</b> option.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select whether to identify the destination folder by directory path and name, or by ID.</li> </ul>

Action	Description
Create file permission	<p>Creates a new permission for a file.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12d1AwvrEA4JeLysfFky9</code>, the ID is <code>12d1AwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select a role. For more information, see <a href="#">Google Drive Roles</a>.</li> <li>• Select the grantee type. Choose from: <ul style="list-style-type: none"> <li>• User</li> <li>• Group</li> <li>• Domain</li> <li>• Anyone</li> </ul> </li> <li>• If you select User or Group, enter the email address. If you select domain, enter the domain.</li> <li>• <b>Optional:</b> Select or create a variable to hold the permission ID.</li> </ul>
Create folder	<p>Creates a folder.</p> <ul style="list-style-type: none"> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Enter the parent folder where to create the folder. To create the folder in the root folder enter <code>root</code>.</li> <li>• Enter the folder name.</li> <li>• <b>Optional:</b> Select or create a string variable to hold the ID of the new folder.</li> </ul>
Delete file	<p>Deletes a file on your Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12d1AwvrEA4JeLysfFky9</code>, the ID is <code>12d1AwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> Select or create a boolean variable to hold the file delete status.</li> </ul>

Action	Description
Delete file permission	<p>Deletes a file permission for a file.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• In the <b>Permission id</b> field, enter the permission ID.</li> <li>• <b>Optional:</b> Select or create a variable to hold the permission ID.</li> </ul>
Delete folder	<p>Deletes a folder from the Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the folder by path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://drive.google.com/drive/folders/0B0MqCb--3Y8QQz1JcVRJb3UxcTg</code>, the ID is <code>0B0MqCb--3Y8QQz1JcVRJb3UxcTg</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> Select or create a boolean variable to hold the folder delete status.</li> </ul>

Action	Description
Download file	<p>Downloads a file from your Google Drive to a specific location on your desktop.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Specify the download file path. For example, <code>C:/Users/Downloads/</code>.</li> <li>• <b>Optional:</b> Mark the <b>Overwrite existing file</b> option to overwrite the file of the same name.</li> <li>• <b>Optional:</b> Mark the <b>Rename file</b> option to enter a new name for the downloaded file.</li> <li>• <b>Optional:</b> Select or create a variable to hold the ID of the downloaded file.</li> </ul>
Find file/folder	<p>Finds files or folders in a specific directory in your Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to search for files or folders.</li> <li>• Enter the source folder to search in. For example, <code>/Home/Accounts/</code>.</li> <li>• Specify whether to return exact matches or</li> <li>• Enter the file or folder name to search for.</li> <li>• Select or create a variable to hold the list of files or folders.</li> </ul>
Get file information	<p>Gets file information of a file.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select or create a dictionary variable to hold the file information which is stored in two keys: the <code>name</code> key holds the file name and the <code>extension</code> key holds the file extension.</li> </ul>

Action	Description
Get file permission	<p>Retrieves file information for specific file or folder from Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select or create a list variable to hold the file permissions.</li> </ul>
Move file	<p>Moves a file from one folder to another.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select whether to identify the destination folder by directory path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/>

Action	Description
Move folder	<p>Moves a folder from one location to another.</p> <ul style="list-style-type: none"> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the source file by folder path and name, or by ID. If this is a shared folder, you must use the <b>Folder ID</b> option.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Select whether to identify the destination folder by directory path and name, or by ID.</li> </ul>
Open file	<p>Opens a file from the specified directory in Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/>
Open folder	<p>Opens a folder from the specified directory in Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the folder by directory path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/>

Action	Description
Rename file	<p>Renames a file in the Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the new file name.</li> </ul>
Rename folder	<p>Renames a folder in a specific directory in Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Select whether to identify the folder by directory path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the new folder name.</li> </ul>
Upload file	<p>Uploads a file from the desktop to your Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Enter the same username that you provided in the <b>Connect</b> .</li> <li>• Enter the file path and name.</li> <li>• Select whether to identify the folder where to upload the file by directory path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> Mark the <b>Overwrite existing file</b> option to overwrite the file of the same name.</li> <li>• <b>Optional:</b> Select or create a variable to hold the ID of the uploaded file.</li> </ul>

Action	Description
Update file permission	<p>Update the permissions for a file.</p> <ul style="list-style-type: none"> <li>• Enter the same session name that you provided in the <b>OAuth</b> action.</li> <li>• Select whether to identify the file by file path and name, or by ID.</li> </ul> <hr/> <p><b>Note:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• In the <b>Permission id</b> field, enter your user ID.</li> <li>• Select a role. For more information, see <a href="#">Google Drive Roles</a>.</li> <li>• <b>Optional:</b> Select or create a variable to hold the permission ID.</li> </ul>

## Google Sheets package

The **Google Sheets** package contains actions that enable you to automate tasks involving cells, columns, rows, and sheets.

### Before you start

Use the actions in the Google Sheets package in the following order:

1. Use the **Connect** to establish a connection to the Google server.

See [Using the Connect action for Google packages](#).

2. Use a combination of available in this to automate tasks.

---

**Note:** To use from other Google establish a connection using the **Connect** from that .

---

3. Use the **Disconnect** to terminate the connection.

### Actions in the **Google Sheets** package

The actions in the **Google Sheets** package enable you to perform the following operations:

Action	Description
Activate sheet	<p>Activates a specific sheet in the open spreadsheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Specify whether to activate the sheet by index or name.</li> </ul> <hr/> <p><b>Note:</b> The sheet index count begins at 1.</p>
Autofit columns	Resizes the columns that contain data to accommodate the data. Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.
Autofit rows	Resizes the rows that contain data to accommodate the data. Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.
Close	Saves and closes the current spreadsheet. Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.
Create sheet	<p>Creates a new sheet in the open workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Specify whether to create the sheet by index or name.</li> </ul> <hr/> <p><b>Note:</b> The sheet index count begins at 1.</p>
Create workbook	<p>Creates a new workbook in your Google Drive.</p> <ul style="list-style-type: none"> <li>• Enter the username you used in the <b>Connect</b> action.</li> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Enter the workbook name with one of the following file extensions: .xlsx, .xls, or .xlsm</li> <li>• Enter the file path for the new workbook or select a file variable.</li> </ul>

Action	Description
Delete cell	<p>Deletes cells within a worksheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select either the <b>Active cell</b> or <b>Specific cell</b> option. If you have selected the <b>Specific cell</b>, enter the cell address.</li> <li>• Select from the following delete options: <ul style="list-style-type: none"> <li>• Shift cells left</li> <li>• Shift cells up</li> <li>• Entire row</li> <li>• Entire column</li> </ul> </li> </ul>
Delete range	<p>Delete a range of cells.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Enter the range address. For example A1 : B4.</li> <li>• Select the direction in which to shift the remaining active cells: <b>Up</b> or <b>Left</b>.</li> </ul>
Delete row/column	<p>Deletes a row or column in a worksheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select whether to perform a row or column operation.</li> <li>• Specify whether to delete the sheet by index or name.</li> <li>• Specify whether to delete by index, active cell, or range. <ul style="list-style-type: none"> <li>• If you select index, enter the row/column index</li> </ul> <hr/> <p><b>Note:</b> The index count begins at 1.</p> <ul style="list-style-type: none"> <li>• If you select range, specify the range of the rows/columns to delete. For example 1 : 10 to delete the first ten rows.</li> </ul> </li> </ul>
Delete sheet	<p>Deletes a sheet from the workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Specify whether to delete the sheet by index or name.</li> </ul>

Action	Description
Find cells which contains search key	See <a href="#">Using the Find action</a>
Get multiple cells	<p>Retrieves the values from the cells in a Google sheet and stores them in a table variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select the <b>Multiple cells</b> option to retrieve values from a range of cells, or select <b>All cells</b> to retrieve values from all the cells.</li> <li>• Select or create a table variable to hold the output.</li> </ul>
Get single cell	<p>Retrieves the value from the specific cell in a Google sheet and stores it in a string variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select either the <b>Active cell</b> or <b>Specific cell</b> option. If you have selected the <b>Specific cell</b>, enter the cell address.</li> <li>• Select or create a string variable to hold the output.</li> </ul>
Go to cell	<p>Goes to the specified cell.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select either the <b>Specific cell</b> or <b>Active cell</b> option. <ul style="list-style-type: none"> <li>• If you have selected the <b>Specific cell</b> option, enter the cell address. For example, B4.</li> <li>• If you have selected the <b>Active cell</b> option, select the direction in which to move from the active cell.</li> </ul> </li> </ul>

Action	Description
Insert row/column	<p>Inserts a blank row or column into a spreadsheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select whether to insert a row or column. <ul style="list-style-type: none"> <li>• If you chose <b>row</b>, select whether to insert the row at a specific index, above the active cell, or in a range.</li> </ul> <hr/> <p><b>Note:</b> The index count begins at 1.</p> <hr/> <li>• If you chose <b>column</b>, select whether to insert the column at a specific address, to the left of the active cell, or in a range.</li> </li></ul>
Open spreadsheet	<p>Opens an existing spreadsheet.</p> <ul style="list-style-type: none"> <li>• Enter a session name. Use this session name in subsequent actions to associate them with this spreadsheet.</li> <li>• Select whether to open the spreadsheet by name, URL, or spreadsheet ID: <ul style="list-style-type: none"> <li>• <b>Name:</b> Enter the file name.</li> <li>• <b>URL:</b> Enter the entire URL.</li> <li>• <b>Spreadsheet ID:</b> The ID is the value in the URL after the last forward slash. For example, if the URL is <code>https://docs.google.com/spreadsheets/d/12dlAwvrEA4JeLysfFky9</code>, the ID is <code>12dlAwvrEA4JeLysfFky9</code>.</li> </ul> </li> <li>• If the spreadsheet contains multiple sheets, select the <b>Specific sheet name</b> option and enter the sheet name.</li> </ul>

Action	Description
Read column	<p>Retrieves data from a column and stores it in a list variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• In the <b>Cell name</b> field, specify the cell location from which to read the values. For example, enter A5 to retrieve all the values located in the first column, below the fifth row.</li> <li>• You can also select the <b>Read full column</b> option to extract values from the entire column.</li> <li>• Select or create a list variable to hold the output.</li> </ul>
Read row	<p>Retrieves data from a row and stores it in a list variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• In the <b>Cell name</b> field, specify the cell location from which to read the values. For example, enter D5 to retrieve the values located in the fifth row and right of the fourth column.</li> <li>• You can also select the <b>Read full row</b> option to extract values from the entire row.</li> <li>• Select or create a list variable to hold the output.</li> </ul>
Set cell	<p>Sets the value of a specific cell.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Enter the address of the cell. For example A5.</li> <li>• Enter the value to set.</li> <li>• Select or create a string variable to hold the value of the cell.</li> </ul>

Action	Description
Write from data table	<p>Writes the contents of a data table variable to a specific spreadsheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the current spreadsheet with the <b>Open spreadsheet</b> action.</li> <li>• Select whether to write to the currently active sheet or to specify a sheet name.</li> <li>• Select the data table variable.</li> <li>• Enter the cell address where to start writing the data.</li> </ul>

## Using the Find action

Use the **Find cells which contain search key** action to find a particular string in a Google sheet.

To find a value in a Google sheet, do the following:

1. Double-click or drag the **Find cells which contain search key** action from the **Google Sheets** node in the **Actions** palette.
2. Enter the same session name that you provided in the **OAuth** action.
3. Select an option from the **From** list to specify a starting point of the cell range for search:
  - **Beginning**: Starts the search from the beginning of the spreadsheet.
  - **End**: Starts the search from the end of the spreadsheet.
  - **Active cell**: Starts the search from the active cell in the spreadsheet.
  - **Specific cell**: Enables you to specify the address of the cell from where you want to start the search.
4. Select an option from the **Till** list to specify an end point of the cell range for search:
  - **Beginning**: Ends the search at the beginning of the spreadsheet.
  - **End**: Ends the search at the end of the spreadsheet.
  - **Active cell**: Ends the search at the active cell in the spreadsheet.
  - **Specific cell**: Enables you to specify the address of the cell where you want to end the search.
5. Select from the following search options:
  - **By rows**: Enables you to search by rows.
  - **By columns**: Enables you to search by columns.
  - **Match by case**: Only performs this action on cells that contain a string that matches the uppercase and lowercase characters of the string you specified in the **Find** field.
  - **Match entire cell contents**: Enables you to find only those cells that contain the entire string you have specified in the **Find** field.
6. Enter the string you want to search for in the **Find** field.
7. Optional: Mark the **Replace** option and enter the string to replace the matching values.
8. Select the list variable of string data type that you want to use to store the output from the **Assign cell addresses variable** list.
9. Click **Save**.

## IBM Watson Authentication package

The **IBM Watson Authentication** package contains actions that enable you to authenticate the API token and location URL for each service, while connecting to and disconnecting from your IBM Cloud account. With this package, you only have to provide your credentials once.

### Before you start

Each service requires a unique API key and location URL. Log in to your IBM Cloud account to create an instance of the service to obtain the API Key and location URL. Automation 360 currently includes *Speech to Text*.

### Actions in the IBM Watson Authentication package

Action	Description
Connect	Establishes a connection with the IBM Cloud account. Insert this action at the beginning of automation sequences that use <b>IBM Watson</b> packages so that you have to input the credentials only once. To use this action, select the services to connect with, then provide the <b>API Key</b> and <b>URL</b> for each service you will use.
Disconnect	Terminates the connection with the IBM Cloud account. Insert this action at the end of automation sequences that use <b>IBM Watson</b> packages.

## IBM Watson Speech to Text package

This package supports the following audio file formats: flac, mpeg, mp3, ogg, pcm, wav, and webm. The following languages are supported: Arabic, Brazilian Portuguese, Chinese (Mandarin), English (United Kingdom and United States), French, German, Japanese, Korean, Spanish (Argentinian, Castilian, Chilean, Colombian, Mexican, and Peruvian).

Feature	Description
Detect speakers	<p>Identifies the individuals in a conversation between multiple people.</p> <ul style="list-style-type: none"> <li>• Supports English, Japanese, and Spanish.</li> <li>• Use for conversation between two people; maximum six people.</li> <li>• For best results, use an audio file at least a minute long.</li> </ul> <p>The output contains the words spoken by each speaker and the timestamp.</p>
Keyword spotting	Detects specific strings in the transcript. The output contains the timestamp(s) for each keyword and a confidence score.

Feature	Description
Smart formatting	<p>Converts the following types of strings into more conventional representations to make the transcript easier to read:</p> <ul style="list-style-type: none"> <li>• Dates</li> <li>• Times</li> <li>• Series of digits and numbers</li> <li>• Phone numbers</li> <li>• Currency values</li> <li>• Email and web addresses</li> </ul> <p>For examples, see <a href="#">Smart formatting results</a>. This feature supports English, Japanese, and Spanish.</p>
Profanity filter	Obscures profanity by replacing it with asterisks in the transcript.

## If package

Use the actions in the **If** package to control the sequence of execution based on one or more conditions of a task.

Use the actions in the **If** package to check if an application is running, a folder or file exists, a variable matches the specified value, an application window exists, or a machine or server is running, before executing a set of actions.

## Actions in the If package

The **If** package includes the following actions:

Action	Description
If	<p>Specifies a condition and holds a sequence of actions to run if the condition is true. See <a href="#">Using If action</a>.</p> <p>You can configure multiple conditions within a single <b>If</b> action.</p> <ol style="list-style-type: none"> <li>1. Click <b>Add condition</b>.</li> <li>2. Select either of the following options: <ul style="list-style-type: none"> <li>• <b>And</b>: Both of the conditions must be met for the actions to run.</li> <li>• <b>Or</b>: Either of the conditions must be met for the actions to run.</li> </ul> </li> <li>3. Select the condition from the drop-down list.</li> </ol>

Action	Description
Else if (optional)	<p>Specifies an alternative condition to test if the condition specified in the <b>If</b> action is false. If this alternative condition is true, the bot runs the sequence of actions contained within the <b>Else if</b> action.</p> <p>You can configure multiple conditions within a single <b>Else if</b> action.</p> <ol style="list-style-type: none"> <li>1. Click <b>Add condition</b>.</li> <li>2. Select either of the following options: <ul style="list-style-type: none"> <li>• <b>And</b>: Both of the conditions must be met for the actions to run.</li> <li>• <b>Or</b>: Either of the conditions must be met for the actions to run.</li> </ul> </li> <li>3. Select the condition from the drop-down list.</li> </ol>
Else	Specifies the alternative sequence of actions if the condition specified in the If action and <b>Else if</b> action (if used) is false.

## Conditions in the If action

Use the following conditions in the **If** action to control the flow of execution in an automation task:

Condition	Description
Application	<p>Use the <b>Application is not running</b> or <b>Application is running</b> condition to execute actions based on whether an application is running or not running.</p> <p>Enter the application path or specify the path using a variable along with the amount of time to wait (in seconds) for the condition to be true.</p>
Boolean	<p>Use the <b>Boolean variable</b> condition to execute actions based on whether a Boolean variable contains the value <b>True</b> or <b>False</b>.</p> <p>You can also use this condition to compare the values of two Boolean variables by selecting the second variable from the <b>Insert a Variable window</b>.</p>
Data table	<p>Use the <b>Data table is empty</b> condition to execute actions based on whether the specified table contains values.</p> <p>Use the <b>Number of rows</b> and <b>Number of columns</b> conditions to execute actions based on whether the number of columns or rows is <b>Equal to</b>, <b>Greater than</b>, or <b>Less than</b> the specified value.</p>
Datetime	Use the <b>Datetime variable</b> condition to execute actions based on whether the value of the source datetime variable is <b>Equal to</b> or <b>Not Equal to</b> , is <b>Greater than</b> or <b>Equal to</b> , or is <b>Lesser than</b> or <b>Equal to</b> the value of the target datetime variable.

Condition	Description
Dictionary	<p>Use the <b>Check key</b> condition to execute actions based on whether the value of the specified key is <b>Equal to</b> or <b>Not equal to</b>, or <b>Contains</b> or <b>Does not contain</b> the target value.</p> <hr/> <p><b>Note:</b> The key comparison is case-sensitive.</p> <hr/> <p>Use the <b>Check for a single value</b> condition to execute actions based on whether a specific key contains the target value.</p>
File	<p>Use the following conditions to execute the action:</p> <ul style="list-style-type: none"> <li>• <b>File date</b> Use this condition to verify the date and time that the specified file was created or modified. Specify a date range using the <b>Is within last</b>, <b>Is between</b>, or <b>Is before</b> options. For the <b>Is within last</b> option, specify the number of days or time (in hours, minutes, and seconds). Enter the amount of time (in seconds) to wait for this condition to be true.</li> <li>• <b>File exists</b> and <b>File does not exist</b> Use these conditions to execute an action based on whether a file exists. For example, if a data file exists, format the file and upload it to a database.</li> <li>• <b>File size</b> This condition verifies if the specified file is larger, smaller, not the same, or the same as the size you specify.  Enter the amount of time (in seconds) to wait for this condition to be true.</li> </ul>
Folder	<p>Use the <b>Folder exists</b> or <b>Folder does not exist</b> condition to execute an action based on whether a folder exists.</p>
Image Recognition	<p>Use these conditions to verify whether:</p> <ul style="list-style-type: none"> <li>• <b>Image file</b> is found in the <b>Image file</b> or not.</li> <li>• <b>Image file</b> is found in the <b>Window</b> or not.</li> <li>• <b>Window</b> is found in the <b>Image file</b> or not.</li> <li>• <b>Window</b> is found in the <b>Window</b> or not.</li> </ul> <p>For the <b>Window</b> conditions, you can use the <b>Resize window</b> option to specify the window dimensions. This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p> <hr/> <p><b>Note:</b> This option is only available for windows that can be resized. It is not available for Desktop or Taskbar options.</p> <hr/>
JavaScript	<p>Use the <b>Script is successful</b> or <b>Script is unsuccessful</b> condition to execute actions based the status of the specified JavaScript. Select the file that contains the script and optionally specify the parameters by selecting a list variable.</p>

Condition	Description
Legacy automation	<p>The <b>Legacy automation</b> conditions are only used in migrated bots to ensure that they run seamlessly in Automation 360. We do <b>not</b> recommend using these conditions for new bot development. The following conditions to verify the following:</p> <ul style="list-style-type: none"> <li>• Whether <b>Web control</b> exists or not.</li> <li>• Whether <b>Window control</b> exists or not.</li> <li>• Whether <b>Window control</b> is active or not.</li> <li>• Whether <b>Script</b> is successful or not.</li> <li>• Whether <b>Child window</b> exists or not.</li> </ul> <p>For the <b>Window control</b> conditions, you can use the <b>Resize window</b> option to specify the window dimensions. This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p>
List	Use the <b>List variable</b> condition to execute actions based on whether the specified list variable contains a particular value. The value can be of <b>Number</b> , <b>String</b> , or <b>Boolean</b> data type.
Number	Use the <b>Number variable</b> condition to execute actions based on whether the specified number variable is <b>Equal to</b> or <b>Not Equal to</b> , or is <b>Greater than</b> or <b>Equal to</b> , or is <b>Lesser than</b> or <b>Equal to</b> a particular value.
Ping	Use the <b>Ping is successful</b> or <b>Ping is unsuccessful</b> condition to verify if a machine or server is running, and execute actions based on the result. Enter the amount of time (in seconds) to wait for the condition to be true.
Recorder	Use this condition to detect an <b>Object</b> in a window. Select a window or variable to capture the object. Enter the amount of time (in seconds) to wait for this condition to be true.
Service	Use the <b>Service is running</b> or <b>Service is not running</b> condition to execute actions based on whether a service is running or not. Select <b>Service list</b> to choose a service from the list of available services.
String	<p>Use the <b>String variable</b> condition to execute actions based on whether the specified source string value is <b>Equal to</b> or <b>Not equal to</b>, or <b>Includes</b> or <b>Does not include</b> the target value.</p> <p>You can select the <b>Match case</b> option to only execute actions if the two strings have matching uppercase and lowercase letters.</p> <p>When you extract text from a Microsoft application, the extracted text contains the <code>/r/n</code> special characters which indicate a new line. Select the <b>Ignore Carriage return</b> option if you want to ignore the <code>/r</code> special character when you compare the text.</p> <p>To create a condition based on whether a string is empty or not empty, compare the source value to an empty target field using the <b>Equal to</b> operator.</p> <p>See <a href="#">Example of using a conditional statement</a>.</p>
Task Bot	Use the <b>Task successful</b> or <b>Task unsuccessful</b> condition to execute actions based on the status of the specified Task Bot.

Condition	Description
VBScript	Use the <b>Script is successful</b> or <b>Script is unsuccessful</b> condition to execute actions based on the status of the specified Visual Basic script. Select the file that contains the script and optionally specify the parameters by selecting a variable.
Window	Use the <b>Window exists</b> or <b>Window does not exist</b> condition to verify if a specific application window is open by entering the <b>Window title</b> or using a variable. Enter the amount of time (in seconds) to wait for the condition to be true.  Use the <b>Window with same title does not exist</b> or <b>Window with same title exist</b> condition to verify whether a window with the same title exists or whether the window title has changed. Enter the amount of time (in seconds) to keep verifying if the condition is true.

## Example

*Build a basic bot that uses a desktop application*

An example of how to build a basic TaskBot that uses the If package.

## Using If action

Use the **If Else If** and **If Else** actions to change the flow of execution in an automation task based on certain conditions.

To use the actions in the **If** package, do the following:

1. Double-click or drag the **If** action from the **If** package in the **Actions** palette.
2. Select the required condition from the **Condition** list.  
See *If package* for a list of available conditions.
3. Drag the actions to be executed if the condition is satisfied within the **If** condition.
4. Double-click or drag the **Else If** action from the **If** package in the **Actions** palette to include alternative actions to run if the condition for the **If** action is false, and if the condition for the **Else If** action is true.
5. Drag the actions to be executed if the condition is satisfied within the **Else If** condition.
6. Double-click or drag the **Else** action from the **If** package in the **Actions** palette to include actions to run if the conditions for the **If** and **Else If** actions are false.
7. Drag the actions to be executed if the condition is satisfied within the **Else** condition.
8. Click **Save**.

## Image Recognition package

The **Image Recognition** package contains actions that enable you to search for a user interface (UI) element in an application based on an image to automate a task in that application.

### Actions in the **Image Recognition** package

Use these actions to automate a task when it is not possible to capture UI elements of applications that are:

- Exposed over Citrix
- Accessed using the Remote Desktop Protocol (RDP)
- Developed using legacy technology

Image recognition is also useful when object-based recognition does not work or is unreliable. For example, you can use an image to search for the **Close** button in an application and perform a left-click operation.

The **Image Recognition** package contains the following actions:

Action	Description
Find image in window	See <a href="#">Using Find image in window action.</a>
Find window in window	See <a href="#">Using the Find window in window action.</a>

## Logging and debugging

If a bot fails while running one of the Image Recognition actions, the captured source and target images are stored in the log folder. Use the images to identify issues such as the application image not captured correctly or low quality of the image due to differences in the Bot Creator and Bot Runner devices.

---

**Note:** When secure recording is ON and Image Recognition fails, the bot does not store images in the log folder.

---

Navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\IR` to view the captured application images. The folder stores a maximum of 10 source and target image pairs. When the maximum is reached, the oldest image pairs are overwritten with new images.

## Secure Recording

When secure recording mode is enabled, bots do not capture object images or values. This ensures that sensitive data is not stored in the bots.

When you record a task in secure recording mode, the **Preview** window temporarily shows the captured area. This image is deleted after you navigate away from the action editor window.

A user with admin privileges must enable this setting. See [Settings](#).

## Using Find image in window action

Use the **Find image in window** action to search for a UI element in an application window (haystack) using a target image (needle). The target image is an existing image that you can use to search for a UI element.

To find an image inside an application window, follow these steps:

1. Double-click or drag the **Find image in window** action from the **Image Recognition** package in the **Actions** palette.

2. Specify the window in which you want to find the image:

Choose from the **Application**, **Browser**, or **Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows. This option shows a list of all the application and browser windows that are open on the Bot Creator device.
<b>Browser</b>	Select from a list of Google Chrome tabs that are currently open on the Bot Creator device.  <b>Note:</b> Currently, this option only supports Google Chrome tabs. For all other browsers, use the <b>Application</b> option.
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.

Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value. For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad)` for all the window title names starting with `((\w*)-Notepad)`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

3. Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

4. Click **Capture region**.

The selected window appears.

5. Drag the mouse to select the area and right-click when done.

The captured area appears in the **Preview** section with the image coordinates underneath.

6. In the **Wait before capturing the image (ms)** field, specify the delay (in milliseconds) before searching for the image.

- Specify the target image (needle) that you want to find in the application window.

---

**Recommendation:** Store the target image file in the Control Room along with the bots. This helps you to search for a user interface control or element in an application window using the stored target image.

---

- **Control Room file:** Uses an image file that is available on the Control Room.
  - **Desktop file:** Uses an image file that is available on your device.
  - **Variable:** Uses a file variable to specify the location of the image file you want to use.
- 

**Note:** Images of .jpeg, .jpg, .jpe, .jfif, .bmp, .png, and .gif formats are supported.

---

- In the **Image occurrence** field, enter a value to specify the occurrence of the target image on which you want to perform this action.

- In the **Match percentage** field, specify the acceptable percentage of matching pixels between the two images.

For example, if you specify 20 in the field as the match percentage, the system considers the images as matching even if there is up to 80% of pixel mismatch between the two images.

- Select a click action:

- **Click match:** During runtime, the bot clicks in the center of the matched image.
  - **Offset from match:** During runtime, the bot clicks in the specified offset coordinates.
- 

**Note:** The offset coordinates measure the number of pixels from the top left corner of the image.

---

- Select an option from the **Action** list to specify the action you want to perform on the matched image in the application window.
- Optional: Select the **Repeat if image not found** check box if you want the system to retry searching for the target image if it is not found.
  - In the **Times** field, specify the number of times the system must repeat the process to find the target image.
  - In the **Wait between repeats** field, specify the time period the system must wait before repeating the process of finding the target image.

- Click **Save**.

## Using the Find window in window action

Use the **Find window in window** action to search for a UI element in an application window using a screenshot of a window. This action enables you to capture an image of a UI element in an application and use the captured image to search for that UI element in another window.

To use an image available in an application window to find an image in another application window, follow these steps:

- Double-click or drag the **Find window in window** action from the **Image Recognition** package in the **Actions** palette.

2. Specify the window in which you want to find the image:

Choose from the **Application**, **Browser**, or **Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows. This option shows a list of all the application and browser windows that are open on the Bot Creator device.
<b>Browser</b>	Select from a list of Google Chrome tabs that are currently open on the Bot Creator device.  <b>Note:</b> Currently, this option only supports Google Chrome tabs. For all other browsers, use the <b>Application</b> option.
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.

Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value. For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad` for all the window title names starting with `((\w*)-Notepad`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

3. Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

4. Click **Capture region**.

The selected window appears.

5. Drag the mouse to select the area and right-click when done.

The captured area appears in the **Preview** section with the image coordinates underneath.

6. Specify the target image (needle) that you want to find in the application window.
  - **Captured image:** Enables you to capture the image relative to the screen or window.
 

If you select **Captured image**, perform steps 7 through 9. Otherwise, skip to step 10.
  - **Control Room file:** Uses an image file that is available on the Control Room.
  - **Desktop file:** Uses an image file that is available on your device.
  - **Variable:** Uses a file variable to specify the location of the image file you want to use.

---

**Note:** Images of .jpeg, .jpg, .jpe, .jfif, .bmp, .png, and .gif formats are supported.

---

7. Specify whether to capture the image relative to the screen or window.
 

Use the **Window** option when you work with varying screen resolutions (for example, a dual monitor).
8. Click **Capture image** to capture the target image.
9. Drag the mouse pointer over an area of the application window.
 

The captured area appears in the **Preview** section.
10. In the **Image occurrence** field, enter a value to specify the occurrence of the target image on which you want to perform this action.
11. In the **Match percentage** field, specify the acceptable percentage of matching pixels between the two images.
 

For example, if you specify 20 in the field as the match percentage, the system considers the images as matching even if there is up to 80% of pixel mismatch between the two images.
12. Select a click action:
  - **Click match:** During runtime, the bot clicks in the center of the matched image.
  - **Offset from match:** During runtime, the bot clicks in the specified offset coordinates.

---

**Note:** The offset coordinates measure the number of pixels from the top left corner of the image.

---

13. Select an option from the **Action** list to specify the action you want to perform on the matched image in the application window.
14. Optional: Select the **Repeat if image not found** check box if you want the system to retry searching for the target image if it is not found.
  - a) In the **Times** field, specify the number of times the system must repeat the process to find the target image.
  - b) In the **Wait between repeats** field, specify the time period the system must wait before repeating the process of finding the target image.
15. Click **Save**.

## Interactive forms package

The interactive forms package contains actions that handle exceptions encountered by a bot. All the actions performed by users on the interactive forms can be monitored to execute logic using subtasks.

Interactive forms are first-class citizens within the bot repository and have the same workflows for moving forms between public and private workspaces, and for export or import actions. Handling exceptions ensures that a bot completes a task when it encounters an error.

## Actions in the Interactive forms package

The interactive forms package includes form-level and element-level actions.

The following actions are available at the form level:

Action	Description
<b>Display</b>	<p>Load and display the selected form.</p> <p>Select or insert a variable in the <b>Form name</b> field to display the form when an event is triggered. Optionally, select the check box to always display the form window in front.</p>
<b>Close</b>	Closes the selected form.
<b>Show</b>	<p>Loads or displays a hidden form.</p> <p>Select or insert a variable in the <b>Form name</b> field for a hidden form, which is displayed on the desktop when an event is triggered.</p>
<b>Hide</b>	Hides the selected form from the user's view.
<b>Reset</b>	<p>Resets the selected form to its default value.</p> <p>Select or insert a variable in the <b>Form name</b> field for a form. All the values of this specified form are reset when an event is triggered.</p>
<b>Validate form</b>	<p>Validates all the elements within the selected form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field for a specific form, which is validated when an event is triggered.</li> <li>• Select the next event by creating or selecting a variable using the <b>Assign the return value to a boolean variable</b> field.</li> </ul> <hr/> <p><b>Note:</b> The <b>Validate form</b> action is not applicable to <b>Rich Text Editor</b> elements.</p> <hr/>
<b>Change Form Title</b>	<p>Changes the title of the selected form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field for a specific form.</li> <li>• Enter the new title that must appear for the selected form in the <b>New Title (optional)</b> field.</li> </ul>

The following actions are available at the element level:

Action	Description
<b>Assign</b>	<p>Assigns dynamic values to the <b>Dropdown</b> element of a form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field.</li> <li>• Select the <b>Dropdown</b> element of the form from the <b>Form element</b> field, which is enabled when an event is triggered.</li> <li>• Use <b>Assign</b> to set one of the following actions: <ul style="list-style-type: none"> <li>• <b>Append</b>: Specified values or variables are added to the selected <b>Dropdown</b> element.</li> <li>• <b>Overwrite</b>: Specified values or variables replace the existing data in the selected <b>Dropdown</b> element.</li> </ul> </li> </ul>
<b>Enable</b>	<p>Enables the specified element of the selected form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field.</li> <li>• Select a specific element of the form from the <b>Form element</b> field, which is enabled when an event is triggered.</li> </ul>
<b>Disable</b>	<p>Disables the specified element of the selected form.</p>
<b>Get</b>	<p>Retrieves the value from the specified element of the selected form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field and use the <b>Form element</b> to select a specific element of the form.</li> <li>• Use the <b>Returns the value</b> drop-down menu to assign this value to a variable when an event is triggered.</li> </ul> <p><i>Create a variable</i></p>
<b>Set</b>	<p>Assigns the user-defined or global variable to the selected element of the specified form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field and use the <b>Form element</b> to select a specific element of the form.</li> </ul> <p>If you select <b>Table</b> as the <b>Form element</b>, use the <b>Set Value Type</b> to enable the following additional options:</p> <ul style="list-style-type: none"> <li>• <b>Table</b>: Sets the variable value to the entire table.</li> <li>• <b>Row</b>: Sets the variable value to the selected row.</li> </ul> <ul style="list-style-type: none"> <li>• Use the <b>Input value</b> to assign a user-defined or system variable into this element when an event is triggered.</li> </ul>
<b>Set focus</b>	<p>Sets the focus on the selected element of a form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field.</li> <li>• Use the <b>Form element</b> to select the specific element of the form and set the focus: <ul style="list-style-type: none"> <li>• For form elements such as a text box, text area, number or date, the cursor appears on the element.</li> <li>• For form elements such as a check box or radio button, the emphasis is on the first option.</li> </ul> </li> </ul>

Action	Description
<b>Highlight</b>	<p>Highlights the specified element of the selected form.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field.</li> <li>• Use the <b>Form element</b> to select the specific element of the form to highlight it when an event is triggered.</li> <li>• Use the <b>Highlight Type</b> drop-down menu to select one of the following: <ul style="list-style-type: none"> <li>• <b>Warning</b>: Displays a warning alert on the specified form element.</li> <li>• <b>Error</b>: Displays an error alert on the specified form element.</li> </ul> </li> </ul>
<b>Unhighlight</b>	Removes the highlight from the specified element of the selected form.
<b>Change label</b>	<p>Changes the label of the selected form element.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field.</li> <li>• Use the <b>Form element</b> to select the specific element of the form for which the label must change when an event is triggered.</li> <li>• Enter the name in <b>New label</b> field.</li> </ul>
<b>Dynamic area</b>	
<b>Add row in Dynamic area</b>	<p>Applies only to forms that have a <b>Dynamic</b> element. This action renders the selected form field as a single row when the bot starts.</p> <ul style="list-style-type: none"> <li>• Select or insert a variable in the <b>Form name</b> field.</li> <li>• Use the <b>Dynamic area</b> drop-down menu to select the dynamic element of the form.</li> <li>• Use <b>Append</b> or <b>Overwrite</b> to add a row for the specified dynamic area.</li> <li>• Use <b>Add element</b> to insert elements into the dynamic area. <ul style="list-style-type: none"> <li>• Use the <b>Type</b> drop-down menu to select the element type such as Checkbox group, Drop-down, File, Radio group, Snapshot, Text area, or Textbox.</li> <li>• Use the <b>Label</b> field to enter a name for the element.</li> <li>• Click <b>Add</b> to add the element.</li> </ul> </li> </ul> <p>You can add up to four elements.</p>
<b>Clear</b>	Clears all the dynamic elements in the specified form.

## IQ Bot (Preview) package

Use the IQ Bot (Preview) package to process and validate documents using IQ Bot with Auto-extraction.

---

**Note:** This package is available for IQ Bot Community Edition from A2019.16.

---

### Before you start

Before you start using the actions, create a learning instance.

[Create a learning instance in Automation 360 IQ Bot](#)

## Actions in the IQ Bot (Preview) package

The package includes the following actions:

Action	Description
Document extraction	See <a href="#">Using Document Extraction action</a>
Validation	See <a href="#">Using Validation action</a>

### Using Document Extraction action

Use the Document Extraction action to process documents using TaskBots created in the Control Room.

Create a bot, and then use the **IQ Bot (Preview) > Document Extraction** action to process your documents and extract data from the production-document fields and tables.

This action extracts documents using IQ Bot with Auto-extraction.

1. Navigate to **Bots > My bots** and click **Create a bot**.
2. In the **Create Task Bot** window, enter a name and click **Create & edit**.
3. The bot designer window appears.
4. In the **Edit Task Bot > Actions** column, search for IQ Bot to display the available actions.
5. Drag the **IQ Bot (Preview) > Document Extraction** action into your workflow.
6. In the **Input File Path** field, use **Browse** to navigate to the file you want to process.
7. From the drop-down list, select your learning instance.

---

**Recommendation:** Do not use the **Learning Instance configuration file** option because this is used for backward-compatibility only and will be deprecated in upcoming versions of the product.

---

8. In the **Assign the status to the output variable** field, select **prompt-assignment – String** from the drop-down list.  
The action response code is saved in the provided variable.
9. Optional: Drag the **Message box** action to display results in the message box. Define the message you want to see displayed in the message box.
  - a) Click the **Insert a value (F2)** icon in the **Enter the message to display** field.
  - b) In the **Insert a value** dialog box, select **prompt-assignment - String** from the drop-down list and click **Yes, insert**.
10. Click **Save** and then click **Run** to run the bot.

If all fields are extracted, and the value has a high confidence, the system sends the successfully extracted data to the output folder, specified during learning instance creation, and the `Success` sub folder for successfully processed documents; while failed documents are sent to a different folder for validation. The status of the data extraction is updated in Bot Insight and is reflected in the **Learning Instance** page.

### Using Validation action

Use the Validation action to dynamically generate the form for validating a document against the learning instance.

This action initiates a verification process for the specified learning instance.

1. Navigate to **Control Room > Bots > My Bots**, and click **Create new > Bot**.
2. In the **Create Task Bot** window, add a name, description (optional), and specify the folder to save the bot.

3. Click **Create & edit** to create a bot.  
The **Edit Task Bot** window appears with your bot displayed.
4. From the **Actions** palette, double-click or drag **IQ Bot (Preview) > Validation** action into your workflow.
5. In the right-side pane, select the learning instance from the drop-down list.
6. Click **Save**, and then click **Run** to run the bot.

The system displays an interactive form with a document and extracted data for validation.

## IQ Bot Classifier package

Use the IQ Bot Classifier package to group or classify documents into appropriate learning instances for content extraction in Automation 360 IQ Bot.

---

**Note:** This package is not available as part of the standard Automation 360 IQ Bot installation. To download and install this package, perform these steps:

1. Download the package from the Automation Anywhere support site:

[A-People Downloads page \(Login required\)](#)

The package is a `.jar` file available in the IQ Bot installation folder.

2. Upload the package to Control Room.

[Add packages to the Control Room](#)

After installation, administrator can locate the package in Automation 360: **Manage > Packages**.

---

To use your existing bots, you must also add the license when prompted. This package has the following requirements:

- User must be assigned the IQ Bot Classifier license.
- A Bot Runner user must be associated with role that has **Administration > View License** permission enabled.

[Create and assign roles](#)

## Actions in the IQ Bot Classifier package

The package contains the **Classify** and **Train Classifier** actions. You can use these actions to create a model file, and use the file to classify uploaded documents into different folders. These actions work as a precursor to document processing.

The **Classify** action groups the document pages into various categories, making it is easy for you to send each classified group for document processing and ensuring the documents are not placed in unclassified output folders.

Actions	Description
Classify	See <a href="#">Using Classify action</a>
Train Classifier	See <a href="#">Using Train Classifier action</a>

Watch the following video to understand how to use the IQ Bot Classifier package:

## Using Classify action

IQ Bot Classify action groups the input document into various categories based on the selected model file that is created using IQ Bot Train Classifier action.

As multi-page documents in `.tiff` format are not supported in the **Classify** action, ensure that these are converted to `.pdf`. Note that multi-page `.tiff` documents are supported for training.

1. In the **Actions** palette, double-click or drag the **Classify** action from the **IQ Bot Classifier** package.
2. Select the input file from **Control Room file**, **Desktop file** or **Variable**.
3. Click **Browse** to change the default filepath.
4. Click **Classifier** to select the filepath of the model file or click **Browse** to change it.

You can either select the `.zip` folder or extract the `.icmf` file from this folder and select it.

5. Use the **Output folder path** option to save the classification output document.  
The pages from the output document are saved in the respective subfolders based on the categories created in the model file.
6. Optional: Configure the following **ADVANCED SETTINGS**:
  - **Confidence threshold (%)**: If the confidence value of the category prediction of a page is less than the confidence threshold, it is moved to the `Unclassified` folder.
  - **Save classification output variable**: Save the classification results as a list of dictionaries with the following keys:
    - `fileName`
    - `pageIndex`
    - `category`
    - `confidence`

---

**Note:** For better classification results and performance, we recommend that you use the `.icmf` file available in the `.zip` folder obtained from the **Train Classifier** action.

---

## Using Train Classifier action

Use the **Train Classifier** action to create a model file that is used by the **Classify** action to sort the documents into required categories for input.

Ensure the action meets the following minimum requirements:

- Has at least two categories or subdirectories.
- A minimum of 15 pages per category (20 pages recommended).

If these minimum requirements are not met, an error message is displayed during bot runtime.

1. In the **Actions** palette, double-click or drag the **Train Classifier** action from the **IQ Bot Classifier** package.
2. Click **Train** to continue creating a new model file.
3. Optional: If you have an existing model file, click **Re-Train**.
  - a) Use the **Training folder path** field to select an existing folder path from the **Desktop folder** tab.  
Alternatively, click the **Variable** tab to manually enter an existing training folder path.
  - b) Use the **Existing zip path** field to select the filepath of the `.zip` folder from **Control Room file** or **Desktop file** tab.

Alternatively, click the **Variable** tab to manually enter the path for the `.zip` folder.

---

**Note:** When you train documents, a `.zip` folder is created, which contains `.icmf`, `.data` and `.properties` files. Ensure you upload the entire `.zip` folder for retraining an existing model file.

---

4. Select the input folder path from **Desktop folder** or **Variable**.

---

**Note:** The input folder path must have subdirectories with the names that correspond to the category of the documents that you want to train the classifier on. For example, if you have sales-related documents, the input folder path must have subfolders such as `Invoice` and `Purchase Order`.

---

5. Optional: If you select **Desktop file**, click **Browse** to change the default filepath.
6. Enter a name for the model file in the **Model name** field.
7. Use the **Model output path** field to select the directory for the output model file.
8. Optional: Configure the following **ADVANCED SETTINGS**:
  - a) **Training Optimization:** Use the drop-down menu to select the type of training optimization.
    - **Precision:** select this option when you want your training model to be precise but can miss out on few documents.
    - **Recall:** select this option when you want the training model to find all the relevant cases within a dataset.
    - **F1 score:** is selected by default and the recommended setting as it combines the training optimization of both **Precision** and **Recall**.

**F1 score** is the selected by default. **Precision** and **Recall**.
  - b) **Classification Type:** Use the drop-down menu to select the features you want to include such as text, image, or both.
 

**Text and image** is selected by default.
  - c) **OCR Settings:** The **Extract all text blocks** and **Extract text from images** are enabled by default.
9. Click **Save**.  
A model file is created in the directory specified using the **Model output path** field.

## IQ Bot [Local Device] package

Use the IQ Bot [Local Device] package to leverage your existing pool of RPA devices and process documents using multiple Bot Runners, without having to manage a separate IQ Bot cluster setup.

---

**Note:** This package is available on demand for On-Premises users. Contact your Automation Anywhere representative to request for the IQ Bot [Local Device] package. You have to upload this package to Control Room. For cloud users, it will be available as a pre-installed package.

*[Add packages to the Control Room](#)*

---

## Before you start

IQ Bot [Local Device] package helps you scale by processing documents on multiple devices simultaneously using a device pool. You can set this up using workload management (WLM) in the Control Room.

### *Workload management*

- If you are using a device pool, then you have to set up a shared file system so that all the Bot Runners can process and store documents at the same location.
- This command performs parallel processing at the folder level, so you have to set up input files in separate folders.
- You must have the IQ Bot Services role along with the Bot Runner role to run bots in production. This is required so that the Bot Runner can access the IQ Bot server when using a device pool.
- The package does not create new groups and the documents that do not match the existing groups are sent to IQ Bot Validator on the IQ Bot server.

## Actions in the IQ Bot [Local Device] package

The package includes the following action:

Action	Description
Process Documents	See <a href="#">Using Process Documents action</a>

## Using Process Documents action

Use the action to process documents using TaskBots created in the Control Room.

1. In the **Actions** palette, double-click or drag the **Process Documents** action from the **IQ Bot [Local Device]** package.
2. In the right-side pane, select the learning instance from the drop-down list.  
You can click the refresh option to view the updated list.  
Only the ABBYY FineReader Engine and Tesseract4 OCR engines are currently supported.
3. Enter the **Input documents folder path**.
  - Enter the folder path as text or choose a folder using the **Browse** option.
  - Either enter a variable name or click **Variable** to select a variable from the list.
4. Enter the **Output folder path** path.
  - Enter the folder path as text or choose a folder using the **Browse** option.
  - Either enter a variable name or click **Variable** to select one from the list.
5. Select the **Validator settings** check box if you want to review documents in the IQ Bot Validator.  
When you enable this setting, documents are stored in the IQ Bot server's output path. To download documents back to your local device, use the **Download all documents** action in the IQ Bot package.

### *Download all documents action*

The following types of documents are sent to the IQ Bot Validator:

- Failed documents (exceptions)
- Unclassified documents

- Documents that do not belong to any group

---

**Note:** If you do not want to use the IQ Bot Validator, do not enable this setting. You can build your own Validator using Interactive forms and the dashboards on Bot Insight.

[Using interactive forms](#)

---

6. Click **Save**.

## IQ Bot Pre-processor package

Use the IQ Bot Pre-processor package to extract content from documents or process image files before they are sent to Automation 360 IQ Bot.

---

**Note:** This package is not available as part of the standard Automation 360 IQ Bot installation. To download and install this package, perform these steps:

1. Download the package from the Automation Anywhere support site:

[A-People Downloads page \(Login required\)](#)

The package is a `.jar` file available in the IQ Bot installation folder.

2. Upload the package to Control Room.

[Add packages to the Control Room](#)

---

After installation, administrator can locate the package in Automation 360: **Manage > Packages**.

Ensure that the Windows Media Foundation platform is installed on your Bot Runner machine in order to use the following commands without any errors.

## Actions in the IQ Bot Pre-processor package

The following table lists the actions used for processing image file:

Actions	Description
<b>ConcatenateImages</b>	See <a href="#">Using ConcatenateImages action</a>
<b>ConvertImageToPDF</b>	See <a href="#">Using ConvertImageToPDF action</a>
<b>EditImage</b>	See <a href="#">Using EditImage action</a>
<b>EnhanceImage</b>	See <a href="#">Using EnhanceImage action</a>
<b>OrientImage</b>	See <a href="#">Using OrientImage action</a>

The following table lists the actions used for extracting content from documents:

Actions	Description
<b>GetBarCodes</b>	See <a href="#">Using GetBarCodes action</a>
<b>GetDocumentInfo</b>	See <a href="#">Using GetDocumentInfo action</a>
<b>GetPageContent</b>	See <a href="#">Using GetPageContent action</a>

## Using ConcatenateImages action

Use the **ConcatenateImages** action in the IQ Bot Pre-processor package to link two image files.

1. Drag the **IQ Bot pre-processor > ConcatenateImages** action into your workflow.
2. Use the **Input file path 1** field to select the first input file from **Control Room file, Desktop file** or **Variable**.
3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.
4. Use the **Input file path 2** field to select the second input file.
5. Select the output folder from the **Output Path** field.
6. Optional: Click **Browse** to change the default output filepath.
7. Use the **Concatenate Type** field to select one of the following options:
  - **Vertical**: To vertically concatenate or link the selected images.
  - **Horizontal**: To horizontally concatenate or link the selected images.
8. Optional: Use the **Assign output status to variable** field to set the output status of action during bot runtime.
9. Click **Save**.  
When the bot runs successfully, the combined image file is saved in the specified output folder.

## Using ConvertImageToPDF action

Use the **ConvertImageToPDF** action in the IQ Bot Pre-processor package to convert a selected image file to a text-enabled PDF document. The converted PDF file retains the name of the input image file by default.

1. Drag the **IQ Bot pre-processor > ConvertImageToPDF** action into your workflow.
2. Select the input file from **Control Room file, Desktop file** or **Variable**.
3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.
4. Use the **Output Path** field to select the output folder for the PDF document.
5. Optional: Click **Browse** to change the default output filepath.
6. Optional: Choose from the following advance settings:
  - **Input file settings**: Use this field to select various input file settings.  
For example, if the input file is a legal document (a bank check), select the **Has MICR** check box.
  - **Process settings**: Use this field for processing the output file.  
For example, select the **Process text blocks independently** check box if the OCR engine must process various blocks of the input file as a specific text type.
7. Optional: Use the **Save the output status of the action as boolean** to set the output status.
8. Click **Save**.  
When the bot runs successfully, the processed PDF file is saved in the specified output folder.

## Using EditImage action

Use the **EditImage** action in the IQ Bot Pre-processor package to resize an image file.

1. Drag the **IQ Bot pre-processor > EditImage** action into your workflow.
2. Select the input file from **Control Room file, Desktop file** or **Variable**.

3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.
  4. Use the **Output Path** field to select the output folder.
  5. Optional: Click **Browse** to change the default output filepath.
  6. Use the **Select Image Edits** drop-down menu to select one of the following options:
    - **Crop**: Use an auto-crop or manual option to crop the image.
    - **Resize**: Change the height and width of the image.
  7. Optional: Use the **Assign output status to variable** field to set the output status of action during bot runtime.
  8. Click **Save**.
- When the bot runs successfully, the edited image file is saved in the specified output folder and is suffixed by the word *processed*.

For example, if the image filename is `Sales.png`, the processed file is saved as `Sales_processed.png`

## Using GetBarCodes action

Use the **GetBarCodes** action in the IQ Bot Pre-processor package to detect and extract all available barcodes from a document.

1. Drag the **IQ Bot pre-processor > GetBarCodes** action into your workflow.
2. Select the input file from **Control Room file**, **Desktop file** or **Variable**.
3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.
4. Use the **List of dictionaries with 7 keys** drop-down menu to select the output format for the extracted strings.

If the document has multiple barcodes, multiple dictionaries are used as each dictionary corresponds to a single barcode. Each dictionary has the following seven keys that relate to the various attributes of the barcode in a document:

- Page number of the document where a barcode is available
  - Type of the barcode
  - Value of the barcode
  - X coordinate of the barcode
  - Y coordinate of the barcode.
  - Width of the barcode
  - Height of the barcode
5. Click **Save**.
- When the bot runs successfully, the extracted barcodes are assigned to the output variable.

## Using GetDocumentInfo action

Use the **GetDocumentInfo** action in the IQ Bot Pre-processor package to extract document information such as the page count and extension type.

1. Drag the **IQ Bot pre-processor > GetDocumentInfo** action into your workflow.
2. Select the input file from **Control Room file**, **Desktop file** or **Variable**.
3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.

4. Use the **Dictionary object with 5 keys** drop-down menu to select the output format for the extracted information.

Each dictionary has the following five keys that relate to the various attributes of the document:

- Filepath of the document location
- Extension type of the document
- File type of the document
- Total number of pages in the document
- File size of the document

5. Click **Save**.

When the bot runs successfully, all the extracted information for the selected document is assigned to the output variable.

## Using GetPageContent action

Use the **GetPageContent** action in the IQ Bot Pre-processor package to extract text from a specific page of a document (PDF, image file) into a list of strings.

1. Drag the **IQ Bot pre-processor > GetPageContent** action into your workflow.
2. Select the input file from **Control Room file**, **Desktop file** or **Variable**.
3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.
4. Enter the page number of the selected document from which the content must be extracted.
5. Use the **List of strings extracted from page** drop-down menu to select the output format for the extracted strings.

You can use this menu to create a variable with **Type > List** and **Subtype > String**. Alternatively, you can select an existing variable with **Type > List**, and **Subtype > String** or **Subtype > Any**.

6. Click **Save**.

When the bot runs successfully, the content extracted from the specific page of the selected document assigned to the output variable.

## Using EnhanceImage action

Use the **EnhanceImage** action in the IQ Bot Pre-processor package to enhance a selected image file.

1. Drag the **IQ Bot pre-processor > EnhanceImage** action into your workflow.
2. Select the input file from **Control Room file**, **Desktop file** or **Variable**.
3. Optional: If you selected **Control Room file** or **Desktop file**, click **Browse** to change the default filepath.
4. Use the **Output Path** field to select the output folder.
5. Optional: Click **Browse** to change the default filepath.
6. Click the **Add effect** for additional effects.

For example, if you want to enhance an image:

- Select **Effect type > SHARPEN**.

Additional fields such as Gaussian blur, Alpha, Beta and Gama are displayed.

- Enter 5 in the **Alpha** field.

Value between 0 to 10 can be used in the additional fields, with higher value for better enhancement. Optionally, you can also press F2 or click **Insert a value** option to select a system value.

The selected enhancement options are listed in the **Effect type** field, and you can edit or delete a specific effect type.

7. Click **Add**.
8. Optional: Use the **Assign output status to variable** field to set the output status of action during bot runtime.
9. Click **Save**.  
When the bot runs successfully, the enhanced image file is saved in the specified output folder.

## Using OrientImage action

Use the **OrientImage** action in the IQ Bot Pre-processor package to change the orientation of a selected image file.

1. Drag the **IQ Bot pre-processor > OrientImage** action into your workflow.
2. Select the input file from **Control Room file**, **Desktop file** or **Variable**.
3. For the **Control Room file** and **Desktop file** tabs, click **Browse** to change the default filepath.
4. Use the **Apply settings** field to change the following orientation options:
  - **Flip**: Use the drop-down menu to flip the image horizontally, vertically, or horizontally and vertically.
  - **Rotate**: Use the drop-down menu to:
    - Rotate the image clockwise or anti-clockwise.
    - Change the angle of the image.

For example, enter 45 if you want to change the image angle by 45 degrees.

5. Click **Save**.  
When the bot runs successfully, the modified image file is saved in the specified output folder.

## IQ Bot Extraction package

The IQ Bot Extraction package provides enhanced content extraction capability by automatically extracting values from invoices.

Learning instance is an IQ Bot environment that enables you to train sample documents for content extraction. By constantly refining the learning instance, you can achieve a high content extraction accuracy before deploying the learning instance across a production environment.

IQ Bot Extraction package combines learning instance (new or existing) and a pretrained machine learning model to automatically extract content. The pretrained machine learning model uses data points to extract content from the supported document types. By providing additional training to an existing learning instance, you can extract content from other document types as well.

IQ Bot Extraction package provides the following extraction methods:

### Content extraction with minimum training

The IQ Bot Extraction package is designed to extract values with minimum training from specific document type such as an invoice or purchase order.

---

**Note:** For this content extraction method, ensure you always use the ABBYY FineReader Engine OCR 12.4 engine.

---

Consider a scenario where you want extract sales data from various invoices. Create a learning instance by selecting a pretrained domain or document type used to extract data. In this scenario, you can select

the document type as invoice, which provides a set of preset fields for content extraction. Ensure you upload a sample invoice document as a reference. Additional training of the learning instance group is not required. Use the IQ Bot Extraction package to link this learning instance to a bot. You can then run this bot to retrieve sales data based on the preset fields for various invoices.

### Enhanced extraction with additional training

The IQ Bot Extraction package uses a combination of backend engine with IQ Bot server for enhanced document extraction. You can use an existing learning instance to provide additional training for all the available document groups. By customizing the various fields and validation settings of the learning instance group, you can use this package content extraction across other document types.

**Important:** This package is not available as part of the standard Automation 360 IQ Bot installation. To download and install this package, perform these steps:

1. Download the package from the Automation Anywhere support site. The package is a `.jar` file available in the IQ Bot **Installation Setup** folder.

[A-People Downloads page \(Login required\)](#)

2. Upload the package to Control Room.

[Add packages to the Control Room](#)

### Before you start

- Ensure you create a learning instance using ABBYY FineReader Engine OCR 12.4 engine.

Other OCR engines available are:

- Tesseract4 OCR
- Microsoft Azure Computer Vision OCR engine 3.2
- Tegaki (not available for Automation 360 IQ Bot Cloud)
- Select documents with common layouts.

The pretrained model contains logical group. It is important to select an existing group for default validation rules to avoid documents with errors in the `Success` folder.

### Action in the IQ Bot Extraction package

The following action is available to build a bot for extracting data:

Action	Description
IQ Bot Extraction	See <a href="#">Using IQ Bot Process documents action</a> .

Watch the following video to understand how to use the IQ Bot Extraction package:

### Related tasks

[Create a learning instance](#)

### Using IQ Bot Process documents action

Use this action to extract values from invoices using a pretrained model.

1. Drag the **Process documents** action into your workflow.

2. Use the **Learning instance name** drop-down menu to select a learning instance.  
Ensure you have created a learning instance.
3. Select one of the following tabs for the input documents:
  - **Desktop folder:** Enter the folder path as text browse and choose a folder.
  - **Variable:** Enter a variable name or browse to select a variable from the list.
4. Select the folder (instead of a single document) that has all the documents that must be processed.
5. Select the output folder from the **Output folder path** field.
6. Optional: Select the **Send documents to IQ Bot Validator for validation** check box.  
Although the documents are processed using Bot Runners on your local machine, you must use this option if you want to validate the documents in the IQ Bot Validator.
7. Click **Save**.

After the TaskBot is run, the output folder can have up to four subfolders:

- **Success:** Contains documents that the package successfully extracted all the fields from and appear as `.csv` files.
- **Validate:** Contains documents that require validation.

The documents appear as `.csv` files and IQ Bot extracts the data before you validated it. However, if you select this option, these documents will be available in the Validator and you can download the validated output separately.

- **Retrain:** Contains documents that were sent for validation.

These documents are stored in their original input format and you can train them by uploading them to your existing learning instance. The package does not create new groups. To create new groups and train the failed documents, use the **Upload** option to send the documents from the `Output\Retrain` folder to your learning instance. The groups are created based on the **Groups Creation Threshold** defined in the learning instance.

- **Unprocessed:** Contains documents that were not processed due to runtime errors.

These documents are stored in their original input format and you can process them using the IQ Bot Extraction package.

If you use the IQ Bot Validator, the validated files are stored on the IQ Bot server output folder. Use the **IQ Bot: Download all documents** action to download files to your output folder on the local device.

## IQ Bot package

The **IQ Bot** package enables you to upload and download documents from an IQ Bot server.

### Actions in the IQ Bot package

The **IQ Bot** package includes the following actions:

Action	Description
Download all documents	See <a href="#">Download all documents action</a> .
Upload document	See <a href="#">Upload document action</a> .

To perform these tasks using APIs, see [using APIs to upload files, check file status, and download CSV files \(A- People login required\)](#)

## Download all documents action

Use the **Download all documents** to download the extracted results from an server that were created by running a with the **Upload Document** .

---

**Note:** To perform this task using an API, see [using APIs to upload files, check file status, and download CSV files \(A-People login required\)](#).

---

extracts fields from documents and exports them as CSV files. This can also download any unclassified, untrained, and invalid documents to your local directory.

Follow these steps to download extracted results from the server:

1. In the palette, double-click or drag the **Download all documents** from the **IQ Bot** .
2. In the **Learning instance name** field, select the name.
3. In the **Local output folder** field, provide a path to your local folder.
4. In the **Document status**, select the appropriate status for the documents.
  - **Success:** Documents have been processed and are in .CSV format.
  - **Invalid:** Documents were marked as invalid during the validation process.
  - **Unclassified:** Documents could not be classified.
  - **Untrained:** Documents were classified into new groups during processing and require training.
5. In the **Delete files from the server after downloading** check box, select the option to delete documents.
 

When you choose this option, even if your download fails, a compressed .zip file containing the failed documents is available for downloading again. Therefore, you must select this option.
6. Optional: In the **Save the response to a variable** field, add a variable. For example, select **prompt-assignment - string** from the drop-down list.
 

A variable value in this field provides information on whether the download was successful or failed, and the reason for the failure.
7. Click **Update**.
8. Click **Save**.
9. Click **Run now**.
10. Click **Close**.

---

**Note:** If the download fails, verify the variable value using a **Message Box** or **Log to File** . See the **Save the response to a variable** description.

---

11. Navigate to the local output folder to review the downloaded files.

## Upload document action

The **Upload Document** action enables you to upload a document with . extracts fields from the document and exports them to CSV files.

- Gain access to an .
- Ensure your local host is a registered device in the .

---

**Note:** To perform these tasks using APIs, see [using APIs to upload files, check file status, and download CSV files \(A-People login required\)](#).

---

Use the **Upload Document** action to upload a single document to the .

Follow these steps to upload a document:

1. In the palette, double-click or drag the **Upload Document** from the **IQ Bot**.

---

**Note:** A file size of 50 MB is supported for the upload action.

---

2. In the **Learning instance name** field, select the name.
3. In the **File path** field, specify the location or type of the file.
4. Optional: In the **Save the response to variable** field, add a variable. For example: select **prompt-assignment - string** from the drop-down list.  
A variable value in this field provides information about the file upload process: if the upload was successful or failed, and the reason for the failure.
5. Click **Apply**.
6. Click **Save**.
7. Click **Run now**.
8. Click **Close**.

To upload multiple files, see [Upload multiple files with IQ Bot using Loop action](#).

## Upload multiple files with IQ Bot using Loop action

You can upload multiple files by adding a **Loop** action to the **Upload Document** action in the Bot editor.

Follow these steps to upload multiple documents:

1. In the **Actions** palette, double-click or drag the **Loop** action from the **Loop** package.  
See [Loop package](#).
2. In the **Loop Type** field, select the **Iterator** option.
3. In the **Iterator** field, select **For each file in folder** from the drop-down list.
4. In the **Folder path** field, select the folder path.
5. In the **Assign file name and extension to this variable** field, specify the variable name and value.  
For example, if the variable name is **filename**, this variable is used to store file names of the chosen folder. Select the value **filename - Dictionary of Strings**.  
See [Dictionary package](#).
6. Click **Apply**.
7. In the **Actions** palette, double-click or drag the **Upload Document** action from the **IQ Bot** package.
8. Complete the information, except the **File Path** field.
9. In the **File path** field, enter a dynamic file path using a variable.
  - a) Add a file path pointing to the folder: `C:\input\`.
  - b) Add the dynamic file name string: `$(filename (name) $. $(filename (extension) $)`.

The *name* and *extension* keys are predefined. When inserted and run in a loop, the action iterates through the entire folder and calls all files in the folder one at a time. The **File path** value looks like this: `C:\input\$(filename (name) $. $(filename (extension) $)`

10. Click **Apply**.
11. Click **Save**.

To read results from variable, use the **Message box** action.

## JavaScript package

The **JavaScript** package contains actions to run a JavaScript from a bot. These actions can run JavaScript on Windows, Linux, and UNIX based devices.

## Before you start

1. Open a JavaScript file, or specify the script you want to run using the **Open** action. You must associate the details of the file or script you want to run with a session name. Use this same session name for other **JavaScript** actions.
2. Use the **Run JavaScript** action to run a function within a script or an entire script. You must use the same JavaScript session name established in the **Open** action.
3. Close the JavaScript session after running the script.

To review the bot launcher logs, navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\<current month>\Bot_Launcher-<today's date>.log.zip`. Each zipped folder contains a file with data on the code execution, which is useful for debugging.

## Actions in the JavaScript package

The **JavaScript** package includes the following actions:

**Note:** If you built a bot using actions from the JavaScript package from Build 5322 or earlier, the actions will be missing when you open the bot with the default package version. You must reinsert the actions and repopulate the fields.

Action	Description
Close	Closes the session. Specify the same session name from the <b>Open</b> action.
Open	<p>Opens a JavaScript file.</p> <ul style="list-style-type: none"> <li>• In the <b>JavaScript session</b> field, specify a session name. Use this same session name for other <b>JavaScript</b> actions.</li> <li>• Choose one of the following options:               <ul style="list-style-type: none"> <li>• In the <b>Import existing file</b> option, select an existing JavaScript file.</li> </ul> <hr/> <p><b>Note:</b> If you are uploading a script from a file on your desktop, the file and any dependencies must be in a standalone folder. When you select a file for upload, all files and folders at the same folder level are uploaded.</p> <hr/> <li>• In the <b>Manual input</b> option, enter the JavaScript.</li> </li></ul>

Action	Description
Run JavaScript	<p>Runs a function within the JavaScript.</p> <ul style="list-style-type: none"> <li>In the <b>JavaScript session</b> field, specify a session name. Use the same session name from the <b>Open</b> action.</li> <li><b>Optional:</b> Specify the function name to run and the arguments to pass to the function.</li> </ul> <hr/> <p><b>Note:</b> You can pass only a list variable as an argument for the function. You can use the list variable to pass multiple arguments of different data types such as Boolean, datetime, number, and string.</p> <hr/> <ul style="list-style-type: none"> <li><b>Optional:</b> In the <b>Assign the output to variable</b> field, specify the variable. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>

## Resources

To learn more, see [Training - Write inline scripts in a bot](#). This course introduces you to writing inline scripts within a command.

---

**Note:** You must log in with a registered A-People Community [account](#) to access course.

---

## Legacy Automation package

The actions in the Legacy Automation package are only used in migrated bots to ensure that they run seamlessly in Automation 360. We do **not** recommend using this package for new bot development.

---

**Note:** If you built a bot using actions from the Legacy Automation package from Build 5322 or earlier, the actions will be missing when you open the bot with the default package version. You must reinsert the actions and repopulate the fields.

---

## Expressions

Expressions appear in action input fields. This package has the following expressions:

Expression	Description	Use example
DictionaryToString	Converts a dictionary variable to a string variable	<pre>{{dictionaryVar.LegacyAutomation:dictionary}}</pre> <p>The output is a string variable with the following value: {key1,value1}, {key2,value2}</p>
GetBotPath	Modifies the value of the bot path variable in the 11.x or 10.x bots and replaces it with the relative bot path according to the Automation 360 repository.	

Expression	Description	Use example
GetDecrementedList	Decrements the value of the respective variable by 1. It is used mostly in the index positions of list, record or table variables.	<pre>\$myArray[\$Loop-Counter-1.LegacyAutomation:getDecrementedList][0]\$</pre> <p>The output of <code>myNumber</code> decreases by 1 with each iteration of the loop.</p>
GetIncrementedList	Increments the value of the respective variable by 1. It is used mostly in the index positions of list, record or table variables.	<pre>\$Loop-Counter-1.LegacyAutomation:getIncrementedList</pre> <p>The output of <code>myNumber</code> increases by 1 with each iteration of the loop.</p>
GetKeystrokeCount	Calculates the values of keystrokes in a phrase/text  <b>Note:</b> A special character, such as [TAB], [END], or [PAGE DOWN], is counted as one keystroke.	<pre>\$KeyStroke-CharLength.LegacyAutomation:getKeystrokeCount</pre> <p>The output is the average delay for each keystroke.</p>
GetLegacyIndexValue	Retrieves the value from the specific index position of the list variable in the bots migrated from 11.x or 10.x. If the index position is greater than the size of the list variable, the system retrieves the value from the first index position of the list in the migrated bots	
ListToString	Converts a list variable to a string variable.	<pre>{{ \$listVar.LegacyAutomation:listToString \$ }}</pre> <p>The output is a string variable with the following value: value1,value2,value3</p>
ListToTable	Converts a list variable to a table variable.	<pre>{{ \$my-list-variable.LegacyAutomation:listToTable \$ }}</pre> <p>The output is a table variable where each list value is cell in a single column.</p>
ParseLegacyKeys	Ensures that the <b>Insert Key Stroke</b> command of the 10.x/11.x bots stored in variables is successful upon execution. This expression converts them into equivalent Automation 360 key strokes during the execution.  <b>Note:</b> The appearance of some special characters differs between Version 11.3 and Automation 360. For example, the Page Up key appears as [PAGE UP] in Version 11.3 and [PAGE-UP] in Automation 360. This difference does not impact bot function.	<pre>\$Test.LegacyAutomation:parseLegacyKeys \$</pre>

Expression	Description	Use example
ParseVariableOperation	Parses the expression provided in the 10.x/11.x <b>Variable Operation</b> command. This expression ensures that Automation 360 returns the same output as 10.x/11.x bots upon execution.	<code>\$prompt-assignment.LegacyAutomation:parseVariableOperation</code>
TableToString	Converts a table variable to a string variable.  You can also use delimiters such as a colon, semicolon, or space to separate the values of the string variable in the output.	<pre> {{{ \$tableVar.LegacyAutomation:tableToString }}} </pre> <p>The output is a string variable with the following value: {value1,value2},{value3,value4}</p> <p>Use a colon, semicolon, or space as &lt;"delimiter"&gt;:</p> <pre> {{{ \$tableVar.LegacyAutomation:tableToString "delimiter" }}} </pre> <p>For example:</p> <pre> {{{ \$tableVar.LegacyAutomation:tableToString "delimiter" }}} </pre> <p>The output is a string variable with the following value: {value1:value2}:value3:value4</p>
TableToList	Converts a table variable to a list variable.	<pre> {{{ \$dataTable.LegacyAutomation:tableToList }}} </pre> <p>For example:</p> <pre> {{{ \$dataTable.LegacyAutomation:tableToList }}} </pre> <p>The output is a list variable with the following value: [value1,value2,value3]</p>

## List package

The **List** package contains actions that enable you to perform various operations on a variable of the list data type.

### Working with variables of list data type

A list is a collection of ordered values. The values can be of Boolean, number, or string data subtype. When initializing a list variable, you can select the **Any** data subtype in order to hold any of the three data subtypes. You can manually enter values by creating a new variable or selecting an existing one from the **Variables** menu, and then clicking **Add**.

Common uses of list variables include:

- Sending an email to multiple recipients.
- Searching multiple web addresses.

## Actions in the List package

If you are using a **List** action in a **Loop** action, you must use the **For each item in the list** iterator.

The following actions are available in the **List** package:

Action	Description
<b>Add item</b>	<p>Inserts an item into a list variable. You can choose to add the item at the end of the list or specify a position in the list.</p> <ul style="list-style-type: none"> <li>• Select the list variable in which to add an item from the <b>List variable</b> list.</li> <li>• Select the variable that contains the value to add from the <b>Item to be added</b> list.</li> </ul> <hr/> <p><b>Note:</b> The variable must be of the same sub-data type as the other list items.</p> <hr/> <ul style="list-style-type: none"> <li>• Select the <b>To end of list</b> option to insert the item at the end of the list or select <b>At list index</b> to specify the index in the list where to insert the item.</li> </ul> <p>The list index starts from 0. The first item in the list is at position 0, the second item at 1, and so on. For example, to add an item at the fourth position in a list, enter 3 in the <b>At list index</b> field.</p>
<b>Assign</b>	<p>Assigns the value of the source list to the destination list variable.</p> <ul style="list-style-type: none"> <li>• Select the source list variable from the drop-down list or create a new list variable.</li> <li>• Select a list variable or create one to hold the output.</li> </ul>
<b>Clear</b>	<p>Clears all items from the selected list variable.</p>
<b>Get item</b>	<p>Retrieves a value at the specified position in a list and stores the output to a variable.</p> <ul style="list-style-type: none"> <li>• Select the list variable from which you want to retrieve a value from the <b>List variable</b> list.</li> <li>• Specify the position in the list from where you want to retrieve the value in the <b>Index number</b> field. The list index starts from 0. The first item in the list is at position 0, the second item at 1, and so on.</li> <li>• Select a variable that you want to use to store the output from the <b>Assign the output to variable</b> list.</li> </ul>
<b>Join items</b>	<p>Combines all the available values in a list variable and stores the output to a string variable. You can specify the delimiter you want to use as a separator in the output.</p> <ul style="list-style-type: none"> <li>• Select the list variable that you want to use from the <b>List variable</b> list.</li> <li>• Specify the delimiter you want to use to separate values in the output in the <b>Delimiter</b> field.</li> <li>• Select a variable that you want to use to store the output from the <b>Assign the output to variable</b> list.</li> </ul>

Action	Description
<b>Remove item</b>	<p>Removes an item from a list and assigns the output to a variable.</p> <ul style="list-style-type: none"> <li>• Select the list variable from which you want to remove an item from the <b>List variable</b> list.</li> <li>• Specify the position in the list from where you want to remove the value in the <b>Index number</b> field. The list index starts from 0. The first item in the list is at position 0, the second item at 1, and so on.</li> <li>• Select a variable that you want to use to store the output from the <b>Assign the output to variable</b> list.</li> </ul>
<b>Set item</b>	<p>Sets an item at the specific position in a list and stores the output in a variable.</p> <ul style="list-style-type: none"> <li>• Select the list variable in which you want to set a value from the <b>List variable</b> list.</li> <li>• Specify the position in the list where you want to set the item in the <b>Index number</b> field. The list index starts from 0. The first item in the list is at position 0, the second item at 1, and so on.</li> <li>• Select a variable that you want to use to store the output from the <b>Assign the output to variable</b> list.</li> </ul>
<b>Size</b>	<p>Retrieves the number of items in a list and assigns the output to a number variable.</p> <ul style="list-style-type: none"> <li>• Select the list variable for which you want to retrieve the size from the <b>List variable</b> list.</li> <li>• Select a number variable that you want to use to store the output from the <b>Assigns the number of items to variable</b> list.</li> </ul>

### Related reference

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

#### [Variables overview](#)

Automation 360 offers a variety of variables, each designed to hold specific types of data and is intended for specific use. Use the topics below to learn more about each variable and how to use them.

## Log To File package

Use the **Log To File** package to create a log file with data.

The **Log To File** package enables the following:

- Verify that a bot ran properly.
- Create a new log file.
- Specify custom text to be included in the log file.
- Add a time stamp to the log file.
- Use a log file as a variable.

---

**Note:** The package supports ANSI, Unicode, and UTF8. It can save files as .csv and .txt.

---

## Actions in the Log To File package

The **Log To File** package includes the following action:

Action	Description
Log to file	See <a href="#">Using Log To File action</a> .

## Using Log To File action

Using the Log To File action, you can create a log file with data about the events that occur when a TaskBot runs.

Follow these steps to log text into a file:

1. In the **Actions** palette, double-click or drag the **Log To File** action from the **Log To File** package.
2. In the **File path** field, specify the file location or variable.
3. In the **Enter text to log** field, enter the text to log in the file.
4. Select the **Append timestamp** check box to add a time stamp.
5. In the **When logging** field, choose **Append to existing file** to append the log file or **Overwrite existing log file** to overwrite the content in the log file.
6. Select the **Encoding** type.
  - **ANSI**: Used to encode Latin alphabet.
  - **UNICODE**
  - **UTF8**: Can encode all possible characters.
  - **UTF-16LE**: Inserts a byte order mark (BOM) Unicode character at the beginning of the file.

---

**Note:** Shift-JIS files must use **ANSI** as encoding to read text file content.

---

If you selected the **Append to existing file** option in Step 5, ensure that the selected encoding type matches that of the original file, otherwise some of the characters might not be logged.

7. Click **Save**.

## Loop package

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

The Loop package enables you to repeatedly run specific actions within a bot. For example, repeat the set of actions that read data from each row of a Microsoft Excel file, rename all files in a folder, and save each email in a mailbox. You can also use the **If** action within the Loop action to validate a condition, and based on the outcome of it, skip the current iteration in the loop or even break the loop.

For conditional loops, different actions are taken depending on whether the conditional parameters are met. For loops that have a specified number of iterations, the loop exits on the last iteration and goes to the next step in the bot.

## Actions in the Loop package

The following Loop actions are available:

Action	Description
Loop	Repeats the action for a specific number of times based on the option selected from the <b>Iterator</b> list, or until the condition is met based on the option selected from the <b>Condition</b> list. See <a href="#">Using Loop action</a> .
Continue	Use the <b>Continue</b> action along with the <b>If</b> action to skip the current iteration and continue with the next iteration in the loop based on the condition you have specified in the <b>If</b> action. See <a href="#">If package</a> .
Break	You can use the <b>Break</b> action along with the <b>If</b> action to terminate the loop based on the condition you have specified in the <b>If</b> action. When you terminate the loop, the actions immediately following the <b>Loop</b> action run. See <a href="#">If package</a> .

### Iterator-related conditions within the Loop action

Select the **Iterator** option to specify the number of times the set of actions will be repeated as part of the Loop action:

Iterator	Description
For each row in CSV/TXT	Repeats the set of actions for each row in the specified CSV or text file and assigns the values in the current row to a record variable. See <a href="#">Using the For each row in CSV/TXT iterator</a> .
For each row in Data Table	Repeats the set of actions for each row in the specified table and assigns the values in the current row to a record variable. See <a href="#">Using the For each row in table iterator</a> .
For each row in a SQL query dataset	Repeats the set of actions for each row in the specified SQL query dataset and assigns the values in the current row to a record variable. Provide the session name that you have used to establish a connection with the database.
For each key in the Dictionary	Repeats the set of actions for each key in the specified Dictionary variable and assigns the name of the current key to a variable.  <b>Note:</b> When a bot runs a <b>Loop</b> action that contains a <b>Dictionary</b> > <b>Put</b> action, the bot only iterates on the original number of items in a dictionary; it ignores items inserted using the <b>Put</b> action.
For each value in the Dictionary	Repeats the set of actions for each value in the specified Dictionary variable and assigns the current value to a variable. Because this variable type can hold various subtypes (String, Number, Boolean, and so on), if you quick-create a variable when configuring the action, the variable is of Any type.  <b>Note:</b> When a bot runs a <b>Loop</b> action that contains a <b>Dictionary</b> > <b>Put</b> action, the bot only iterates on the original number of items in a dictionary; it ignores items inserted using the <b>Put</b> action.
For each mail in mailbox	Repeats the set of actions for each email in the specified mailbox. See <a href="#">Using the For each mail in mail box iterator</a> .

Iterator	Description
For each row in worksheet (Excel basic or Excel advanced)	<p>Repeats the set of actions for each row that contains data in a worksheet and assigns the values in the current row to a record variable. Provide the session name that you have used to open the Excel basic or Excel advanced worksheet. Specify whether to repeat the actions for all the rows, specified rows, or a specified cell range. Select a record variable from the <b>Assign the current row to this variable</b> list or create a new one. See <a href="#">Record variable</a>.</p> <p>This iterator retrieves cell values as string data types. It supports Excel cell formats, including Number, Percentage, Currency, Scientific, and Date. For example, a value from a cell of Currency formatting retains the currency symbol when passed to a table or record variable.</p> <ul style="list-style-type: none"> <li>You must convert the values to perform non-string operations.</li> <li>In Excel advanced, when you choose loop iterator as <b>For each row in worksheet</b>, you have a <b>Read</b> option to read either the visible text or value of the cell.</li> </ul> <p>For example, if the cell has 70% as cell content, <b>Read cell value</b> option will read the value as 70 ignoring the % format whereas <b>Read visible text</b> option will read the content as 70%.</p> <hr/> <p><b>Recommendation:</b> Use the <b>Read cell value</b> option as reading value from a cell for better performance than reading visible text.</p> <hr/>
For each file in folder	Repeats the set of actions for each file in the specified folder and assigns the properties of the current file to a Dictionary variable containing two keys: the <code>name</code> key holds the file name and the <code>extension</code> key holds the file extension.
For each folder in folder	Repeats the set of actions for each folder in the specified folder and assigns the current folder name to a String variable.
For each item in the list	<p>Repeats the set of actions for each item in the specified list and assigns the current item to a variable. Specify whether to repeat the action for all items in the list or only for the range of items in the list. Because this variable type can hold various subtypes (String, Number, Boolean, and so on), if you quick-create a variable when configuring the action, the variable is of Any type.</p> <hr/> <p><b>Note:</b> The index in a list starts from zero. For example, to repeat the action for items from the third position to the sixth position of the list, specify 2 and 5 in the appropriate fields.</p> <hr/>
For n times	Repeats the actions in the container the specified number of times. You can assign the iteration count to a Number variable.
For each value in record	Repeats the actions for each value in the specified record and assigns the current value to a variable. Because this variable type can hold various subtypes (String, Number, Boolean, and so on), if you quick-create a variable when configuring the action, the variable is of Any type..
For each meeting in calendar	Use this option to repeat the set of actions for each meeting in the specified calendar. See <a href="#">Using Office 365 Calendar actions in a loop</a> .

Iterator	Description
For each row in worksheet (Office 365 Excel)	Repeats the set of actions for each row that contains data in a worksheet. <ul style="list-style-type: none"> <li>• Provide the session name that you have used to open the worksheet.</li> <li>• Specify whether to repeat the actions for all the rows or specific rows.</li> <li>• You can assign the values in the current row to a record variable.</li> </ul>
For each node in a XML dataset	Repeats the set of actions for each node in an XML dataset and assigns the current node to String variable. Provide the session name that you have used to open the XML file.

## While related conditions in the Loop action

You can configure multiple while related conditions within a single Loop action:

1. Click **Add condition**.
2. Select either of the following options:
  - **And**: Both of the conditions must be met for the actions to run.
  - **Or**: Either of the conditions must be met for the actions to run.
3. Select the conditions from the drop-down list.

Select the **While** option to use the following conditions:

While	Description
Application	Use the <b>Application is not running</b> or <b>Application is running</b> condition to execute actions based on whether an application is running or not running.  Enter the application path or specify the path using a variable along with the amount of time to wait (in seconds) for the condition to be true.
Boolean	Use this condition to execute actions based on the value of a Boolean variable. Use this condition to compare the values of two Boolean variables or one Boolean variable to a selected Boolean value.
Data table	Use the <b>Data table is empty</b> condition to execute actions based on whether the specified table contains values.  Use the <b>Number of rows</b> and <b>Number of columns</b> conditions to execute actions based on whether the number of columns or rows is <b>Equal to</b> , <b>Greater than</b> , or <b>Less than</b> the specified value.
Datetime	Use the <b>Datetime variable</b> condition to execute actions based on whether the value of the source datetime variable is <b>Equal to</b> or <b>Not Equal to</b> , is <b>Greater than</b> or <b>Equal to</b> , or is <b>Lesser than</b> or <b>Equal to</b> the value of the target datetime variable.
Dictionary	Use this condition to repeat the set of actions based on whether the selected dictionary variable contains the specified key.  <b>Note:</b> The key comparison is case-sensitive.

While	Description
File	<p>Use the following conditions to execute the action:</p> <ul style="list-style-type: none"> <li>• <b>File date</b> Use this condition to verify the date and time that the specified file was created or modified. Specify a date range using the <b>Is within last</b>, <b>Is between</b>, or <b>Is before</b> options. For the <b>Is within last</b> option, specify the number of days or time (in hours, minutes, and seconds). Enter the amount of time (in seconds) to wait for this condition to be true.</li> <li>• <b>File exists</b> and <b>File does not exist</b> Use these conditions to execute an action based on whether a file exists. For example, if a data file exists, format the file and upload it to a database.</li> <li>• <b>File size</b> This condition verifies if the specified file is larger, smaller, not the same, or the same as the size you specify.  Enter the amount of time (in seconds) to wait for this condition to be true.</li> </ul>
Folder does or does not exist	Use these conditions to repeat the set of actions based on whether a folder exists.
Image Recognition	<p>Use these conditions to verify whether:</p> <ul style="list-style-type: none"> <li>• <b>Image file</b> is found in the <b>Image file</b> or not.</li> <li>• <b>Image file</b> is found in the <b>Window</b> or not.</li> <li>• <b>Window</b> is found in the <b>Image file</b> or not.</li> <li>• <b>Window</b> is found in the <b>Window</b> or not.</li> </ul> <p>For the <b>Window</b> conditions, you can use the <b>Resize window</b> option to specify the window dimensions. This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p> <hr/> <p><b>Note:</b> This option is only available for windows that can be resized. It is not available for Desktop or Taskbar options.</p> <hr/>
JavaScript	Use the <b>Script is successful</b> or <b>Script is unsuccessful</b> condition to execute actions based the status of the specified JavaScript. Select the file that contains the script and optionally specify the parameters by selecting a list variable.

While	Description
Legacy automation	<p>The <b>Legacy automation</b> conditions are only used in migrated bots to ensure that they run seamlessly in Automation 360. We do <b>not</b> recommend using these conditions for new bot development. The following conditions to verify the following:</p> <ul style="list-style-type: none"> <li>• Whether <b>Web control</b> exists or not.</li> <li>• Whether <b>Window control</b> exists or not.</li> <li>• Whether <b>Window control</b> is active or not.</li> <li>• Whether <b>Script</b> is successful or not.</li> <li>• Whether <b>Child window</b> exists or not.</li> </ul> <p>For the <b>Window control</b> conditions, you can use the <b>Resize window</b> option to specify the window dimensions. This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.</p>
List	Use the <b>List variable</b> condition to execute actions based on whether the specified list variable contains a particular value. The value can be of <b>Number</b> , <b>String</b> , or <b>Boolean</b> data type.
Number	Use the <b>Number variable</b> condition to execute actions based on whether the specified number variable is <b>Equal to</b> or <b>Not Equal to</b> , or is <b>Greater than</b> or <b>Equal to</b> , or is <b>Lesser than</b> or <b>Equal to</b> a particular value.
Ping	Use the <b>Ping is successful</b> or <b>Ping is unsuccessful</b> condition to verify if a machine or server is running, and execute actions based on the result. Enter the amount of time (in seconds) to wait for the condition to be true.
Recorder	Use this condition to detect an <b>Object</b> in a window. Select a window or variable to capture the object. Enter the amount of time (in seconds) to wait for this condition to be true.
Service	Use the <b>Service is running</b> or <b>Service is not running</b> condition to execute actions based on whether a service is running or not. Select <b>Service list</b> to choose a service from the list of available services.
String	<p>Use the <b>String variable</b> condition to execute actions based on whether the specified source string value is <b>Equal to</b> or <b>Not equal to</b>, or <b>Includes</b> or <b>Does not include</b> the target value.</p> <p>You can select the <b>Match case</b> option to only execute actions if the two strings have matching uppercase and lowercase letters.</p> <p>When you extract text from a Microsoft application, the extracted text contains the <code>/r/n</code> special characters which indicate a new line. Select the <b>Ignore Carriage return</b> option if you want to ignore the <code>/r</code> special character when you compare the text.</p> <p>To create a condition based on whether a string is empty or not empty, compare the source value to an empty target field using the <b>Equal to</b> operator.</p> <p>See <a href="#">Example of using a conditional statement</a>.</p>
Task Bot	Use the <b>Task successful</b> or <b>Task unsuccessful</b> condition to execute actions based on the status of the specified Task Bot.

While	Description
VBScript	Use the <b>Script is successful</b> or <b>Script is unsuccessful</b> condition to execute actions based on the status of the specified Visual Basic script. Select the file that contains the script and optionally specify the parameters by selecting a variable.
Window	Use the <b>Window exists</b> or <b>Window does not exist</b> condition to verify if a specific application window is open by entering the <b>Window title</b> or using a variable. Enter the amount of time (in seconds) to wait for the condition to be true.  Use the <b>Window with same title does not exist</b> or <b>Window with same title exist</b> condition to verify whether a window with the same title exists or whether the window title has changed. Enter the amount of time (in seconds) to keep verifying if the condition is true.

### Related tasks

#### [Example of transferring data from CSV file to Excel worksheet](#)

In this example, you build a bot to update the product inventory in an Excel worksheet with new product names from a CSV file. Use actions from the CSV/TXT, Excel advanced, IF/ELSE, and Loop packages.

#### [Example of entering data into a web form from a worksheet](#)

In this example, you build a bot to enter multiple rows of data from an XLSX sheet into a web form. Use actions from the Excel advanced, Loop, and Recorder packages.

### Related reference

#### [Record variable](#)

A record variable holds a row of data extracted from a database, spreadsheet, or table in name-field pairs. The fields can store values of Boolean, datetime, number, or string data type.

## Using Loop action

Use the Loop action to repeatedly run a sequence of actions for a specific number of times or until a condition is met.

To repeatedly run a sequence of actions, do the following:

1. Double-click or drag the **Loop** action from the **Actions** palette.
2. Set the desired conditions for the loop.

Option	Action
<b>Select the Iterator option to repeat the sequence of actions for a specific number of times.</b>	Select an option from the <b>Iterator</b> list to specify how many times the sequence of actions is to be repeated.  See <a href="#">Loop package</a> for the list of available options.
<b>Select the While option to repeat the sequence of actions until a condition is met.</b>	<ol style="list-style-type: none"> <li>a. Select an option from the <b>Condition</b> list to specify the condition.</li> <li>b. Select the <b>Check the condition at the end of the iteration</b> to validate the condition at the end of each iteration. This option enables you to ensure that the set of actions run at least one time, even if the condition is not met.</li> </ol>

3. Double-click or drag the actions to be repeated within the **Loop**.

4. Optional: Double-click or drag the **Continue** action from the **Loop** package to skip the current iteration and continue with the next iteration of the loop.
5. Click **Save**.

Watch the following video on how to use the Loop action:

## Using the For each row in CSV/TXT iterator

Use the **For each row in CSV/TXT** iterator in the Loop action to read the data of each row in a CSV or text file and assign the current row to a record variable. The bot reads the values in each cell as string-type values, even if there are numerical values.

First, open the CSV or text file. [Using the Open action for CSV/TXT file](#)

---

**Note:** The **For each row in CSV/TXT** iterator only supports CSV/TXT files that conform to the RFC 4180 standard. For more information about the standard, see [Common format and MIME type for CSV files](#).

---

To use the **For each row in CSV/TXT** iterator in a **Loop** action, do the following:

1. Double-click or drag the **Loop** action from the **Loop** package in the **Actions** palette.
2. Select the **For each row in CSV/TXT** option from the **Iterator** list.
3. Enter the name of the session that you have used to open the CSV or text file in the **Open** action.
4. Select a record variable from the **Assign the current row to this variable** list or create a new one.

---

**Note:** If you select an existing record variable, ensure that the column headers capitalization in the CSV or text file match that of the schema of the record variable. [Schema](#)

---

Insert actions to use the values from the CSV or text file in your automation. Use the record variable to retrieve the values by index number or column name. For example, if the first column of the file is titled `EmployeeID`, to retrieve the value of the first cell of each row enter `$rYourVariableName[0]$` or `$rYourVariableName{EmployeeID}$`.

---

**Note:** You must select the **Contains header** option in the **CSV/TXT > Open** action to specify the record values by column name.

---

For an example, see [Build a Bot Insight dashboard bot](#).

## Using the For each row in table iterator

Use the **For each row in table** iterator in the Loop action to read the data of each row in a table variable and assign the current row to a record variable.

First, retrieve the table values and store them to a table variable.

---

**Example:** [Example of extracting data from a web table](#)

---

To use the **For each row in table** iterator in a **Loop** action, do the following:

1. Double-click or drag the **Loop** action from the **Loop** package in the **Actions** palette.
2. Select the **For each row in table** option from the **Iterator** list.
3. Select the variable that holds the values from the **Table variable** list.
4. Select a record variable from the **Assign the current row to this variable** list or create a new one.
5. Click **Save**.

Insert actions to use the values from the data table in your automation. Use the record variable to retrieve the values by index number or column name. For example, if the first column of the file is titled `EmployeeID`, to retrieve the value of the first cell of each row enter `$rYourVariableName[0]$` or `$rYourVariableName{EmployeeID}$`.

## Message box package

Use the **Message box** action from the **Message box** package to insert a message box that shows a message when the task runs. For example, you can insert a **Message Box** action to follow a web form so that the action displays the message: `Web Form Filled and Complete`.

For more information, see [Using the Message box action](#).

Use the following examples to learn how to use the **Message box** action when building automations.

- [Build a Go be Great bot](#)  
Build a basic TaskBot using a Message Box action and a variable.
- [Build a basic bot that uses a desktop application](#)  
An example of how to build a basic TaskBot that uses the calculator application.

## Using the Message box action

Use the **Message box** action to insert a message box that shows a message when the task runs.

1. Double-click or drag the **Message box** action from the **Message box** package in the Actions palette.
2. Enter a window title for the message box.
3. Enter the message to display.  
This field holds up to 65535 alphanumeric, character, and empty values.

---

**Note:** To provide a string that includes a dollar sign (\$), you must enter two dollar signs. For example, if you enter `Pay $$5.00`, the output will be `Pay $5.00`.

---

4. Specify the number of lines at which to show a scroll bar.
5. Optional: Select the **Close message box after** option and specify the number of seconds after which the message box closes automatically.

---

**Important:** Select this check box if the bot will run on an unattended machine.

---

6. Click **Save**.

## Microsoft LUIS NLP package

The **Microsoft LUIS NLP** package contains actions that enable you to connect to and consume the Microsoft Cognitive Services Text Analytics API to identify the language, sentiment, key phrases, and entities. This package supports the following languages: English, Chinese (Simplified), French, German, and Spanish.

### Before you start

You must have an Azure Cognitive Services resource to use these actions. See [Create a Cognitive Services resource using the Azure portal](#).

You also require the following in order to use the actions:

- **Service Endpoint URL:** the endpoint URL that identifies the Azure service.

- **Subscription Key:** the unique key that authenticates Automation Anywhere Enterprise.

## Actions in the Microsoft LUIS NLP package

Action	Description
<b>Detect language</b>	Identifies the language of the provided content and returns it in ISO 639-1 language code. The output is stored in a string variable.
<b>Get key phrases</b>	Identifies the main points and returns a list of key phrases. For example, if the input text is about a basketball game, this action returns the names of teams, the name of the venue, and the final score.
<b>Get named entities</b>	Identifies the entities in the provided content such as people, places, organizations, date/time, quantities, branded products, and book titles. The output is stored in a dictionary variable, where each name is a key, and the corresponding entity is the value.
<b>Get sentiment</b>	Analyzes the provided content and returns a sentiment and score. <ul style="list-style-type: none"> <li>• If the score is greater than 0.6, the sentiment is Positive.</li> <li>• If the score is in the 0.2 through 0.6 range, the sentiment is Neutral.</li> <li>• If the score is less than 0.2, the sentiment is Negative.</li> </ul> The output is stored in a dictionary variable containing two keys and their corresponding values: <code>sentiment</code> and <code>score</code> .

## Mouse package

Use the **Mouse** package to simulate mouse actions.

### Actions in the Mouse package

The **Mouse** package includes the following actions:

Action	Description
Click	See <a href="#">Using the Click action</a> .
Move	See <a href="#">Using the Move action</a> .
Scroll	See <a href="#">Using the Scroll action</a> .

## Secure Recording

When secure recording mode is enabled, bots do not capture object images or values. This ensures that sensitive data is not stored in the bots.

When you record a task in secure recording mode, the **Preview** window temporarily shows the captured area. This image is deleted after you navigate away from the action editor window.

A user with admin privileges must enable this setting. See [Settings](#).

## Using the Click action

Use the **Click** action to enable a bot to simulate mouse clicks. This action enables to capture the UI element such as the screen or window, and to specify the click event and click button.

Ensure that the screen scale and resolution of the Bot Creator device is the same as the Bot Runner device. If the screen scale and resolution are different, the bot might fail when deployed to the Bot Runner device.

If you are using Internet Explorer, the bot waits until the browser is completely rendered and is in a ready state before executing the **Click** action.

Follow these steps to add a **Click** action:

1. In the **Actions** palette, double-click or drag the **Click** action from the **Mouse** package.

2. Specify the window in which to capture the mouse click:

Choose from the **Application**, **Browser**, or **Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows.  <b>Note:</b> You can use the <b>Screen</b> option to capture coordinates on the device screen, however we recommend specifying a window because screen sizes can change, which distorts the captured coordinates.
<b>Browser</b>	Select from a list of Google Chrome tabs.
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.  <b>Note:</b> This option deactivates the <b>Capture</b> option. Use this option only after you have completed the capture step.

Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value. For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad)` for all the window title names starting with `((\w*)-Notepad)`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

3. Optional: Select the **Resize window** option to specify the window dimensions.  
This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.
  - If the window is maximized when you record the task, this option is unselected.
  - If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

4. Click **Capture coordinate**.  
The selected window appears.
5. Drag the mouse to select the click spot and left-click to capture it.  
The captured spot appears in the **Preview** section with the coordinates underneath.
6. In the **Button** option, specify the button to click.  
Choose from **Left Button**, **Right Button**, or **Middle Button**.
7. In the **Event** option, specify the event.  
Choose from **Click**, **Double click**, **Button up**, or **Button down**.
8. Click **Save**.

## Using the Move action

Use the **Move** action to simulate moving the mouse pointer from one location to another.

Follow these steps to add a **Move** action:

1. In the **Actions** palette, double-click or drag the **Move** action from the **Mouse** package.
2. In the **Mouse from** and **Mouse to** fields, specify the **X** and **Y** coordinates.
3. Click **Capture coordinate** to capture the starting point location.
4. Click **Capture coordinate** to capture the end point location.
5. **Optional:** In the **Delay in milliseconds** field, specify the total duration of the movement in milliseconds.
6. Click **Save**.

## Using the Scroll action

Use the **Scroll** action to simulate scrolling the mouse wheel up or down.

Follow these steps to add a **Scroll** action:

1. In the **Actions** palette, double-click or drag the **Scroll** action from the **Mouse** package.
2. In the **Select scroll option**, select the **Up** or **Down** option.
3. In the **Number of iterations** field, specify the number of times to scroll.
4. **Optional:** In the **Delay in milliseconds** field, specify the total duration of the scrolling in milliseconds.
5. Click **Save**.

## Number package

The Number package contains actions that enable you to perform various operations on a number variable. A number variable holds numeric values, including integers and decimals. It holds values from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807, and up to 15 decimal digits.

### Actions in the Number package

The actions in the Number package accept a variable as an input and assign the output to a variable. These actions enable you to assign a value to a Number variable, decrement or increment a number, or convert a Number variable to a String variable.

You can use large variable numbers to perform mathematical operations. The length of the number supported is 65534. In the bot editor, use the actions menu (vertical ellipsis at the top-right) to select the **Advanced settings > Enable improved number support**.

The Number package includes the following actions:

Action	Description
Assign	<p>Assigns a specified number or result of an expression to a user-defined Number variable. You can use expressions built using the +, -, *, and / operators and use parentheses to group expressions. For example, (3*4)+5 or (\$Variable2*\$Variable3)/\$Variable1.</p> <ul style="list-style-type: none"> <li>• Enter a number or select a predefined Number variable.</li> <li>• Select a predefined number variable or create a new one to hold the output.</li> </ul>
Decrement	<p>Decrements (decreases by set intervals) a number by a user-specified value.</p> <ul style="list-style-type: none"> <li>• Enter a number or select a predefined Number variable.</li> <li>• Enter the decrement value or select a predefined Number variable.</li> <li>• Select a predefined number variable or create a new one to hold the output.</li> </ul>
Increment	<p>Increments (increases by set intervals) a number by a user-specified value.</p> <ul style="list-style-type: none"> <li>• Enter a number or select a predefined Number variable.</li> <li>• Enter the increment value, the value must be greater than zero or select a predefined Number variable.</li> <li>• Select a predefined number variable or create a new one to hold the output.</li> </ul>

Action	Description
Random	<p>Generates a random integer from a user-specified range and assigns it to a number variable.</p> <ul style="list-style-type: none"> <li>In the <b>Beginning of range</b> field, enter a number or select a predefined number variable.</li> </ul> <hr/> <p><b>Note:</b> This field accepts values in the range of -9,223,372,036,854,775,808 through 9,223,372,036,854,775,807, and up to 15 decimal digits.</p> <hr/> <ul style="list-style-type: none"> <li>In the <b>End of range</b> field, enter a number or select a predefined number variable that is greater than the value in the <b>Beginning of range</b> field.</li> </ul> <hr/> <p><b>Note:</b> This field accepts values in the range of -9,223,372,036,854,775,808 through 9,223,372,036,854,775,807, and up to 15 decimal digits.</p> <hr/> <ul style="list-style-type: none"> <li>Select a predefined number variable or create a new one to hold the output.</li> </ul>
To string	<p>Converts a user-specified number to a string.</p> <ul style="list-style-type: none"> <li>Enter a number or select a predefined Number variable.</li> <li>Enter the amount of digits after the decimal.</li> </ul> <p>To remove all the digits after the decimal, leave the default value of 0.</p> <ul style="list-style-type: none"> <li>Assign the output to a String variable. You can use <i>prompt-assignment</i> during building and testing of the bot.</li> </ul> <hr/> <p><b>Important:</b> Ensure that you reassign the values from <i>prompt-assignment</i> to a user-created variable before deploying the bot into production.</p> <hr/>

## OCR package

The **OCR** package contains actions that enable you to extract text from images or applications.

The **OCR** package enables you to:

- Extract text from a window or a specific area of an application.
- Extract text from images or files stored on a local machine, a website, or the Control Room folder.

- Filter extracted text and store it as a variable.

---

**Note:** You can extract text from images in .jpeg, .jpg, .bmp, .gif, and .png formats.

---

ABBYY FineReader 12.2.27.12 is installed along with A2019 and does not require any additional setup.

## Actions in the OCR package

The **OCR** package includes the following actions:

Action	Description
Capture image by path	See <a href="#">Using Capture image by path action.</a>
Capture image by url	See <a href="#">Using Capture image by URL action.</a>
Capture window	See <a href="#">Using Capture window action.</a>
Capture area	See <a href="#">Using Capture area action.</a>

## Secure Recording

When secure recording mode is enabled, bots do not capture object images or values. This ensures that sensitive data is not stored in the bots.

When you record a task in secure recording mode, the **Preview** window temporarily shows the captured area. This image is deleted after you navigate away from the action editor window.

A user with admin privileges must enable this setting. See [Settings](#).

## Using Capture image by path action

Use the **Capture image by path** action to extract text from an image on a device or a folder in the Control Room. The extracted text can assigned as a variable.

Follow these steps to use the **Capture image by path** action:

1. In the **Actions** palette, double-click or drag the **Capture image by path** action from the **OCR** package.
2. In the **Image path** field, select an option:
  - **Control Room file:** Uses a file that is available on the Control Room.
  - **Desktop file:** Uses a file that is available on a device.
  - **Variable:** Uses a file variable to specify the file location.
3. Select the **Filter the captured text** check box to filter the captured text. Specify the text to filter out in the **Before** and **After** fields. For example, if the extracted text is Name: ABC Inc. Location:, to retrieve ABC Inc., you must specify Location: in the **Before** field and Name: in the **After** field.
4. Select the **Trim the captured text** check box to trim the extra spaces.
5. Select the **Load Profile** check box and select an option to load the locale based on the ABBYY profile:

---

**Note:** ABBYY FineReader 12.2.27.12 is installed along with A2019 and does not require any additional setup.

---

- **Control Room file:** Uses a file that is available on the Control Room.

- **Desktop file:** Uses a file that is available on a device.
- **Variable:** Uses a file variable to specify the file location.

6. In the **Select locale** list, select the language of the device.

---

**Note:** Currently, only English and Japanese locales are supported. If you have selected an option from the **Select locale** list and the **Load Profile** option, the system considers the locale based on the **Load Profile** selection.

---

7. In the **Assign value to variable** list, select a string variable.

8. Click **Save**.

## Using Capture image by URL action

Use the **Capture image by url** action to extract text from an online image. You can filter the extracted text and assign it to a string variable.

Follow these steps to use the **Capture image by url** action:

1. In the **Actions** palette, double-click or drag the **Capture image by url** action from the **OCR** package.
2. In the **Image url** field, specify the URL.

---

**Note:** A URL of an image on a shared drive or an FTP server is not supported.

---

3. Select the **Filter the captured text** check box to filter the captured text.  
Specify the text to filter out in the **Before** and **After** fields. For example, if the extracted text is `Name: ABC Inc. Location:`, to retrieve `ABC Inc.`, you must specify `Location:` in the **Before** field and `Name:` in the **After** field.
4. Select the **Trim the captured text** check box to trim the extra spaces.
5. Select the **Load Profile** check box and select an option to load the locale based on the ABBYY profile:

---

**Note:** ABBYY FineReader 12.2.27.12 is installed along with A2019 and does not require any additional setup.

---

- **Control Room file:** Uses a file that is available on the Control Room.
- **Desktop file:** Uses a file that is available on a device.
- **Variable:** Uses a file variable to specify the file location.

6. In the **Select locale** list, select the language of the device.

---

**Note:** Currently, only English and Japanese locales are supported. If you have selected an option from the **Select locale** list and the **Load Profile** option, the system considers the locale based on the **Load Profile** selection.

---

7. In the **Assign value to variable** list, select a string variable.

8. Click **Save**.

## Using Capture window action

Use the **Capture window** action to extract text from an application window. You can filter the extracted text and assign it to a string variable.

Follow these steps to use the **Capture window** action:

1. In the **Actions** palette, double-click or drag the **Capture window** action from the **OCR** package.
2. In the **Window title** field, select an option:

- **Window:** Captures a window on a desktop. In the **Window title** field, specify the application title.
- **Variable:** Inserts an existing window variable. Click **Variable** tab to create a new string variable.

Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value. For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad` for all the window title names starting with `((\w*)-Notepad`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

3. Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

4. In the **Wait before capturing the image (ms)** field, specify the delay time.

---

**Recommendation:** If you are capturing in a window that is accessed using Remote Desktop Protocol (RDP), set a minimum delay time of 1000 milliseconds to give the window time to load.

---

5. Select the **Filter the captured text** check box to filter the captured text.

Specify the text to filter out in the **Before** and **After** fields. For example, if the extracted text is `Name: ABC Inc. Location:`, to retrieve `ABC Inc.`, you must specify `Location:` in the **Before** field and `Name:` in the **After** field.

6. Select the **Trim the captured text** check box to trim the extra spaces.
7. Select the **Load Profile** check box and select an option to load the locale based on the ABBYY profile:

---

**Note:** ABBYY FineReader 12.2.27.12 is installed along with A2019 and does not require any additional setup.

---

- **Control Room file:** Uses a file that is available on the Control Room.
- **Desktop file:** Uses a file that is available on a device.
- **Variable:** Uses a file variable to specify the file location.

8. In the **Select locale** list, select the language of the device.

---

**Note:** Currently, only English and Japanese locales are supported. If you have selected an option from the **Select locale** list and the **Load Profile** option, the system considers the locale based on the **Load Profile** selection.

---

9. In the **Assign value to variable** list, select a string variable.
10. Click **Save**.

## Using Capture area action

Use the **Capture area** action to extract text from a specific area in an application window. You can filter the extracted text and assign it as a variable.

Follow these steps to use the **Capture area** action:

1. In the **Actions** palette, double-click or drag the **Capture area** action from the **OCR** package.
2. In the **Window title** field, select an option:
  - **Window**: Captures a window on a desktop. In the **Window title** field, specify the application title.
  - **Variable**: Inserts an existing window variable.

Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value. For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad` for all the window title names starting with `((\w*)-Notepad`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

3. Optional: Select the **Resize window** option to specify the window dimensions.
 

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

  - If the window is maximized when you record the task, this option is unselected.
  - If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

4. Specify the **X**, **Y**, **Width**, and **Height** coordinates.
5. Click **Capture region**.
 

The bot captures text from the visible area of the screen even if the target area is below the visible screen.
6. In the **Wait before capturing the image (ms)** field, specify the delay time.

---

**Recommendation:** If you are capturing in a window that is accessed using Remote Desktop Protocol (RDP), set a minimum delay time of 1000 milliseconds to give the window time to load.

---

7. Select the **Filter the captured text** check box to filter the captured text.
 

Specify the text to filter out in the **Before** and **After** fields. For example, if the extracted text is `Name: ABC Inc. Location:`, to retrieve `ABC Inc.`, you must specify `Location:` in the **Before** field and `Name:` in the **After** field.

8. Select the **Trim the captured text** check box to trim the extra spaces.
9. Select the **Load Profile** check box and select an option to load the locale based on the ABBYY profile:

---

**Note:** ABBYY FineReader 12.2.27.12 is installed along with A2019 and does not require any additional setup.

---

- **Control Room file:** Uses a file that is available on the Control Room.
- **Desktop file:** Uses a file that is available on a device.
- **Variable:** Uses a file variable to specify the file location.

10. In the **Select locale** list, select the language of the device.

---

**Note:** Currently, only English and Japanese locales are supported. If you have selected an option from the **Select locale** list and the **Load Profile** option, the system considers the locale based on the **Load Profile** selection.

---

11. In the **Assign value to variable** list, select a string variable.
12. Click **Save**.

## Office 365 Calendar package

The **Office 365 Calendar** package contains actions that enable you to automate meeting-related tasks in Office 365 Calendar.

### Before you start

Perform the following actions within the **Office 365 Calendar** package as part of using the set of available actions:

1. Use the **Connect** action to establish a connection to the Office 365 server.

See [Using the Connect action](#).

---

**Note:** Office 365 packages do not currently support Multi-Factor Authentication or Single Sign-on.

---

2. Use a combination of actions available in this package to automate tasks.

---

**Note:** To use actions from other Office 365 packages, establish a connection using the **Connect** action from that package.

---

3. Use the **Disconnect** action to terminate the connection.

### Actions in the **Office 365 Calendar** package

The **Office 365 Calendar** package includes the following actions:

---

**Note:** Some of the actions must be used within a **Loop** action to apply the action to each meeting in the calendar. See [Using Office 365 Calendar actions in a loop](#).

---

Action	Description
Add attachment	<p>Adds one or more attachments to a meeting. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p> <ul style="list-style-type: none"> <li>• Provide the session name that you used in the <b>Connect</b> action.</li> <li>• Select the files to attach from the Control Room or your desktop, or insert a file variable. Separate each file path with a comma.</li> </ul>
Add attendees	<p>Adds one or more attendees to a meeting and specifies whether attendance is optional or required. During run time, this action triggers an email notification to meeting attendees. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p> <ul style="list-style-type: none"> <li>• Provide the session name that you used in the <b>Connect</b> action.</li> <li>• Enter the attendee emails into the <b>Required</b> or <b>Optional</b> fields. Separate each email with a comma.</li> </ul>
Cancel meeting	<p> Cancels the meeting. During run time, this action triggers an email notification to meeting attendees. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p>
Connect	<p>Establishes a connection with the Office 365 server using your organization's client ID and tenant ID, and user credentials.</p> <p>See <a href="#">Using the Connect action</a>.</p>
Create meeting	<p>See <a href="#">Using the Create Meeting action</a>.</p>
Delete attendees	<p>Deletes attendees from a meeting. During run time, this action triggers an email notification to meeting attendees. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p> <ul style="list-style-type: none"> <li>• Provide the session name that you used in the <b>Connect</b> action.</li> <li>• Select an option to delete: <b>meeting</b> or <b>attendees</b>. To delete attendees, provide the email addresses of the attendees, separated by commas.</li> </ul>

Action	Description
Delete meeting information	<p>Deletes information related to a meeting such as the title or location. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p> <ul style="list-style-type: none"> <li>• Provide the session name that you used in the <b>Connect</b> action.</li> <li>• Select the meeting information to delete. The options are: <ul style="list-style-type: none"> <li>• Title</li> <li>• Location</li> <li>• Agenda</li> <li>• Reminder</li> <li>• Recurrence</li> <li>• Is all day</li> </ul> </li> </ul>
Disconnect	<p>Terminates the connection with the Office 365 server. Enter the session name that you used in the <b>Connect</b> action. Insert this action at the end of automation sequences that use actions from this Office 365 package.</p>
Get available meeting slot(s)	<p>See <a href="#">Using the Get available meeting slots action</a>.</p>
Modify meeting	<p>Modifies information for a meeting. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p> <ul style="list-style-type: none"> <li>• Provide the session name that you used in the <b>Connect</b> action.</li> <li>• Modify any of the following: <ul style="list-style-type: none"> <li>• Meeting start or end date.</li> <li>• Convert the meeting to all day.</li> <li>• Revise the meeting title.</li> <li>• Revise the agenda.</li> <li>• Update the location.</li> <li>• Update the reminder.</li> <li>• Update the recurrence, frequency, start date, and end date.</li> </ul> </li> </ul>
Respond to meeting	<p>Responds to a meeting as accepted, rejected, or tentative. You can also add a message to the response. Use this action within a <b>Loop</b> action to repeat this operation for each meeting in the calendar. See <a href="#">Loop package</a>.</p>

## Using the Create Meeting action

Use the **Create Meeting** action to specify a meeting agenda, attachments, attendees, duration, location, recurrence, and title. During run time, this action sends an invitation email to meeting attendees.

This action uses two Datetime variables to set the meeting start and end. Define the values before you start. The recurrence option also uses two Datetime variables to set the start and end. For more information, see [Your variables \(user-defined\)](#).

To create a meeting, do the following:

1. Enter the session name that you used in the **Connect** action.
2. Enter the calendar name.  
This field is case-sensitive.  
The prepopulated value is Calendar; this is the default Office 365 setting.
3. Specify the meeting start date and time.  
Select a DateTime variable from the drop-down list.
4. Specify the meeting end date and time.  
Select a DateTime variable with a value that is the same or after the start time.
5. Optional: Mark the **All day meeting** option.  
For an all day meeting, ensure that there is a one-day difference between the start and end dates.
6. Enter attendee email addresses, separated by commas.
7. Optional: Enter the following details:

- Attach a file from the Control Room, Desktop, or insert a File variable.
- Enter a meeting title.
- Enter a meeting location.
- Enter an agenda.
- Set a reminder.
- Set a recurrence with the following options:
  - Select the recurrence type: **Daily**, **Weekly**, **Monthly**, or **Yearly**.
    - For **Weekly** recurrence, mark the days of the week on which the meeting takes place.
    - For **Monthly** recurrence, either enter the numerical date or select a day.

For example, to schedule a meeting that takes place on the twenty-fifth day of the month enter 25 in the **Specific date** field.

---

**Note:** If you enter 31 in the **Specific date** field, for the months with less than 31 days, the meeting will schedule for the last day of the month.

---

To schedule it for the last Monday of the month, select **Last** from the **Occurrence** drop-down list and **Monday** from the **Weekday** drop-down list.

- For **Yearly** recurrence, either enter the numerical date and month or select a day and month.

For example, to schedule a meeting that takes place on March 15, enter 15 in the **Specific Date** field and March in the **Month** field. To schedule it for the second Friday in March, select **Second** from the **Occurrence** drop-down list, select **Friday** from the **Weekday** drop-down list, and **March** from the **Month** drop-down list.

- Enter the recurrence frequency.
- Specify the recurrence start by selecting a DateTime variable from the drop-down list.
- If the recurrence has an end date, select a DateTime variable from the drop-down list.

## Using the Get available meeting slots action

Use the **Get available meeting slots** action to retrieve available time slots for attendees in a specified date and time range. This action supports scheduling across time zones.

This action considers a time slot as available if it is within an attendee's working hours and if the attendee has not already accepted a meeting for that time. If an attendee tentatively responds or does not respond to an invitation, this action considers them available.

To retrieve available time slots, perform the following steps:

1. Enter the session name that you used in the **Connect** action.
2. Enter the email addresses of the attendees, separated by commas.
3. Enter the duration of the meeting in minutes.
4. Specify the range start date and time by selecting a DateTime variable from the drop-down list.
5. Specify the range end date and time by select a DateTime variable with a value that is the same or after the start time.
6. Optional: Select the **Check for timeslots outside working hours** option.
7. Select a Table variable from the drop-down list.
8. Click **Save**.

## Using Office 365 Calendar actions in a loop

You must use certain Office 365 Calendar actions within a **Loop** action.

This action uses two Datetime variables to set the meeting start and end. Define the values before you start. For more information, see [Your variables \(user-defined\)](#).

To use an Office 365 Calendar action within a loop, follow these steps:

1. Double-click or drag the **Loop** action from the **Loop** package in the **Actions** palette.
2. Select the **For each meeting in calendar** iterator.
3. Enter the session name that you used in the **Connect** action.
4. Enter the calendar name.  
This field is case-sensitive.  
The prepopulated value is Calendar; this is the default Office 365 setting.
5. Select whether to loop through **All meetings in the calendar** or only meetings with the specific title.
6. Specify the meeting start date and time.  
Select a DateTime variable from the drop-down list.
7. Specify the meeting end date and time.  
Select a DateTime variable with a value that is the same or after the start time.
8. Optional: Enter the location.
9. Optional: Enter the duration in minutes.
10. Optional: Mark the **All day meeting** option.  
For an all day meeting, ensure that there is a one-day difference between the start and end dates.
11. Optional: Enter the meeting owner's email address.
12. Select or create a record variable to hold the output.

## Using the Connect action

Use the **Connect** action to establish a connection with the Office 365 server using your organization's (client ID and tenant ID) and user credentials. All of the fields in this action accept a credential from the Credential Vault or a user-input value.

**Note:**

- The **Connect** action does not currently support Multi-Factor Authentication or Single Sign-on.
- The best practice is for a system administrator to perform the following steps.

1. Log in to the [Azure portal](#) using your Office 365 credentials.
2. Register your application with the Microsoft identity platform to obtain the client ID and tenant ID. See [Register your app](#).
3. Grant the required permissions for **Microsoft Graph** to the application. See [Permissions for application](#).
4. To add a client secret, you must first subscribe to Azure. See [Subscribe to Azure](#).
5. Add a client secret. See [Add a client secret](#).

For an example on how to setup and connect to the Office 365 OneDrive package, see [Working with the Office 365 OneDrive package](#).

To establish a connection to the Office 365 server, follow these steps:

1. In the **Actions** palette, double-click or drag the **Connect** action from the package you want to use.
2. In the **User session** field, enter a name for this session.  
Provide this session name in subsequent actions from this package.
3. In the **Username** and **Password** fields, enter your user credentials or insert them from the Credential Vault.
4. In the **Tenant ID** field, enter the unique ID for your Office 365 subscription or insert it from the Credential Vault.
5. In the **Client ID** field, enter the Office 365 client or insert it from the Credential Vault.
6. In the **Client Secret Key** field enter your access token or insert it from the Credential Vault.
7. Click **Save**.

*Permissions for application*

After registering the Office 365, you must grant certain permissions to the application. These permissions are required to enable Office 365 packages to perform various operations.

To grant permissions to an application, see [Add permissions](#).

**Note:** You must be the co-owner of the application for which you are configuring permissions.

The following [Delegated permissions](#) for **Microsoft Graph** are required for Office 365 packages:

Common permissions	
	<a href="#">openid</a>
	<a href="#">offline_access</a>
	<a href="#">User.Read</a>
	<a href="#">User.ReadBasic.All</a>
One Drive	
	<a href="#">Files.ReadWrite.All</a>

	Sites.ReadWrite.All
Calendar	
	Calendars.Read
	Calendars.Read.Shared
	Calendars.ReadWrite
Email	
	Mail.Read
	Mail.ReadWrite
	MailboxSettings.Read
	MailboxSettings.ReadWrite

Apart from the above permissions, you can grant additional permissions based on your requirements. See, [Microsoft Graph permission reference](#).

## Office 365 Excel package

The Office 365 Excel package contains actions that enable you to automate tasks in the online version of Microsoft Excel.

### Choosing the Excel package in Automation 360

Automation 360 includes packages to support three types of Microsoft Excel usage. For optimal results, use the package that corresponds to the type of Excel that is available on the device you are running bots on.

- **No Excel installed:** If you do not have Microsoft Excel installed on the device on which you are running bots to automate Excel-related processes, use the Excel basic package.
- **Desktop Excel installed:** If you have a desktop version of Microsoft Excel installed on your computer, use the Excel advanced package in your bots.
- **Online Office 365 Excel only:** If you are using Microsoft Excel 365 on a web browser, use the Office 365 Excel package for automating tasks related to Excel.

### Before you start

1. Use the **Connect** action to establish a connection to the Office 365 server.

See [Using the Connect action](#).

---

**Note:** Office 365 packages do not currently support Multi-Factor Authentication or Single Sign-on.

---

2. Use the **Open** action to select a workbook, or the **Create** action to create a new workbook. See [Workbook operations](#).
3. **Optional:** If the workbook contains more than one worksheet, use the **Activate sheet** action to specify which worksheet to use.

4. Use a combination of actions available in this package to automate tasks.

---

**Note:** To use actions from other Office 365 packages, establish a connection using the **Connect** action from that package.

---

5. Use the **Close** action to exit from the workbook.
6. Use the **Disconnect** action to terminate the connection.

## Actions in the Office 365 Excel package

The actions in the Office 365 Excel package enable you to perform the following operations:

Operations	Description
Cell	Perform operations related to cell and range operations, such as append, delete, format, get properties, and insert.  See <a href="#">Cell operations</a>
Row and column	Perform operations related to column and row operations such as autofit, delete, and read.  See <a href="#">Column/Row operations</a> .
Table	Perform operations related to the table operations such as create, delete, filter, get properties, rename, and sort. See <a href="#">Table operations</a> .
Workbook	Automate opening, closing, and creating a workbook.  See <a href="#">Workbook operations</a> .
Worksheet	Perform operations related to worksheet operations, such as activate, delete, find, get worksheet names, hide, retrieve worksheet count, and show.  See <a href="#">Worksheet operations</a> .

## Cell operations

The **Office 365 Excel** package contains actions that you can use to automate tasks related to cell and range operations, such as append, delete, format, get properties, and insert.

The **Office 365 Excel** package includes the following actions:

Action	Description
Delete cell	<p>Deletes the <b>Active cell</b> or a <b>Specific cell</b> from the current worksheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• If you select <b>Specific cell</b>, enter the cell location. For example A1.</li> <li>• Select one of the following options: <ul style="list-style-type: none"> <li>• <b>Shift cells left</b>: Deletes the specified cell and shifts the cell one position to left.</li> <li>• <b>Shift cells up</b>: Deletes the specified cell and shifts the cell one position up.</li> <li>• <b>Entire row</b>: Deletes the entire row that contains the cell that you have specified to delete.</li> <li>• <b>Entire column</b>: Deletes the entire column that contains the cell that you have specified to delete.</li> </ul> </li> </ul>
Delete range	<p>Deletes a specific range of cells.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the cell range. For example A1 : B4. This deletes an area consisting of the first four rows by the first two columns.</li> <li>• Use the radio buttons to specify whether to shift the cells up or left. <ul style="list-style-type: none"> <li>• <b>Shift cells up</b>: Deletes the specified cells and shifts the cells up by the number of rows deleted.</li> <li>• <b>Shift cells left</b>: Deletes the specified cells and shifts the cells left by the number of columns deleted.</li> </ul> </li> </ul>
Format cell	See <a href="#">Using the Format cell action</a> .
Get cell	<p>Retrieves the value of a cell.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Active cell</b> or <b>Specific cell</b> option and enter the cell location.</li> <li>• Assign the output to a String variable. To perform mathematical operations, convert the string to a number. See the <a href="#">String &gt; Convert action</a>.</li> </ul>
Get cell/text color	See <a href="#">Using the Get cell/text color action</a> .

Action	Description
Get multiple cells	<p>Retrieves the value(s) of multiple cells within a worksheet and assigns the output to a variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Multiple cells</b> or <b>All cells</b> option. If you select <b>Multiple cells</b>, enter the cell range, such as <code>A1:D1</code>. This retrieves the values of the first four cells in the top row.</li> <li>• Assign the output to a String variable. To convert the string to a number, see the <a href="#">String &gt; Convert action</a>.</li> </ul>
Go to cell	<p>Moves the cursor to a specific cell in the worksheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select from the following options: <ul style="list-style-type: none"> <li>• <b>Specific cell</b>: Moves to the specified cell address.</li> <li>• <b>One cell to the left</b>: Moves one cell left.</li> <li>• <b>One cell to the right</b>: Moves one cell right.</li> <li>• <b>One cell above</b>: Moves one cell up.</li> <li>• <b>One cell below</b>: Moves one cell down.</li> <li>• <b>Beginning of row</b>: Moves to the first cell in the same row.</li> <li>• <b>End of row</b>: Moves to the last cell that contains data in the same row.</li> <li>• <b>Beginning of column</b>: Moves to the first cell in the same column.</li> <li>• <b>End of column</b>: Moves to the last cell that contains data in the same column.</li> </ul> </li> </ul>
Insert cell	<p>Inserts a value to the <b>Active cell</b> or a <b>Specific cell</b> in the current worksheet without overwriting the existing value.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• If you select <b>Specific cell</b>, enter the cell location. For example <code>A1</code>.</li> <li>• After inserting the cell, you can: <ul style="list-style-type: none"> <li>• <b>Shift cells down</b>: Shifts the existing values down by the specified number of rows.</li> <li>• <b>Shift cells right</b>: Shifts the existing values right by the specified number of columns.</li> </ul> </li> </ul>

Action	Description
Insert range	<p>Inserts the range into the current worksheet without overwriting the existing value.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the cell range. For example A1:B4. This inserts a range of cells consisting of the first four rows by the first two columns.</li> <li>• After inserting the cell, you can: <ul style="list-style-type: none"> <li>• <b>Shift cells down:</b> Shifts the existing values down by the specified number of rows.</li> <li>• <b>Shift cells right:</b> Shifts the existing values right by the specified number of columns.</li> </ul> </li> </ul>
Paste cell	<p>Copies a value from a cell and pastes to a specified cell. If there is a value in the destination cell, this action will overwrite the value.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell from which to copy the value. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>• Enter the destination cell address to paste the value. For example, B3.</li> </ul>
Read cell format	<p>Gets the format of the <b>Active cell</b> or <b>Specified cell</b> and assigns the output to a string variable. This action returns a blank value if the specified cell does not contain a formula.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell from which to read the format. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>• Select a String variable to store the cell format from the <b>Assign the output to variable</b> list.</li> </ul>

Action	Description
Read cell formula	<p>Gets the formula available in the <b>Active cell</b> or <b>Specified cell</b> and assigns the output to a string variable. This action returns a blank value if the specified cell does not contain a formula.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell from which to read the formula. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>• Select a string variable to store the name of the formula from the <b>Assign the output to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Set cell	<p>Sets a value in the <b>Active cell</b> or <b>Specific cell</b> in a Microsoft Excel spreadsheet or a CSV file. You can also use this action to set a formula.</p> <ul style="list-style-type: none"> <li>• Select the <b>Active cell</b> or <b>Specified cell</b> option to specify the cell in which to set the value. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> </ul> <hr/> <p><b>Note:</b> You can enter a cell range in the <b>Specific cell</b> field to set a particular value in all the cells of the range. For example, to set a value of 5 on all cells in the second row and from the first through third column, enter <code>A2:C2</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the value to set in the <b>Cell value</b> field.</li> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Set cell color	<p>Sets a color to the background or text of the <b>Active cell</b> or <b>Specific cell</b>.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select the <b>Active cell</b>, <b>Specified cell</b>, or <b>Cell range</b> option to specify the cell in which to set the color. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>• Select which to apply the color to: the <b>Cell</b> or <b>Text within cell</b>.</li> <li>• Enter the value to set in the <b>Cell value</b> field. Use either the color name or the hex value. For a list of color names and corresponding hex values, see <a href="#">Frequently used cell colors</a>.</li> </ul>

Action	Description
Set cell formula	<p>Sets the formula of the specified cell.</p> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select the <b>Active cell</b>, <b>Specified cell</b>, or <b>Cell range</b> option to specify the cell in which to set the color. If you have selected the <b>Specified cell</b> option, specify the address of the cell in the field.</li> <li>Enter the value to set in the <b>Cell formula</b> field without an "=".</li> </ul>

#### Using the Format cell action

Use the **Format cell** action to set the format of a cell or group of cells.

To format a cell or group of cells, do the following:

1. Double-click or drag the **Format cell** action.
2. Enter the name of the session used to open the workbook with the **Open** action.
3. Select the **Active cell**, **Specific cell**, or **Multiple cells** option and provide cell location or cell range, as necessary.
4. Mark the **Font** option to modify any of the following:
  - Font name
  - Font size (between 8 and 72)
  - Bold or italicize
  - Underline
  - Font color (accepts color name or hex value). For a list of color names and corresponding hex values, see [Frequently used cell colors](#).
5. Mark the **Alignment** option, then use the drop-down lists to modify the vertical or horizontal alignment.
6. Mark the **wrap text** option to expand the cell(s) vertically to show long strings of text.
7. Mark the **Merge Type** option to select the any of the following operations:
  - Merge and center
  - Merge across
  - Merge cells
  - Unmerge
8. Click **Save**.

#### Frequently used cell colors

The table below contains color names and their corresponding hex values. These are the most frequently used options for formatting worksheets.

Name	Hex
Aqua	#00FFFF
Black	#000000
Blue	#0000FF
Gray	#808080
Green	#008000

Name	Hex
Fuchsia	#FF00FF
Lime	#00FF00
Maroon	#800000
Navy	#000080
Olive	#808000
Purple	#800080
Red	#FF0000
Silver	#C0C0C0
Teal	#008080
White	#FFFFFF
Yellow	#FFFF00

#### *Using the Get cell/text color action*

Use the **Get cell/text color** action to get the color of the background or text in a cell. This action retrieves the color of a cell as RGB values. For example, if the background or text in a cell is of red color, the value retrieved is 255,0,0.

To get the color of the background or text in a cell, do the following:

1. Double-click or drag the **Get cell/text color** action.
2. Enter the name of the session used to open the workbook with the **Open** action.
3. Select the **Active cell** option to get the color from the current active cell or the **Specific cell** option to get the color from the address of the cell you have specified.
4. Select the **Cell color** option to get the background color of the cell, the **Text color** option to get the color of the text, or both.
5. Specify whether to retrieve the cell color by name or as an RGB value.
6. Select a variable from the **Assign the output to variable** list to assign the cell/text color to a List variable.
7. Click **Save**.

If both cell and text colors are retrieved, the List variable contains the cell color at index 0 and text color at index 1.

## Column/Row operations

The **Office 365 Excel** package contains actions that you can use to automate tasks related to column and row operations such as autofit, delete, insert, and read.

The **Office 365 Excel** package includes the following actions:

Actions	Description
Autofit columns	Adjusts the width of the columns in the worksheet in the specified session. Use Enter the name of the session used to open the workbook with the <b>Open</b> action.

Actions	Description
Autofit rows	Adjusts the height of the rows in the worksheet in the specified session. Use Enter the name of the session used to open the workbook with the <b>Open</b> action.
Delete row/column	See <a href="#">Using Delete action for rows or columns</a> .
Get row count	Retrieves the number of rows that contain data in the worksheet. <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Assign the output value to a Number variable. To convert the variable to a String variable, see the <a href="#">Number &gt; Convert</a> action.</li> </ul>
Insert row/column	See <a href="#">Using Insert action for rows or columns</a> .
Read column	Extracts data from a column and stores it in a List variable. <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select the <b>From active cell</b> or <b>From specific cell</b> option to specify the starting point.</li> <li>You can also select the <b>Read full column</b> option to extract data for the entire column.</li> <li>Assign the output value to a List variable.</li> </ul>
Read row	Extracts data from a row and stores it in a Record variable. <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select the <b>From active cell</b> or <b>From specific cell</b> option to specify the starting point.</li> <li>You can also select the <b>Read full row</b> option to extract data for the entire row.</li> <li>Assign the output value to a Record variable.</li> </ul>

#### *Using Delete action for rows or columns*

Use the **Delete** action to remove rows or columns from the current worksheet.

To delete rows or columns in a worksheet, do the following:

1. Double-click or drag **Office 365 Excel > Delete**.
2. Enter the name of the session used to open the workbook with the **Open** action.

**3.** Select one of the following:

- Row operations
  - a.** Select the **Delete Row(s) at** option to delete all of the cells in a specific row. Specify the row number to delete in the field. For example, to delete the tenth row in the worksheet, enter 10 in the field.
  - b.** Select the **Delete Row(s) by** option to delete all of the cells in either:
    - the row of the active cell.
    - a specific range of cells. Specify the range to delete. For example, to delete the first five rows, enter 1 : 5 in the field.
  
- Column operations
  - a.** Select the **Delete Column(s) at** option to delete all of the cells in a specific column. Specify the address of the column to delete in the field. For example, to delete column 'D' in the worksheet, enter D in the field.
  - b.** Select the **Delete Columns(s) by** option to delete all of the cells in either:
    - the column of the active cell.
    - a specific range of cells. Specify the range to delete. For example, to delete the first five columns, enter A : E in the field.

**4.** Click **Save**.

*Using Insert action for rows or columns*

Use the **Insert** action to create rows or columns in the current worksheet.

To insert or delete rows or columns in a worksheet, do the following:

- 1.** Double-click or drag **Office 365 Excel > Insert**.
- 2.** Enter the name of the session used to open the workbook with the **Open** action.

### 3. Select one of the following:

- Row operations
  - a. Select the **Insert Row(s) at** option to insert a row and specify the location where to insert the row in the field. For example, to insert a row of cells in the tenth row in the worksheet, enter 10 in the field.
  - b. Select the **Insert Row(s) by** option to insert all of the cells in either:
    - the row of the active cell.
    - a specific range of cells. Specify the range where to insert the row. For example, to insert a row of cells in the first five rows in the worksheet, enter 1:5 in the field.
  
- Column operations
  - a. Select the **Insert Column(s) at** option to insert a column and specify the location where to insert the row in the field. For example, to insert a column of cells in column 'D' in the worksheet, enter D in the field.
  - b. Select the **Insert Columns(s) by** option to insert all of the cells in either:
    - the column of the active cell.
    - a specific range of cells. Specify the range to insert the column. For example, to insert a row of cells in the first five columns, enter A:E in the field.

### 4. Click **Save**.

## Table operations

The **Office 365 Excel** package contains various actions that you can use to automate tasks related to the table operations such as create, delete, filter, get properties, rename, and sort.

The **Office 365 Excel** package includes the following actions:

Actions	Description
Create table	<p>Creates a new table in the specified table range.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the table name.</li> <li>• Enter the cell range in which to create the table. For example, A1:D4.</li> <li>• <b>Optional:</b> Select the <b>Table has headers</b> option to establish the first row as the header row.</li> </ul>
Delete table	<p>Deletes the table in the active worksheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the table name.</li> </ul>

Actions	Description
Get table column	<p>Retrieves the column values of a specified table and column index, and assigns the values to a List variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the table name.</li> <li>• Enter the column index. For example, enter 5 to indicate the fifth column from the left.</li> <li>• Select a List variable to store the values.</li> </ul>
Get table names	<p>Retrieves the names of all the tables in a workbook and assigns them to a List variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• <b>Optional:</b> Select whether to specify a sheet either by index or name.</li> <li>• Select a List variable to store the values.</li> </ul>
Get table row	<p>Retrieves the row values of a specified table and row index, and assigns the values to a Record variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the table name.</li> <li>• Enter the row index. For example, enter 5 to indicate the fifth row from the top.</li> <li>• Select a Record variable to store the values.</li> </ul>
Get table row count	<p>Retrieves the row count of a specified table and assigns the values to a number variable.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the table name.</li> <li>• Select a Number type variable to store the values. To convert the variable to a String type variable, see the <a href="#">Number &gt; Convert</a> action.</li> </ul>
Rename table	<p>Renames a table.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the current table name.</li> <li>• Enter a new table name.</li> </ul>

## Workbook operations

The **Office 365 Excel** package contains actions that you can use to automate opening, closing, or creating a new workbook.

The **Office 365 Excel** package includes the following actions:

Actions	Description
Close	Closes the workbook. Use Enter the name of the session used to open the workbook with the <b>Open</b> action.
Create workbook	<p>Creates a new workbook.</p> <ul style="list-style-type: none"> <li>• Enter Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Provide a <b>File Path</b> containing the new workbook name with one of the following extensions: .xls, .xlsm, .xlsx. Either enter the file path or select a String variable.</li> </ul> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>Accounts/SalesReport.xlsx</code>.</p>
Open	See <a href="#">Using the Open action</a> .

### *Using the Open action*

Use this action to open a workbook. Insert this action at the start of your automation sequences.

To open a workbook, do the following:

1. Double-click or drag the **Open** action.
2. Provide the username either by selecting a Credential variable or entering an unencrypted value.
3. Enter a **Session name**.  
Use this same session name in subsequent actions to associate them with this workbook.
4. Enter the **File Path** or insert a file variable.  
For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter `Accounts/SalesReport.xlsx`.
5. If the sheet contains a header row, mark the **Sheet contains header** option.
6. Click **Save**.

## Worksheet operations

The **Office 365 Excel** package contains actions that you can use to automate tasks related to worksheet operations, such as delete, find, get worksheet names, hide, retrieve worksheet count, and show.

The **Office 365 Excel** package includes the following actions:

Actions	Description
Copy worksheet	See <a href="#">Using the Copy worksheet action</a> .

Actions	Description
Create worksheet	<p>Adds an empty sheet in the current workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter a <b>Worksheet name</b> of up to 31 characters. The name cannot contain the following characters: \ / ? * [ ]</li> </ul>
Delete worksheet	<p>Deletes a spreadsheet from the current workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Specify either an index number in the <b>Sheet by Index</b> field or a name in the <b>Sheet by Name</b> field for the worksheet. The index number is the number assigned to a worksheet. For example, if you want to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.</li> </ul> <hr/> <p><b>Note:</b> You can delete a worksheet only if the workbook contains more than one worksheet.</p> <hr/>
Get current worksheet name	<p>Retrieves the name of the currently active worksheet.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a string variable that you want to use to store the name of the worksheet from the <b>Assign the output to variable</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>
Get worksheet names	<p>Retrieves the names of all the worksheets in the workbook.</p> <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Select a list variable to store the worksheet names from the <b>Assign the output to variable</b> list.</li> </ul>

Actions	Description
Hide worksheet	<p>Hides a worksheet from the current workbook.</p> <ul style="list-style-type: none"> <li>Specify the name of the worksheet to hide in the <b>Enter worksheet name to hide</b> field.</li> </ul> <hr/> <p><b>Note:</b> You can hide a worksheet only if the workbook contains more than one worksheet.</p> <hr/> <ul style="list-style-type: none"> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Rename worksheet	<p>Renames a worksheet in the current workbook.</p> <ul style="list-style-type: none"> <li>Specify the index number or name of the worksheet to rename in the <b>Sheet by Index</b> or <b>Sheet by Name</b> field.</li> </ul> <p>The index number is the number assigned to a worksheet. For example, if you want to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.</p> <hr/> <p><b>Note:</b> You cannot rename the worksheet if a worksheet with the same name already exists in the workbook.</p> <hr/> <ul style="list-style-type: none"> <li>Enter the new worksheet name that is under 31 characters.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> </ul>
Retrieve sheet count	<p>Gets the number of sheets available in the current workbook and stores it in a number variable.</p> <ul style="list-style-type: none"> <li>Select the appropriate option to specify whether to include the hidden worksheet or not and assign the count to a variable.</li> <li>Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>Select a number variable that you want to use to store the name of the worksheet from the <b>Select the variable to assign to</b> list. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</li> </ul>

Actions	Description
Show worksheet	Shows the hidden worksheet. <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Enter the <b>Worksheet name</b>.</li> </ul>
Switch to sheet	Activates a particular sheet in a Microsoft Excel file. <ul style="list-style-type: none"> <li>• Enter the name of the session used to open the workbook with the <b>Open</b> action.</li> <li>• Specify whether to activate the <b>Sheet by Index</b> (numerical value) or <b>Sheet by Name</b>.</li> </ul>

#### *Using the Copy worksheet action*

Use the **Copy worksheet** action to copy values of a worksheet from one worksheet to another. This action overwrites any existing values. To move values from one worksheet to another without overwriting existing values, use the **Append worksheet** action.

Open the workbook(s) containing the source and target worksheets. See [Using the Open action](#).

---

**Note:** This action identifies the destination and source workbooks by the session names used to open them. If opening two workbooks, enter a session name for the source workbook that is different than the one used to open the destination workbook.

---

To copy the values of a worksheet into another, do the following:

1. Double-click or drag the **Copy worksheet** action.
2. Enter the name of the session that you used to open the destination workbook in the **Open** action.
3. If the workbook contains more than one worksheet, mark the **Specific Sheet** option, then enter the index number or name of the source worksheet.
  - The index number represents the position of the worksheet in the workbook. For example, to perform an operation on the worksheet at the third position in the workbook, enter 3 in the field.
  - The sheet name field is case insensitive.
4. Enter the name of the session that you used to open the source workbook in the **Open** action.
5. If the workbook contains more than one worksheet, mark the **Specific Sheet** option, then enter the index number or name of the destination worksheet.
6. Click **Save**.

## Office 365 One Drive package

The **One Drive** package contains actions that enable you to automate many of the repetitive tasks in Microsoft cloud storage.

### How to use the actions in the **One Drive** package

Perform the following actions within the **One Drive** package as part of using the set of available actions:

1. Use the **Connect** action to establish a connection to the Office 365 server.

See [Using the Connect action](#).

---

**Note:** Office 365 packages do not currently support Multi-Factor Authentication or Single Sign-on.

---

2. Use a combination of actions available in this package to automate tasks.

---

**Note:** To use actions from other Office 365 packages, establish a connection using the **Connect** action from that package.

---

3. Use the **Disconnect** action to terminate the connection.

For an example on how to setup and connect to the Office 365 OneDrive package, see [Working with the Office 365 OneDrive package](#).

### Actions in the **One Drive** package

Use the actions in the **One Drive** package to perform an operation on a single file or folder. To perform the operation on every file in a folder, use that action in a loop. See [Using One Drive actions in a loop](#).

The **One Drive** package includes the following actions:

Action	Description
Check permission	<p>Checks for read, write, or delete permission for a file or folder in your OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Provide the file or folder name and path, file or folder link, or select a predefined string variable.</li> <li>• Specify which permission type to verify: <b>Read</b> or <b>Read &amp; Write</b>.</li> <li>• Select a predefined Boolean type variable to hold the output, or click the icon on the right to create a new variable.</li> </ul> <p>The Boolean type variable will provide a true (user has permission) or false (user does not have permission) response.</p>

Action	Description
Connect	<p>Establishes a connection with the Office 365 server using your organization's client ID and tenant ID, and user credentials.</p> <p>See <a href="#">Using the Connect action</a>.</p>
Copy file or folder	<p>Copies a file or folder from one folder to another in your OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Select whether to copy a file or folder.</li> <li>• Provide the source and destination file/folder names and paths or file/folder link. Either enter the values or insert a string variable.</li> </ul> <p>To obtain the file or folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> If there is file or folder with the same name in the destination folder, select the <b>Override existing file/folder</b> option which replaces the existing file or folder with the one being copied.</li> </ul>
Create folder	<p>Creates a folder in a specific directory in your OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Enter the parent folder name and path, or folder link. Either enter the values or insert a string variable.</li> </ul> <p>To obtain the folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a folder named Q1, located in the Survey Results folder, enter <code>/Survey Results/Q1</code>.</p> <ul style="list-style-type: none"> <li>• Enter the new folder name. Either enter the values or insert a string variable.</li> </ul>

Action	Description
Delete file or folder	<p>Deletes a file or folder in a specific directory in your OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Select whether to delete a file or folder.</li> <li>• Provide the name and path, or file or folder link. Either enter the values or insert a string variable.</li> </ul> <p>To obtain the file or folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/>
Download file	<p>Downloads a file from a specific directory in your OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Provide the file name and path, or file link. Either enter the values or insert a predefined string variable.</li> </ul> <p>To obtain the file link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the destination folder path or select a predefined string variable.</li> <li>• <b>Optional:</b> If there is file or folder with the same name in the destination folder, select the <b>Override existing file/folder</b> option which replaces the existing file or folder with the one being copied.</li> </ul>

Action	Description
Export as PDF	<p>Exports an existing file in your OneDrive as a PDF. This action supports the following file extensions: doc, docx, oentry, odp, pps, ppt, pptx, tf, xls, and xlsx.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Provide the file name and path, or file link. Either enter the values or insert a predefined string variable.</li> </ul> <p>To obtain the file link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/> <ul style="list-style-type: none"> <li>• Enter the export folder name and path or select a predefined string variable.</li> <li>• <b>Optional:</b> If there is file or folder with the same name in the destination folder, select the <b>Override existing file/folder</b> option which replaces the existing file or folder with the one being copied.</li> </ul>

Action	Description
Find files and folders	<p>Finds files and folders in a specific directory in your OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Provide directory details in the <b>Folder to search</b> field: enter the folder name and path, or folder link. Either enter the values or insert a string variable.</li> </ul> <p>To obtain the folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a folder named Q1, located in the Survey Results folder, enter /Survey Results/Q1.</p> <ul style="list-style-type: none"> <li>• Specify whether to search for <b>All items in folder</b> or a <b>Specific file (or folder)</b>.</li> </ul> <hr/> <p><b>Note:</b> The <b>Drive Item Name</b> field accepts wildcard characters in the file name and extension. For example, to search for all documents with extension docx, enter *.docx in the <b>Specific file (or folder)</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• Assign the output to a table variable.</li> </ul> <p>The variable will hold the following file or folder details: Name, ID, CreatedBy, CreationDate, LastModifiedBy, LastModificationDate, and ParentFolderPath.</p>

Action	Description
Get file or folder information	<p>Retrieves information for a specific file or folder from OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Provide the file or folder name and path, or file/folder link. Either enter the values or insert a string variable.</li> </ul> <p>To obtain the file or folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/> <ul style="list-style-type: none"> <li>• Assign the output to a record variable.</li> </ul> <p>The variable will hold the following file or folder details: Name, ID, CreatedBy, CreationDate, LastModifiedBy, LastModificationDate, and ParentFolderPath.</p>
Move file or folder	<p>Moves a file or folder from one folder to another in OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Select whether to move a file or folder.</li> <li>• Provide the source and destination file or folder names and paths, or file/folder links. Either enter the values or insert a string variable into the two fields.</li> </ul> <p>To obtain the file or folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> If there is file or folder with the same name in the destination folder, select the <b>Override existing file/folder</b> option which replaces the existing file or folder with the one being copied.</li> </ul>

Action	Description
Rename file or folder	<p>Renames a file or folder in a specific directory in OneDrive.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Select whether to rename a file or folder.</li> <li>• Provide the current and new file or folder names, or file/folder link. Either enter the values or insert a string variable.</li> <li>• To obtain the file or folder link, copy the link generated from <i>Share OneDrive files and folders</i></li> <li>• <b>Optional:</b> If there is file or folder with the same name in the destination folder, select the <b>Override existing file/folder</b> option which replaces the existing file or folder with the one being copied.</li> </ul>
Restore last version	<p>Restores a file to the last version. If you restore a file to its previous version, you will lose the current version.</p> <ul style="list-style-type: none"> <li>• Enter the user session that you provided in the <b>Connect</b> action.</li> <li>• Provide the file name and path, or file link. Either enter the values or insert a predefined string variable.</li> </ul> <p>To obtain the file or folder link, copy the link generated from <i>Share OneDrive files and folders</i></p> <p>For example, to perform this action on a file named SalesReport.xlsx, located in the Accounts folder, enter <code>/Accounts/SalesReport.xlsx</code>.</p> <hr/> <p><b>Note:</b> The forward slash that indicates that a file or folder is located in the root directory is optional.</p> <hr/>

Action	Description
Upload file	<p>Uploads a file to a specific directory in OneDrive.</p> <ul style="list-style-type: none"> <li>Enter the user session that you provided in the <b>Connect</b> action.</li> <li>Provide the file name and path on the local directory. Either enter the values or insert a predefined string variable.</li> </ul> <p>For example, D:/Mydata/HR/EmployeeSurvey.xlsx.</p> <ul style="list-style-type: none"> <li>Provide the upload folder name and path, or folder link. Either enter the values or insert a string variable.</li> </ul> <p>To obtain the folder link, copy the link generated from <a href="#">Share OneDrive files and folders</a></p> <p>For example, to perform this action on a folder named Q1, located in the Survey Results folder in home directory, enter /Survey Results/Q1</p> <hr/> <p><b>Note:</b> You cannot provide the private folder path from one drive as it is not supported.</p> <hr/> <ul style="list-style-type: none"> <li><b>Optional:</b> If there is file or folder with the same name in the destination folder, select the <b>Override existing file/folder</b> option which replaces the existing file or folder with the one being copied.</li> </ul>

## Using One Drive actions in a loop

Use the **Find files and folder** action to return a table of files and their properties inside of a specified folder, the **Loop** action to loop through each row in the table, and a **One Drive** action to perform an operation on every file in the table.

To perform an action on every file in a folder, do the following steps:

1. Double-click or drag **One Drive > Find files and folders**.
2. Provide your username with either a credential variable or an unencrypted value.
3. Enter the file path of the folder in which to perform the search.
4. Select the **All items in folder** option.  
You can alternatively select **Specific file (or folder)** to limit the search to a specific folder on your OneDrive.
5. Select or create a table variable to hold the output.  
The table variable holds information on files and folders in rows, under the following columns: name, id, createdBy, creationDate, lastModifiedBy, lastModificationDateTime, parentFolder, and Path.
6. Double-click or drag the **Loop** action.
7. Select the **For each row in table** iterator.
8. Select the table variable holding the output from step 5.
9. Select or create a record variable to temporarily hold each row.

Insert the action inside of the **Loop** container that you want to repeat on every file in the folder. This example uses the **Download file** action.

**10.** Double-click or drag **Outlook > Download file**.

**11.** Provide your username with either a credential variable or an unencrypted value.

**12.** Enter the following in the **File name including path** field, replacing the generic variable names with the names of the record variables from step 10:

```
$RecordVariable[7]$/RecordVariable[0]
```

**13.** Enter the path to the folder where to download the files.

**14.** Click **Save**.

## PDF package

Use the **PDF** package to automate various operations on a PDF file.

The **PDF** package enables you to perform the following tasks:

- Encrypt or decrypt a PDF file.
- Extract text from a PDF file.
- Convert a PDF file to an image.
- Merge several PDF files into a single file.
- Split a single PDF file into multiple files.

It is not necessary to have a PDF reader installed on your device.

## Actions in the PDF package

The **PDF** package includes the following actions:

Action	Description
Decrypt document	See <a href="#">Using the Decrypt document action</a> .
Encrypt document	See <a href="#">Using the Encrypt document action</a> .
Extract field	See <a href="#">Using the Extract field action</a> .
Extract image	See <a href="#">Using the Extract image action</a> .
Extract text	See <a href="#">Using the Extract text action</a> .
Get property	See <a href="#">Using the Get property action</a> .
Merge documents	See <a href="#">Using the Merge documents action</a> .
Split document	See <a href="#">Using the Split document action</a> .

When an operation is performed on a PDF file, the file properties are stored in a dictionary variable. See [Using a dictionary variable for PDF properties](#).

## Using the Encrypt document action

Use the **Encrypt document** action to encrypt a PDF file.

To encrypt a PDF file, follow these steps:

- 1.** In the **Actions** palette, double-click or drag the **Encrypt document** action from the **PDF** package.
- 2.** In the **PDF path**, select one of the following options to specify the location of the PDF:

- **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.
3. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.
    - **User password:** Allow users to perform specific operations on the encrypted PDF file.
    - **Owner password:** Allow users to use a password to open the file.
  4. In the **User Permissions to Apply** field, select the following operations:
    - **Print:** Allows users to print the document.
    - **Modify:** Allows users to edit the document.
    - **Copy:** Allows users to copy the document.
    - **Form Fill:** Allows users to fill a form in the document.
    - **Document Assembly:** Allows users to combine multiple PDF files, attach files, and so on.
    - **Annotation:** Allows users to apply annotations in the document.
    - **Accessibility:** Allows users to read text from the document using accessibility devices.
  5. In the **Encryption level**, select the **RC4 40-bit**, **RC4 128-bit**, or **AES 128-bit** option to specify the encryption level.
  6. In the **Save encrypted PDF as** field, specify a name and location for the encrypted file. You must include the .pdf extension in the name of the encrypted file. For example, if the file name is `June_Quarter_report`, the .pdf extension is `June_Quarter_report.pdf`.
  7. Select the **Overwrite files with the same name** check box to overwrite existing files with the same name.
 

---

**Note:** If this option is not selected and the bot encounters a file with the same name at the specified location, the bot will fail.

---
  8. Optional: From the **Assign PDF properties to a dictionary variable** list, select a dictionary variable to hold the file properties. For more information, see [Using a dictionary variable for PDF properties](#).
  9. Click **Save**.

### Related tasks

[Using the Decrypt document action](#)

Use the **Decrypt document** action to decrypt a PDF file that is encrypted using the **Encrypt document** action.

### Using the Extract field action

Use the **Extract field** action to extract fields from a PDF and assign it to variables.

To extract fields from a PDF file, follow these steps:

1. In the **Actions** palette, double-click or drag the **Extract field** action from the **PDF** package.
2. In the **PDF path**, select one of the following options to specify the location of the PDF:
  - **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.

3. From the **File is protected** field, select **Yes** if the file is encrypted and provide the **User password** or **Owner password**.
4. Click **Open PDF viewer**.
5. In the **Select a PDF file** window, select a PDF file from Control Room file or Desktop file.
6. Optional: Enter the password.
7. Click **Load** to open the **PDF Viewer**.  
In the **PDF Viewer** window, the PDF is opened with all the structured fields highlighted in purple dotted rectangles.
8. Select the rectangular area of the field to be extracted and click **Add field** to add the field and its value under the **Extract fields** table.
9. Optional: You can add an unstructured field that are not highlighted in the PDF. Select the **Draw a region** option available at the top of the PDF viewer and draw a rectangle box around the required region.  
A red colored dotted rectangle is highlighted with an option **Add custom region**
10. Click **Add custom region** to view the captured coordinates in the **Custom region** window. Enter the **Key name** that can be used in the output variable.
11. Click **Close** to add the field in the **Extract fields** table.  
The list of extracted fields appear under the **Extract fields** table on the right panel of **PDF viewer** window.  
The extracted fields change to blue dotted rectangles in the PDF viewer. You can edit the extracted fields by selecting the blue rectangle around the field.  
Use the vertical ellipse button next to the extracted field in the **Extract fields** table to **Edit, Move** or **Delete** the field.
12. Click **Close** to close the PDF viewer .
13. From the **Save the output to a variable** field, choose either a dictionary variable or multiple variables to hold the field values.
14. Click **Save**.

## Using the Extract text action

Use the **Extract text** action to extract text from a PDF file and save it as a text file.

To extract text from a PDF file, follow these steps:

1. In the **Actions** palette, double-click or drag the **Extract text** action from the **PDF** package.
2. In the **PDF path**, select one of the following options to specify the location of the PDF:
  - **Control Room file**: Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile**: Enables you to select a PDF file that is available on your device.
  - **Variable**: Enables you to specify the file variable that contains the location of the PDF file.
3. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.
  - **User password**: Allow users to perform specific operations on the encrypted PDF file.
  - **Owner password**: Allow users to use a password to open the file.

4. In the **Text type** field, select one of the following options:
  - **Plain text:** Enables you to extract the text and copy it to a text file.  
It is similar to copying and pasting text from a PDF file to a text file.
  - **Structured text:** Enables you to preserve the original formatting of the extracted text from the PDF file.
5. In the **Page range** field, select one of the following options:
  - **All pages:** Enables you to save all the pages in the PDF file as an image.
  - **Pages:** Enables you to enter the page numbers of the pages that you want to save as an image.
6. In the **Export data to text file** field, specify a name and location for the text file.

---

**Note:** You must include the .txt extension in the name of the text file. For example, if the file name is `June_Quarter_report`, the .txt extension is `June_Quarter_report.txt`.

---

7. Select the **Overwrite files with the same name** check box to overwrite existing files with the same name.

---

**Note:** If this option is not selected and the bot encounters a file with the same name at the specified location, the bot will fail.

---

8. Optional: From the **Assign PDF properties to a dictionary variable** list, select a dictionary variable to hold the file properties.  
For more information, see [Using a dictionary variable for PDF properties](#).
9. Click **Save**.

## Using the Extract image action

Use the **Using Extract image** action to save a PDF file as an image.

To save a PDF file as an image, follow these steps:

1. In the **Actions** palette, double-click or drag the **Extract image** action from the **PDF** package.
2. In the **PDF path**, select one of the following options to specify the location of the PDF:
  - **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.
3. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.
  - **User password:** Allow users to perform specific operations on the encrypted PDF file.
  - **Owner password:** Allow users to use a password to open the file.
4. In the **Page range** field, select one of the following options:
  - **All pages:** Enables you to save all the pages in the PDF file as an image.
  - **Pages:** Enables you to enter the page numbers of the pages that you want to save as an image.
5. In the **Type of image to be converted to** list, select one of the following options to specify the format:
  - **TIFF:** If you selected this option, select an option from the **TIFF compression type** list.
  - **NONE**

- **LZE**
  - **RLE**
  - **CCITT Group 3**
  - **CCITT Group 4**
- **BMP**
  - **JPEG:** If you selected this option, in the **JPEG quality** field, enter a value (between 0 and 100) to specify the quality of the compressed image.
  - **GIF**
  - **PNG**
  - **WMF**
  - **EMF**
  - **EXIF**
6. In the **Folder path** field, specify the location.
  7. In the **File prefix** field, enter a value.  
The image files are suffixed with index numbers. For example, if you have specified `Report` as the **File prefix**, the name of the image files will be `Report_1`, `Report_2`, and so on.
  8. Select the **Overwrite files with the same name** check box to overwrite existing files with the same name.

---

**Note:** If this option is not selected and the bot encounters a file with the same name at the specified location, the bot will fail.

---

9. In the **X Resolution (dpi)** and **Y Resolution (dpi)** fields, specify the resolution.
10. In the **Image output** field, choose **Color** or **Grayscale** to specify the image output type:
  - a) In the **Color property** list, select an option.
    - **True color (32 bits)**
    - **True color (24 bits)**
    - **High color (16 bits)**
    - **56 color (8 bits)**
    - **16 color (4 bits)**
    - **2 color (1 bit, black/white)**

---

**Note:** This option is available only with the **Color** image output type. Select this option only if **RLE**, **CCITT Group 3**, or **CCITT Group 4** compression type is selected for the **TIFF** image format.

---

11. Optional: From the **Assign PDF properties to a dictionary variable** list, select a dictionary variable to hold the file properties.  
For more information, see [Using a dictionary variable for PDF properties](#).
12. Click **Save**.

## Using the Decrypt document action

Use the **Decrypt document** action to decrypt a PDF file that is encrypted using the **Encrypt document** action.

To decrypt an encrypted PDF file, follow these steps:

1. In the **Actions** palette, double-click or drag the **Decrypt document** action from the **PDF** package.
2. In the **PDF path**, select one of the following options to specify the location of the PDF:

- **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.
3. Optional: In the **User/Owner password** field, enter a password to restrict access to the decrypted PDF file.
  4. In the **Save the decrypted PDF file as** field, specify a name and location for the decrypted file. You must include the .pdf extension in the name of the decrypted file. For example, if the file name is `June_Quarter_report`, the .pdf extension is `June_Quarter_report.pdf`.
  5. Select the **Overwrite files with the same name** check box to overwrite existing files with the same name.

---

**Note:** If this option is not selected and the bot encounters a file with the same name at the specified location, the bot will fail.

---

6. Optional: From the **Assign PDF properties to a dictionary variable** list, select a dictionary variable to hold the file properties.  
For more information, see [Using a dictionary variable for PDF properties](#).
7. Click **Save**.

### Related tasks

[Using the Encrypt document action](#)

Use the **Encrypt document** action to encrypt a PDF file.

## Using the Get property action

Use the **Get property** action to obtain the properties of the PDF document.

1. In the **Actions** palette, double-click or drag the **Get property** action from the **PDF** package.
2. In the **PDF path**, select one of the following options to specify the location of the PDF:
  - **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.
3. From the **File is protected** field, select **Yes** if the file is encrypted and provide the **User password** or **Owner password**.
4. From the **Assign PDF properties to a dictionary variable** field, choose either a dictionary variable or multiple variables to hold the field values.  
To assign the output to a dictionary variable, map the PDF properties such as **File**, **Author**, **Title**, and **Subject** to the corresponding dictionary keys.
5. Click **Save**.

## Using the Merge documents action

Use the **Merge documents** action to merge multiple PDF files into a single PDF file.

1. In the **Actions** palette, double-click or drag the **Merge documents** action from the **PDF** package.
2. Click **Add PDF document** to provide details on the first PDF file.  
The **Add PDF document** window appears.
3. In the **PDF path**, select one of the following options to specify the location of the PDF:

- **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.
4. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.
- **User password:** Allow users to perform specific operations on the encrypted PDF file.
  - **Owner password:** Allow users to use a password to open the file.
5. In the **Page range** field, select one of the following options:
- **All pages:** Selects all the pages in the PDF file.
  - **Pages:** Enter the page numbers of the pages that you want to merge.

---

**Note:** If you entered 1-3, 5-7, 8, 10 or 10, 8, 5-7, 1-3 in 11.x, the output was pages 1,2,3,5,6,7,8,10. In Automation 360, if you enter the input as follows:

- In ascending order 1-3, 5-7, 8, 10, the output of the pages is 1,2,3,5,6,7,8,10
  - In descending order 10, 8, 5-7, 1-3, the output of pages is 10,8,5,6,7,1,2,3
- 

6. Click **Yes, Add**.
7. Repeat Steps 2 through 6 to provide details on additional PDF files.  
To modify the details of, or delete a PDF file, open the actions menu (the vertical ellipsis to the right of the file).
8. Place the files in the order that they should appear in the merged file.  
To move a file, open the actions menu. Then use the **Move up** or **Move down** options.
9. In the **Output file path** field, specify a name and location for the merged file.  
You must include the .pdf extension in the name of the decrypted file. For example, if the file name is June\_Quarter\_report, the .pdf extension is June\_Quarter\_report.pdf.
10. Select the **Overwrite files with the same name** check box to overwrite existing files with the same name.

---

**Note:** If this option is not selected and the bot encounters a file with the same name at the specified location, the bot will fail.

---

11. Click **Save**.

## Using the Split document action

Use the **Split document** action to split a PDF file into multiple files.

To split a PDF file into multiple files, follow these steps:

1. In the **Actions** palette, double-click or drag the **Split document** action from the **PDF** package.
2. In the **PDF path**, select one of the following options to specify the location of the PDF:
  - **Control Room file:** Enables you to select a PDF file that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select a PDF file that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the PDF file.
3. Optional: In the **User password** or **Owner password** field, enter a password to restrict access to the encrypted PDF file.

- **User password:** Allow users to perform specific operations on the encrypted PDF file.
  - **Owner password:** Allow users to use a password to open the file.
4. In the **Output file creation options**, select one of the following options to specify how to split the PDF file:
    - **Number of pages per extracted PDF:** Enables you to specify the number of pages each new file will contain. For example, you can enter 8 if you want each output file to contain only 8 pages.
    - **Single file with selected pages:** Enables you to create a single output file that contains the pages you have specified from the original file.
    - **Blank page as a separator:** Creates a new output file whenever a blank page is encountered in the original PDF file.  
 PDF split separates a blank page from pages with scanned images.
    - **Bookmark level per file:** Enables you to split the PDF file according to the bookmark level available in the file. For example, if a file contains three bookmark levels, you can split the PDF file based on these three levels.  
 If you selected this option, specify the bookmark level in the **Bookmark Level** field.
  5. In the **Folder path** field, specify the location.
  6. In the **File prefix** field, enter a value.  
 The image files are suffixed with index numbers. For example, if you have specified `Report` as the **File prefix**, the name of the image files will be `Report_1`, `Report_2`, and so on.
  7. Select the **Overwrite files with the same name** check box to overwrite existing files with the same name.  


---

**Note:** If this option is not selected and the bot encounters a file with the same name at the specified location, the bot will fail.

---
  8. Optional: From the **Assign PDF properties to a dictionary variable** list, select a dictionary variable to hold the file properties.  
 For more information, see [Using a dictionary variable for PDF properties](#).
  9. Click **Save**.

## Using a dictionary variable for PDF properties

When you automate a PDF-related task, RPA Workspace retrieves various properties of the file and stores the values of these properties in a dictionary variable.

RPA Workspace retrieves the PDF file name and extension, title, subject, and author. The file properties are stored in a dictionary variable within the following keys:

- pdfTitle
- pdfFilename
- pdfSubject
- pdfAuthor

The system automatically associates the properties of a PDF with the appropriate dictionary keys.

For example, if you create a dictionary variable `Test` and want to log the file name and author, you must enter `Test{pdfFilename}` and `Test{pdfAuthor}` in the appropriate fields.

## PGP package

Use the **PGP** (Pretty Good Privacy) package to automatically encrypt and decrypt files for security.

The PGP package supports two types of encryption, symmetric (single key) and asymmetric (pair of keys) :

- **PGP symmetric** : Requires a single key to encrypt and decrypt files.
- **PGP asymmetric**: Requires PGP public and private key to encrypt and decrypt files.

---

**Note:** The system outputs an error when the proper file extension is not present in the path.

- **Public key:** File name specified for Public Key is not valid.
  - **Private key:** File name specified for Private Key is not valid.
- 

## Actions in the PGP package

The **PGP** package includes the following actions:

Action	Description
Create keys	<p>Creates a pair of public and private encryption keys.</p> <ul style="list-style-type: none"> <li>• In the <b>Location to save public key file</b> field, specify the path to the text file where to save the public key.</li> <li>• In the <b>Location to save private key file</b> field, specify the path to the text file where to save the private key.</li> <li>• <b>Optional:</b> In the <b>Password to protect private key file</b> field, select a credential variable or enter a value.</li> <li>• <b>Optional:</b> Select the <b>Overwrite Files</b> check box to replace files with the same name.</li> </ul>
Decrypt files	Decrypts encrypted files. See <a href="#">Using the Decrypt files action</a>
Encrypt files	Encrypts files to enable users to send them over the internet securely. See <a href="#">Using the Encrypt files action</a>

## Using the Decrypt files action

Use the **Decrypt files** action to retrieve the contents of encrypted files and folders.

To decrypt a file or folder, do the following steps:

1. Double-click or drag the **Decrypt** action from the PGP package.
2. Select either the **Passphrase** or **Public key file** encryption type.
  - If you have selected **Passphrase**, enter the value or select a credential variable.
  - If you have selected **Private key file**, provide the private key file path.
 

**Optional:** In the **Password to protect private key file** field, select a credential variable or enter a value.
3. In the **Source folder/file(s)** field, specify the folders or files to decrypt.
 

This field supports wildcard characters in the file name and extension. Use an asterisk (\*) to substitute for one or more unknown alphanumeric characters or symbols.
4. In the **Destination folder/file(s)** field, specify the location where to save the decrypted folders and files.
 

This field supports wildcard characters in the file name and extension. Use an asterisk (\*) to substitute for one or more unknown alphanumeric characters or symbols.
5. Select the **Overwrite Files** option to replace files with the same name.

6. Select the **Remove file extension** option and specify the extension name.
7. Click **Save**.

## Using the Encrypt files action

Use the **Encrypt files** action to prepare files and folders to be shared securely.

To encrypt the files or folder using a public key, create a public-private key pair using the **Create keys** action.

To encrypt a file or folder, do the following steps:

1. Double-click or drag the **Encrypt** action from the PGP package.
2. Select either the **Passphrase** or **Public key file** encryption type.
  - If you have selected **Passphrase**, enter the value or select a credential variable.
  - If you have selected **Public key file**, provide the public key file path.
3. Select the **Encryption algorithm**.  
Choose from:
  - AES128
  - AES192
  - AES256
  - Blowfish
  - CAST5
  - Idea
  - TripleDES
  - TwoFish256
4. In the **Source folder/file(s)** field, specify the folders or files to encrypt.  
This field supports wildcard characters in the file name and extension. Use an asterisk (\*) to substitute for one or more unknown alphanumeric characters or symbols.  
For example:
  - Enter `C:\PGP\encrypt*.csv` to select the .csv files that start with the word encrypt.
  - Enter `C:\PGP\*encrypt*.*` to select files of any extension that contain the word encrypt.
5. In the **Destination folder/file(s)** field, specify the location where to save the encrypted folders and files.  
This field supports wildcard characters in the file name and extension. Use an asterisk (\*) to substitute for one or more unknown alphanumeric characters or symbols.
6. Enter a value to append to the extension of the destination file.
7. Select the **Overwrite Files** check box to replace files with the same name.
8. Select the **Compression type**.  
Choose from:
  - None
  - zip
  - bzip2
  - zlib
9. Select the **Armor data (text output)** check box to enable ASCII Armor output.
10. Click **Save**.

## Play Sound package

The Play Sound package contains actions that enable you to play a beep sound and media file before or after an action is executed in a bot.

The Play Sound package includes the following actions:

Action	Description
Play beep	Plays a beep sound before or after an action is executed.
Play media file	Plays an audio file before or after an action is executed.  <b>Note:</b> Only .wav and .mp3 files are supported and do not require any media player installed on the device.  Select any of the following tabs to specify the location of the media file: <ul style="list-style-type: none"> <li>• <b>Control Room file:</b> Use a file that is available on the Control Room.</li> <li>• <b>Desktop file:</b> Use a file that is available on a device.</li> <li>• <b>Variable:</b> Use a file variable to specify the file location.</li> </ul>

## Printer package

Use the actions in the Printer package to automate retrieving and setting the default printer.

### Actions in the Printer package

The Printer package includes the following actions:

Action	Description
Get Default	Retrieves the default printer and assigns the value to a string variable.
Set Default	Sets the default printer.

## Process package

The **Process** package contains a request action that enables the Control Room user to use this action and configure their bots.

### Before you start

---

**Note:** The **Process** package is now renamed to the **AARI web** package in Enterprise A2019.18 with the **Create a Request** action and additional new actions. See [AARI web package](#).

---

Ensure you have met one of the following conditions in order to run this package:

#### Condition 1

- Access to a process in an assigned team.
- Access to AARI User license.

- A system-created **AAE\_Robotic\_Interface User** role for the AARI user.
- Access to a Bot Runner license (Attended or Unattended) or Bot Creator license.
- A user-created role with the **View My Bots** and **Run My Bots** permissions.

## Condition 2

## Actions in the Process package

The **Process** package includes the following action:

Action	Description
Create a Request	<p>Creates a request.</p> <ul style="list-style-type: none"> <li>• In the <b>Select Process</b> field, select or upload your process.</li> <li>• Specify your variable in the <b>Dictionary</b> or <b>Variable</b> field. <ul style="list-style-type: none"> <li>• <b>Dictionary:</b> Input your variable information in the <b>Type</b>, <b>Key</b>, and <b>Value</b> fields. In the <b>Type</b> field, you can choose between <b>Any</b>, <b>String</b>, <b>Number</b>, <b>Datetime</b>, or <b>Boolean</b>.</li> <li>• <b>Optional:</b> In the <b>Add</b> field, add more dictionary variables.</li> <li>• <b>Variable:</b> Enter your custom variable.</li> </ul> </li> <li>• <b>Optional:</b> In the <b>Assign the Request ID to</b> field, assign a variable to store as an output. The output is stored as an ID value.</li> </ul>

## Prompt package

Use the **Prompt** package to accept an input value, a yes/no response, or to open a file or folder.

## Actions in the Prompt package

The **Prompt** package includes the following actions:

Action	Description
For file	<p>Prompts the user to input a value.</p> <ul style="list-style-type: none"> <li>• In the <b>Prompt window caption</b> field, enter a window caption.</li> <li>• In the <b>Prompt message</b> field, enter a message.</li> <li>• In the <b>Assign the value to a variable</b> field, specify a list variable.</li> </ul>

Action	Description
For folder	<p>Prompts the user to choose a folder.</p> <ul style="list-style-type: none"> <li>In the <b>Prompt window caption</b> field, enter a window caption.</li> <li>In the <b>Prompt message</b> field, enter a message.</li> <li>In the <b>Assign the value to a variable</b> field, specify a variable.</li> </ul>
For value	<p>Prompts the user to enter a value.</p> <ul style="list-style-type: none"> <li>In the <b>Prompt window caption</b> field, enter a window caption.</li> <li>In the <b>Prompt message</b> field, enter a message.</li> <li>In the <b>Assign the value to a variable</b> field, specify a variable.</li> </ul>
For yes/no	<p>Prompts the user to choose a Yes/No response.</p> <ul style="list-style-type: none"> <li>In the <b>Prompt window caption</b> field, enter a window caption.</li> <li>In the <b>Prompt message</b> field, enter a message.</li> <li>In the <b>Assign the value to a variable</b> field, specify a variable.</li> </ul>

Watch the following video on how to use the Prompt actions:

### Related reference

#### [Message box package](#)

Use the **Message box** action from the **Message box** package to insert a message box that shows a message when the task runs. For example, you can insert a **Message Box** action to follow a web form so that the action displays the message: `Web Form Filled and Complete`.

## Python Script package

The **Python Script** package contains actions that enable Python Script functions in a task.

### Before you start

Ensure the following requirements are met before using the **Python Script** package:

- The appropriate version of Python is installed on the device on which you want to execute the script.

---

**Note:** Python versions 2.x and 3.x are supported.

---

- The "PATH" environment variable is updated to the path of the Python folder.

To verify if the Python environment variable is set correctly, enter `python` in the command prompt. If it returns the Python version that is installed, the path environment is set up correctly.

Perform the following actions within the Python Script package as part of using the set of available actions:

1. Open a Python Script file, or manually enter the script you want to run using the **Open** action. You must associate the details of the file or script you want to run with a session name.

2. Run the script using the **Execute function** or the **Execute script** action.
  - If you uploaded a file containing the script, use the **Execute script** action.
  - If you manually input the script, use the **Execute function** action.

You must use the same Python Script session name established in the **Open** action.

3. Close the Python Script session after running the script.

---

**Note:** When you run a bot that contains Python Script actions, the script runs in the background.

To review the bot launcher logs, navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\<current month>\Bot_Launcher-<today's date>.log.zip`. Each zipped folder contains a file with data on the code execution, which is useful for debugging.

---

## Actions in the Python Script package

The **Python Script** package includes the following actions:

---

**Note:** The **Open** action must be the first action to use the Python Script in a task. These actions can run a Python Script on Windows, Linux, and UNIX-based devices.

---

Action	Description
Close	<p>Closes the session.</p> <p>Specify the same session name from the <b>Open</b> action.</p> <hr/> <p><b>Important:</b> It is mandatory to close the session after the script is executed.</p> <hr/>
Execute function	<p>Executes a function within the Python Script.</p> <ul style="list-style-type: none"> <li>• In the <b>Python session</b> field, specify a session name. Use the same session name from the <b>Open</b> action.</li> <li>• <b>Optional:</b> Specify the function name to run and the arguments to pass to the function.</li> </ul> <p>This field supports Boolean, dictionary, list, number, or string variables.</p> <hr/> <p><b>Note:</b> The interface allows you to select only one argument. Use a list variable to concatenate multiple arguments into one variable.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Optional:</b> In the <b>Assign the output to variable</b> field, specify the string variable.</li> </ul> <p>For an example, see <a href="#">Example of using Python script to join a list</a>.</p>

Action	Description
Execute script	<p>Executes a script within the Python Script.</p> <ul style="list-style-type: none"> <li>In the <b>Python session</b> field, specify a session name. Use the same session name from the <b>Open</b> action.</li> <li><b>Optional:</b> In the <b>Assign the output to variable</b> field, specify the string variable.</li> </ul> <p>If the bot executes the script successfully, this action returns the string <code>True</code>. Otherwise an error message appears.</p> <p>For an example, see <a href="#">Create a PDF using Python script</a>.</p>
Open	<p>Opens a Python Script file.</p> <ul style="list-style-type: none"> <li>In the <b>Python session</b> field, specify a session name. Use this same session name for other <b>Python Script</b> actions.</li> <li>In the <b>Python</b> field, choose one of the following options: <ul style="list-style-type: none"> <li>In the <b>Import existing file</b> option, select an existing Python Script file.</li> </ul> <hr/> <p><b>Note:</b> If you are uploading a script from a file on your desktop, the file and any dependencies must be in a standalone folder. When you select a file for upload, all files and folders at the same folder level are uploaded.</p> <hr/> <li>In the <b>Manual input</b> option, enter the Python Script.</li> </li></ul> <ul style="list-style-type: none"> <li>In the <b>Python runtime version</b> field, select <b>2</b> or <b>3</b> to specify the runtime version.</li> </ul> <hr/> <p><b>Note:</b> Select the runtime version based on the version of Python installed on the device.</p> <hr/>

## More resources

- Free A2019 bots that use Python from Bot Store
  - [Python Excel demo](#)
  - [Speech to text using Python](#)
  - [Run Python script](#)
- Developer content on automating with Python: [Automate with Python integration](#)
- Training course: [Training - Write inline scripts in a bot \(A-People login required\)](#)

## Create a PDF using Python script

Build a bot that runs Python script from a file and generates a PDF.

- To run Python script from Automation 360, you must already have the latest version of Python 3.x installed on your device.

- This example uses the FPDF library to generate the PDF. Therefore, install it before you start building this bot by copying and pasting the following line in the Windows command prompt:

```
pip install fpdf
```

See [FPDF project page](#).

1. Create a file in a standalone folder to hold the following Python script:  
Insert your device username in the angle brackets.

```
from fpdf import FPDF
pdf = FPDF()
pdf.add_page()
pdf.set_font("Arial", size=12)
pdf.cell(200, 10, txt="Go Be Great!", ln=1, align="C")
pdf.output("C:/Users/<yourusername>/Desktop/sample_demo.pdf")
```

**Note:** If you are uploading a script from a file on your desktop, the file and any dependencies must be in a standalone folder. When you select a file for upload, all files and folders at the same folder level are uploaded.

2. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.
3. Provide the script with a **Python Script > Open** action:
  - a) Double-click or drag the **Python Script > Open**.
  - b) Select the **Import existing file** option.
  - c) Click **Browse** to select the .py file you created in Step 1.
4. Use a **Python Script > Execute script** action to tell the bot to run the script:
  - a) Double-click or drag **Python Script > Execute script**.
5. Close the script execution session with a **Python Script > Close** action:
  - a) Double-click or drag **Python Script > Close**.
  - b) Click **Save**.

6. Click the **Run** icon.

The bot creates a PDF on the desktop with the text `Go Be Great!`.

To review the bot launcher logs, navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\<current month>\Bot_Launcher-<today's date>.log.zip`. Each zipped folder contains a file with data on the code execution, which is useful for debugging.

If the bot does not create a file, change the last line in the Python script:

```
pdf.output(r"C:/Users/<yourusername>/Desktop/sample_demo.pdf")
```

## Recorder package

Use the **Capture** action from the Recorder package to capture an interaction with a user interface (UI) object such as a text box, button, table, menu, radio button, combo box, check box, list view, link, tree, and page tab.

The **Capture** action enables you to add a single interaction when building your bot (such as if you missed a step when recording a process). See [Using the Capture action](#). For a common use case, see [Example of entering data into a web form from a worksheet](#).

To record a process consisting of multiple steps, see [Record a task with the Universal Recorder](#). To learn more about Universal Recorder capabilities, see [Universal Recorder for object-based automation](#).

For a list of the applications and browsers in which you can use this action, see [Universal Recorder supported applications and browsers](#).

---

**Note:** If you encounter an error when running a bot that captures an object from Internet Explorer and the error message is about Google Chrome, see [IE known limitation \(A-People login required\)](#).

---

## Object properties

When you select an object to capture, the Universal Recorder collects data on the object's properties in order to identify the object during run time. You can do the following with the object properties:

- Verify that the captured object properties match your intended object.  
For example, when capturing a table from a website, ensure the **Control Type** and **HTML Tag** values are **TABLE**.
- Retrieve a property value.  
For example, to retrieve the text of a link, use the **Get property** action and enter `HTML InnerText` in the **Property name** field.
- Specify the properties to search for. Mark the only the properties that will always resolve to true.

## Actions performed on captured objects

After capturing the object, specify the action for the bot to do to the object at run time. For example, when you capture a hyperlink, you can select to click the link or to retrieve the link text. To see table of all objects and possible actions, see [Actions performed on objects captured with Universal Recorder](#).

## Background processing

Background processing enables an automation that involves interacting with an application in the foreground (such as mouse clicks) to run in the background. We recommend that you use this option to increase the visibility of the target object and improve bot accuracy. The following actions support background processing:

- Click
- Set Text
- Get Text

## Secure Recording

When secure recording mode is enabled, bots do not capture object images or values. This ensures that sensitive data is not stored in the bots.

When you record a task in secure recording mode, the **Preview** window temporarily shows the captured area. This image is deleted after you navigate away from the action editor window.

A user with admin privileges must enable this setting. See [Settings](#).

## Proxy support

If your device is configured with a proxy, all outbound requests from this package are routed through the proxy server. See [Connect Bot agent to a device with a proxy](#).

---

**Example:** [Example of extracting data from a web table](#)

---

## Actions performed on objects captured with Universal Recorder

After capturing the object, specify the action for the bot to do to the object at runtime. For example, if you capture a hyperlink, you can select an action to click the link or to retrieve the link text. Refer to the table below for the objects and their possible actions.

**Note:** After you have captured an object and open the **Action** drop-down list, the list might offer actions for an object that are not supported. Only use the actions for an object that are listed in the table below.

Object	Actions
Button	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Click</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Checkbox	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get status:</b> retrieves whether the check box is selected. Returns checked or unchecked.</li> <li>• <b>Check</b></li> <li>• <b>Uncheck</b></li> <li>• <b>Set focus</b></li> <li>• <b>Toggle:</b> switches the check box to the opposite status. For example, if the check box is checked, use the <b>Toggle</b> action to clear it.</li> <li>• <b>Left click:</b> use this action if the <b>Toggle</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
Client	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get all children names</b></li> <li>• <b>Get all children values</b></li> <li>• <b>Set text:</b> enters text into the UI object. It supports credentials. <i>Credentials and credential variables in the Bot editor</i></li> <li>• <b>Click</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
ComboBox (appears as a drop-down list)	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get total items:</b> retrieves the number of items in the box.</li> <li>• <b>Get selected index:</b> retrieves the item's position in the menu.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get selected item key:</b> retrieves the key of the selected item.</li> <li>• <b>Get selected text:</b> retrieves the data from the selected item.</li> <li>• <b>Select item by index:</b> selects the item that is located at the specified index.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Select item by text</b> selects the item that matches the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Assign value</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set focus</b></li> <li>• <b>Expand</b></li> <li>• <b>Click</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
GridView (SAP only)	<ul style="list-style-type: none"> <li>• <b>Click on cell by index</b></li> </ul> <hr/> <p><b>Note:</b> Index count starts at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Double click current cell</b></li> <li>• <b>Get total rows:</b> retrieves the number of rows that contain values.</li> <li>• <b>Get total columns:</b> retrieves the number of columns that contain values.</li> <li>• <b>Get cell text by index:</b> retrieves the data in the specified cell located at the row and column index.</li> </ul> <hr/> <p><b>Note:</b> Row and column index counts start at 1. For example, to retrieve the data in cell A2, enter 1 in the <b>Row</b> field and 2 in the <b>Column</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get cell index by text:</b> retrieves the index of the cell containing the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Cell Text</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get table:</b> retrieves the table data and saves it to a Table variable. For more information, see <a href="#">Example of extracting data from a web table</a>.</li> <li>• <b>Select all</b></li> <li>• <b>Set cell by index:</b> enters text into the cell located at the row and column index.</li> </ul> <hr/> <p><b>Note:</b> Row and column index counts start at 1. For example, to enter text into cell A2, enter 1 in the <b>Row</b> field and 2 in the <b>Column</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set cell by text:</b> enters text into the cell containing the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Find Text</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set current cell</b></li> <li>• <b>Set current row</b></li> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Label	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
Link	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Click</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
ListView	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get total items:</b> retrieves the number of items in the list.</li> <li>• <b>Get selected index:</b> retrieves the item's position in the menu.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get selected text:</b> retrieves the data from the selected item.</li> <li>• <b>Select item by index:</b> selects the item that is located at the specified index.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Select item by text</b> selects the item that matches the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Assign value</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Click</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Main window	<ul style="list-style-type: none"> <li>• <b>Get focus control id:</b> retrieves the ID of the control that is in focus.</li> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Set focus</b></li> <li>• <b>Send key</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
Menu	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get total items:</b> retrieves the number of items in the menu.</li> <li>• <b>Get selected index:</b> retrieves the item's position in the menu.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get selected text:</b> retrieves the data from the selected item.</li> <li>• <b>Select item by index:</b> selects the item that is located at the specified index.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Select item by text</b> selects the item that matches the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Assign value</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Page Tab	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get total items:</b> retrieves the number of items in the tab.</li> <li>• <b>Get selected index:</b> retrieves the item's position in the menu.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get selected text:</b> retrieves the data from the selected item.</li> <li>• <b>Select item by index:</b> selects the item that is located at the specified index.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Select item by text</b> selects the item that matches the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Assign value</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
RadioButton	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get status:</b> retrieves whether the radio button is selected. Returns selected or deselected.</li> <li>• <b>Select</b></li> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Shell	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Slider	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Set position</b></li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Tab	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Scroll left</b></li> <li>• <b>Select</b></li> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
Table	<ul style="list-style-type: none"> <li>• <b>Deselect all</b></li> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get cell text by index:</b> retrieves the data in the specified cell located at the row and column index.</li> </ul> <hr/> <p><b>Note:</b> Row and column index counts start at 1. For example, to retrieve the data in cell A2, enter 1 in the <b>Row</b> field and 2 in the <b>Column</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get cell index by text:</b> retrieves the index of the cell containing the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Cell Text</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get table:</b> retrieves the table data and saves it to a Table variable. For more information, see <a href="#">Example of extracting data from a web table</a>.</li> <li>• <b>Get total rows:</b> retrieves the number of rows that contain values.</li> <li>• <b>Get total columns:</b> retrieves the number of columns that contain values.</li> <li>• <b>Select row</b></li> <li>• <b>Select all</b></li> <li>• <b>Set cell by index:</b> enters text into the cell located at the row and column index.</li> </ul> <hr/> <p><b>Note:</b> Row and column index counts start at 1. For example, to enter text into cell A2, enter 1 in the <b>Row</b> field and 2 in the <b>Column</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set cell by text:</b> enters text into the cell containing the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Find Text</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

Object	Actions
TextBox	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Set focus</b></li> <li>• <b>Set text:</b> enters text into the UI object. It supports credentials. <i>Credentials and credential variables in the Bot editor</i></li> <li>• <b>Append text:</b> adds text to the end of existing text in the field, instead of overwriting it.</li> <li>• <b>Click</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Toolbar	<ul style="list-style-type: none"> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>
Tree (Control is displayed as a ListView)	<ul style="list-style-type: none"> <li>• <b>Expand node:</b> expands the current node to down to the next level of nodes.</li> <li>• <b>Get property:</b> retrieves the value of the specified object property (such as the link text) and optionally saves it to a variable. For more information, see the Object properties section.</li> <li>• <b>Get total items:</b> retrieves the number of items in the tree.</li> <li>• <b>Get selected index:</b> retrieves the item's position in the menu.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get selected text:</b> retrieves the data from the selected item.</li> <li>• <b>Select item by index:</b> selects the item that is located at the specified index.</li> </ul> <hr/> <p><b>Note:</b> Item index counts start at 1.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Select item by text</b> selects the item that matches the specified text.</li> </ul> <hr/> <p><b>Note:</b> The <b>Assign value</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Set focus</b></li> <li>• <b>Left click:</b> use this action if the <b>Click</b> action does not work during Runtime.</li> <li>• <b>Right click</b></li> <li>• <b>Double click</b></li> </ul>

## Using the Capture action

Use the **Capture** action to capture a single interaction (click, keystroke, or mouse movement) with an object control including a text box, button, table, menu, radio button, combo box, check box, list view, link, tree, or page tab.

- To use the Recorder, you must already have done the following:
  - [Install Bot agent and register device](#)
  - [Set user device credentials](#)
- Configure device display and font scale to 100%.

If you are using Recorder package version 2.0.6-20200626-193519 or later, you can record tasks in Google Chrome, Internet Explorer, Java, Microsoft Active Accessibility, and Microsoft UI automation applications on a computer that has display scale configured to 100%, 125%, or 150%.

- If you are automating a task using a browser, configure the zoom level to 100%.

If you are using Recorder package version 2.0.6-20200626-193519 or later, you can record tasks in a Google Chrome browser that does not have a zoom level setting of 100%.

- If you are automating a task using a Google Chrome browser, ensure that the Automation Anywhere plug-in that corresponds with the Automation 360 build version is enabled.

### [Browser requirements](#)

Considerations when recording a task:

- Use clicks when possible rather than shortcut keys.

When you click an object using the Recorder, it retrieves the object's properties that enable the bot to identify the object at runtime. Keyboard shortcuts are less reliable, so use them when it is not possible to automate the task by a clicking an object.

- If you are automating a task using a browser, do not use autofill to enter values into fields.
- Record the task at low speed.
- Avoid dragging windows during the recording process.
- Avoid clicking on applications that are not part of the process you are recording and automating.
- When Internet Explorer is used, the action waits until the browser is completely rendered and is in a ready state before executing the action.

To record a single interaction with an object control, follow these steps:

- Double-click or drag **Recorder** > **Capture**.
- Specify the window in which to capture an object.

Choose from the **Application**, **Browser**, or **Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows. This option shows a list of all the application and browser windows that are open on the Bot Creator device.
<b>Browser</b>	Select from a list of Google Chrome tabs that are currently open on the Bot Creator device.  <b>Note:</b> Currently, this option only supports Google Chrome tabs. For all other browsers, use the <b>Application</b> option.

Option	Description
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.

3. Optional: Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value.

For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad)` for all the window title names starting with `((\w*)-Notepad)`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

---

**Note:** During runtime, verify that the TaskBot identifies the correct window. If it does not, do the following:

- a. Open the application or browser window.
  - b. Drag a **Window > Get active window title** action above the **Recorder > Capture** action.
  - c. Insert a string variable into the **Assign the window title to variable** field.
  - d. Drag a **Window > Set title** action below the **Window > Get active window title** action.
  - e. In the **Window** field, insert the window variable generated by the **Recorder > Capture** action.
  - f. In the **New window title** field, insert the string variable from the **Get active window title** action.
  - g. Click **Save**.
- 
4. Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

5. Click **Capture object**.

The selected window appears.

6. Click the object control, for example, a button, form field, or a table.

A box highlights the control when you mouse over it.

---

**Note:** If the box does not appear and you are capturing in the Google Chrome browser, verify that you have enabled the Automation Anywhere Google Chrome extension. See [Google Chrome browser extension requirements](#).

---

**7. Review the **Object properties** table.**

The bot uses the selected properties to identify the object control at runtime.

a) Verify that the **Control Type** matches your intended object.

For example, when capturing a table from a website, ensure the **Control Type** and **HTML Tag** values are **TABLE**.

If the **Control Type** does not match your intended object, recapture the object control.

## b) Select and assign values to the object properties that you want to include in the object search.

For a more reliable bot, we recommend that you select only the properties that have static values (such as **Name**, **Class**, **Type**, **HTML ID**, and **DOMXPath**), and deselect the properties that have dynamic values (such as **HTML Href**, **Path** or **Value**), which are subject to change and cause bot errors.

You can use the wild card character (\*) and variables in object property values to re-use the same action to capture different objects in different scenarios.

**8. Select the **Action** from the drop-down list.**

For a full list of possible actions by object, see [Actions performed on objects captured with Universal Recorder](#).

- If you record a click and keystrokes in a text box with a **Control Type** of `PASSWORD_TEXT`, the **Recorder** does not capture the keystrokes entered into the field. Instead, the action selects the **Set text** option and offers options to securely input the password. We recommend that you store the password in the Credential Vault and insert it into the action as a credential. [Credentials and credential variables in the Bot editor](#)

If you navigate to the text box using the TAB keystroke instead of a click in an MSAA or SAP application, the **Recorder** is able to identify fields with a **Control Type** of `PASSWORD_TEXT`.

- If the selected **Action** supports background processing, a **Run in the background** option appears. [Background processing](#)

**9. Optional: Enter a value in the **Wait for control** field to specify the number of seconds the bot must wait for the object control to appear on the application window.**

We recommend setting a delay time when using the Set text action to enter keystrokes into a text field.

**10. Optional: Assign the output to a variable.**

The Control Room suggests a descriptive default variable name based on the action you selected in step 8. For example, if you selected **Get property**, the suggested output variable is `PropertyValue`. If you create several output variables, subsequent variable names are appended with an "-1" to avoid duplication.

**11. Click **Save**.**

The captured images are not added as dependencies and will not be displayed in the dependencies list when you check in your bot.

**Link an object to a supporting anchor**


---

**Note:** You can use object anchoring in MSAA, UI Automation, or Java applications.

---

At runtime, if the bot cannot reliably identify an object, link it to a nearby object (such as a link or button) that is easier for the bot to find:

1. Open the **Capture** action.
2. Click the **Anchor** tab.

**3. Click Capture anchor.**

The browser or application window activates with the main object highlighted (the object that you previously captured). A dialog box appears, verifying whether the action has correctly identified the main object.

**4. If the correct object is highlighted, click Yes, Select anchor.**

Otherwise, click **No, I need to correct it** to select the correct object.

**5. Select a nearby object to the target object that is easier for the bot to find.**

The object is highlighted with an anchor icon on the right of the object.

**6. Click Save.**

Watch the following video on how to use the **Capture** action:

## REST Web Service package

Use the actions in the REST Web Service package as methods (DELETE, GET, PATCH, POST, or PUT) to send requests to and receive responses from an API.

### Working with REST Web Service actions

Provide the following information to send a REST request and receive a response. Not all parameters are required for all methods.

- **URI:** A unique address for an API resource.
- **Authentication Mode:** There are three supported authentication modes:
  - **Basic:** Text strings can be used for basic authentication.
  - **Logged-in AD User:** Active Directory (AD) users that are authorized to access the related API are authenticated through AD. No credentials are required in the request.
  - **Windows NT LAN Manager (NTLM) Authentication (AD User):** A challenge/response authentication method that allows clients to provide their user name and password as encrypted credentials or plain text. We recommend that you use credentials that are stored in the Automation Anywhere Credential Vault.
- **Header:** Not all methods require a header. Headers represent the metadata associated with the request.

---

**Note:** To use an API key in your request, enter `api_key` in the header **Name** field, and the key value in the **Value** field.

---

- **Capture failure response:** Select the check box to capture the failure response except for the `Success/Ok` response. The failure response details are captured in the response body.
- **Content type:** When a header contains a content type, it defines the content negotiation between the client and the server. REST Web Service actions support the following content types:
  - `application/json`
  - `application/xml`
  - `text/plain`
  - `text/html`
  - `text/xml`

- **Output variable:** The response output is captured in a dictionary variable. A dictionary variable is a key-value pair. Use the response header name as key to return the header value, or "Body" as the key to return the response body.

---

**Note:** The response key with its value is available in the dictionary variable to display the response status of the REST API.

---

To obtain a list of the header names for the API resource, perform these steps:

1. Insert a Loop action after the REST Web Service action.
2. Select the **For each key in the dictionary** iterator.
3. In the **Dictionary variable** field, select the variable that holds the REST Web Service action output.
4. Assign the value of each key to `$prompt-assignment$`.
5. Insert a Log To File action.
6. Provide the file path to a text file to hold the list of header names.
7. Insert `$prompt-assignment$` in the **Enter text to log** field.
8. Select the **Overwrite existing file** option.
9. Click **Save**.

When you run the bot, it prints the header names from the API resource to the selected file.

## Passing values securely

You can securely pass values from the Credential Vault to the web service by specifying the locker, credential, and attribute in the following supported action fields:

- URI
- Custom headers
- Body: For the `application/x-www-form-urlencoded` content type, click **Add parameter** to select the value from the Credential Vault.

For all other content types, select the **Select credential as parameters** option and click **Pick**.

## Actions in the REST Web Service package

Action	Description
Delete method	Removes the resource that is identified by the URI.

Action	Description
Get method	Retrieves information identified by parameters included in the URI. There is no <b>Content type</b> for the GET method because all the parameters are passed as part of the URI.  Limitations and characteristics of the <b>GET</b> method include the following: <ul style="list-style-type: none"> <li>• URI length is limited to 2048 characters.</li> <li>• All parameters are passed in the URI.</li> <li>• The <b>GET</b> method exposes data that is in the URI, making it less secure than the <b>POST</b> method.</li> <li>• <b>GET</b> does not change any data, making it safe for all users regardless of authorization.</li> </ul>
Patch method	Modifies the resource that is identified by the URI.
Post method	Creates a new resource in the URI. <ul style="list-style-type: none"> <li>• Parameters are passed in request body.</li> <li>• There is no limit on length for a request body.</li> </ul>
Put method	Updates or replaces a resource based on parameters passed in the URI or body.

## Proxy support

If your device is configured with a proxy, all outbound requests from this package are routed through the proxy server. See [Connect Bot agent to a device with a proxy](#).

### Related tasks

[Example of building a bot that uses credential variables](#)

Securely pass values to a bot using credential variables to automate the process of logging in to a bank website.

### Related reference

[Credentials and credential variables in the Bot editor](#)

Use credentials when building bots to pass sensitive information such as passwords and account numbers. Using credentials separates the sensitive information from the bots and Bot Runners, which reduces the risk of data spillage or unauthorized user access.

## Example of using REST Web Service actions

Use the **Get method**, **Post method**, and **Put method** actions from the REST Web Service package to send requests to and receive responses from a REST API. In this example, you retrieve a list of all the available inventory, place an order for an item, and then update the item status to "sold".

This example uses endpoints from the Swagger Petstore sample API to demonstrate how to use the actions to send requests and retrieve the response body.

1. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.

To change where your bot is stored, click **Choose** and follow the prompts.

- e) Click **Create and edit**.
2. Use the **Get method** action to retrieve a list of all the available pets.
  - a) Double-click or drag the **REST Web Services > Get method** action.
  - b) Enter the following URI:

```
https://petstore.swagger.io/v2/pet/findByStatus?status=available
```
  - c) Provide authorization details in the **Custom headers** table.
    1. In the **Name** column, enter `api_key`.
    2. In the **Value** column, enter `special-key`.
  - d) Create the variable `dOutput` in the **Assign the output to a variable** field.
3. Insert a **Log to file** action to see the response body.
  - a) Double-click or drag the **Log to file** action.
  - b) Provide the file path to a text file.
  - c) In the **Enter text to log** field, enter `$Output{Body}$`.

4. Click **Save** and then click **Run**.

The bot retrieves the response body and saves it to the text file.

5. Disable the **Log to file** action.

6. Use the **Post method** action to place an order for a pet.

- a) Double-click or drag the **REST Web Services > Post method** action.
- b) Enter the following URI:

```
https://petstore.swagger.io/v2/store/order
```

- c) Provide authorization details in the **Custom headers** table.
  1. In the **Name** column, enter `api_key`.
  2. In the **Value** column, enter `special-key`.
- d) Open the log file and copy the Pet ID of the first entry.
- e) Copy and paste the following into the **Custom parameters** field, replacing the text in the angle brackets with the value that you copied from the file:

```
{
  "petId": <PetID>,
  "quantity": 1,
  "shipDate": "2020-06-10T17:32:54.219Z",
  "status": "placed",
  "complete": true
}
```

- f) Insert the variable `Output` in the **Assign the output to a variable** field.

**7.** Insert a **Message box** action to see the response body.

- a) Double-click or drag the **Message box** action.
- b) Provide the file path to a text file.
- c) In the **Enter text to log** field, enter `$Output{Body}$`.

**8.** Click **Save** and then click **Run**.

The bot retrieves the response body and prints it to the Message box. A successful response includes `"status":"placed", "complete":true`.

**9.** Use the **Put method** action to update the pet name to "Pluto" and pet status to "sold".

- a) Double-click or drag the **REST Web Services > Put method** action.
- b) Enter the following URI:

```
https://petstore.swagger.io/v2/pet
```

- c) Provide authorization details in the **Custom headers** table.

- 1.** In the **Name** column, enter `api_key`.
- 2.** In the **Value** column, enter `special-key`.

- d) Activate the log file and copy the Pet ID of the first entry.
- e) Copy and paste the following into the **Custom parameters** field, replacing the text in the angle brackets with the value that you copied from the file:

```
{
  "petId": <PetID>,
  "name": "Pluto",
  "status": "sold"
}
```

- f) Insert the variable `Output` in the **Assign the output to a variable** field.

**10.** Move the **Message box** action below the **Put method** action:

- a) Double-click or drag the **Message box** action.
- b) Provide a file path to a text file.
- c) In the **Enter text to log** field, enter `$Output{Body}$`.

**11.** Click **Save** and then click **Run**.

The bot retrieves the response body and prints it to the Message box. A successful response includes `"name":"Pluto", "status":"sold"`.

## SAP package

The **SAP** package contains actions to automate tasks and processes on a SAP application.

The **SAP** package enables you to perform the following tasks:

- Reduce the time required to combine data from disparate systems.
- Eliminate human error and increase efficiency.
- Increase the number of transactions processed.
- Deliver real-time information to various stakeholders.

- Enhance decision-making through comprehensive reports.

---

**Note:**

- You can use the actions in the SAP package with any version of SAP ECC and Oracle Database
  - In SAP **Connect** action, the **Session name** field cannot be shared with TaskBots or any other bots.
- 

## Prerequisites

- Open the Enterprise client and SAP GUI application in the same mode. For example, if you open the Enterprise client in Administrator mode, you must also open the SAP GUI application in Administrator mode.
- Log in to the SAP GUI before capturing objects because the SAP Logon screen is not supported for object capture.
- Enable GUI scripting and accessibility.

See [Enabling Scripting on the Client Side](#), [Enabling Scripting on the Server Side](#), and [Enabling Accessibility settings](#).

- Ensure that one of the following SAP GUI for Windows is installed on the devices that you use to automate SAP-related tasks and to run these tasks:
  - SAP GUI 750 with patch 9
  - SAP GUI 760 with patch 0
  - SAP GUI 760 with patch 1
  - SAP GUI 760 with patch 5

---

**Note:** If SAP GUI 760 with patch 0 is installed on your device, you cannot use the SAP Grid view control **Set Table cell text** and **Get Table Cell Text** actions because of an issue with SAP GUI 760 with patch 0.

---

- Install a Scripting Tracker or a similar tool to retrieve the field path of the SAP object.

## Before you start

Perform the following actions within the **SAP** package as part of using the set of available actions:

1. Establish a connection with the SAP application using the **Connect** action.

Log in to the SAP application using the SAP GUI application. Then use the **Connect** action from the **SAP** package to use this connection and assign a session name. Use this same session name for the other actions.
2. Use the actions to automate a task.
3. After you have automated all the SAP-related tasks, terminate the connection to the SAP application using the **Disconnect** action.

## Actions in the SAP package

The **SAP** package includes the following actions:

Action	Description
Check/uncheck checkbox	<p>Selects or clears a check box.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>In the <b>Action</b> option, select <b>Check</b>, <b>Uncheck</b>, or <b>Toggle</b>.</li> </ul>
Click	<p>Performs a click operation.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> </ul>
Click menu	<p>Clicks a menu item by text or index.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>In the <b>Select</b> option, select <b>Name</b> or <b>Index</b> to specify the name or index of the menu item.</li> </ul>
Connect	See <a href="#">Using Connect action for SAP</a> .
Disconnect	Terminates the connection to the SAP application. In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.
Double click	<p>Performs a double-click operation.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> </ul>
Expand	<p>Expands the item by text or index.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>In the <b>Select</b> option, select <b>Text</b> or <b>Index</b> to specify the text or index of the item.</li> </ul>
Export table	See <a href="#">Using Export table action</a> .

Action	Description
Get cell count	<p>Gets number of cells in a table or grid.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get children name	<p>Gets children control names.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to list variable</b> field, specify the list variable.</li> </ul>
Get children text	<p>Gets the text associated with children control.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to list variable</b> field, specify the list variable.</li> </ul>
Get column count	<p>Gets number of columns in a table or grid.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get row count	<p>Gets number of rows in a table or grid.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get selected item	<p>Gets selected item index from a combo box, page tab, or a tree view control.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>

Action	Description
Get status	<p>Gets status of a radio button or check box.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get table cell index	<p>Gets table cell index for text.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Search text</b> field, specify the text.</li> <li>• Select the <b>Case sensitive search</b> option to specify a case-sensitive search.</li> <li>• Select the <b>All occurrences</b> check box.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get table cell text	<p>Gets table cell text by index.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Row</b> field, specify the number of row from which you want to get the text.</li> <li>• In the <b>Column</b> field, specify the number of column from which you want to get the text.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get text	<p>Gets text from a text box, label, or status bar.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>
Get total item	<p>Gets total item from a combo box, page tab, or tree view control.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>• In the <b>Assign the output to a variable</b> field, specify the variable.</li> </ul>

Action	Description
Left click	<p>Performs a left-click operation.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> </ul>
Right click	<p>Performs a right-click operation.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> </ul>
Select item	<p>Selects an item by text or index.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>In the <b>Select</b> option, select <b>Text</b> or <b>Index</b> to specify the text or index of the item.</li> </ul>
Select radio option	<p>Selects a radio button.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> </ul>
Send virtual key	<p>Sends a virtual key.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Select</b> list, select a key.</li> </ul> <p>See <i>Virtual keys in SAP GUI</i>.</p>
Set table cell text	See <i>Set table cell text</i> .
Set text	<p>Sets the text in an editable field.</p> <ul style="list-style-type: none"> <li>In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Field path</b> field, specify the location or a string variable that contains the location of the object.</li> <li>In the <b>Field value</b> field, specify the text.</li> <li>Select the <b>Append text</b> check box.</li> </ul>

## Using Connect action for SAP

Use the **Connect** action to establish a connection with a SAP system that you want to use to automate SAP-related tasks. This must be the first action you use to automate an SAP-related task.

1. In the **Actions** palette, double-click or drag the **Connect** action from the **SAP** package.
2. Specify a name for the session in the **Session name** field.
3. Select an option to specify the connection type:
  - a) If you have selected **Automatic**, no additional information is required to connect to the SAP application.  
You must be already logged on to SAP logon application as the system uses the available SAP session to connect to a SAP system.
  - b) If you have selected **SAP GUI**, you must manually provide the following details:
    - **Name:** Specify the value in the **Name** field. The value must be same as entered in the **Description** field of the SAP logon system connection parameters.
    - **Client:** Specify a value for the client identifier. You can enter a value of 0 through 999.
    - **User name:** Click the **Credential** tab to select an entry from the Credential Vault. You can also click the **String** tab to enter a value manually.
    - **Password:** Click the **Credential** tab to select an entry from the Credential Vault. You can also click the **String** tab to enter a value manually.
    - **Language:** Specify the two-letter code for the language set on the SAP server.
4. Click **Save**.

### Related tasks

#### [Using Export table action](#)

Use the **Export table** action to export a table to a datatable or CSV file.

#### [Using Set table cell text action](#)

Use the **Set table cell text** action to set the text in a specific cell of a table or a grid.

### Related reference

#### [SAP package](#)

The **SAP** package contains actions to automate tasks and processes on a SAP application.

## Using Export table action

Use the **Export table** action to export a table to a datatable or CSV file.

To export a table, follow these steps:

1. In the **Actions** palette, double-click or drag the **Export table** action from the **SAP** package.
2. In the **Session name** field, enter the session name you used to connect to the SAP application in the **Connect** action.
3. In the **Field path** field, specify the location or a string variable that contains the location of the object.

4. In the **Export As** option, select **CSV** or **Datatable** to specify the export option of the table cell:

Choice	Steps
<b>CSV</b>	<ol style="list-style-type: none"> <li>a. In the <b>File Path</b> field, specify the location or file variable.</li> <li>b. <b>Optional:</b> In the <b>Encoding</b> field, specify the value.</li> <li>c. Select the <b>Export data with header</b> check box to export with header.</li> <li>d. In the <b>When saving</b> field, select <b>Append to existing log file</b> or <b>Overwrite existing log file</b> to append the log file or overwrite the content within the log file.</li> </ol>
<b>Datatable</b>	In the <b>Datatable</b> field, specify the value.

5. Click **Save**.

## Using Set table cell text action

Use the **Set table cell text** action to set the text in a specific cell of a table or a grid.

To set a value in a table cell, follow these steps:

1. In the **Actions** palette, double-click or drag the **Set table cell text** action from the **SAP** package.
2. In the **Session name** field, enter the session name you used to connect to the SAP application in the **Connect** action.
3. In the **Field path** field, specify the location or a string variable that contains the location of the object.
4. In the **Select** option, select **Text** or **Index** to specify the text or index of the table cell:
  - **Text:** In the **Find Text** field, specify the value.  
The system searches for the cell that contains the value.
  - **Index:** In the **Row** and **Column** fields, specify the value.
5. In the **Set Text** field, enter the text to set the table cell.
6. Click **Save**.

## Actions supported in various SAP versions

Review the information about the various actions that are supported with 11.x and Automation 360 and which SAP GUI versions support them.

Control name	Automation 360 supported action	11.x supported action	SAP Logon 730	SAP Logon 740	SAP Logon 750	SAP Logon 760 (Patch 5)
Text box	Set Text	Set Text	Yes	Yes	Yes	Yes
	Append Text	Append Text	Yes	Yes	Yes	Yes
	Get Property	Get Property	Yes	Yes	--	Yes
	Set Focus	Set Focus	Yes	Yes	Yes	Yes

Control name	Automation 360 supported action	11.x supported action	SAP Logon 730	SAP Logon 740	SAP Logon 750	SAP Logon 760 (Patch 5)
	Left Click	Left Click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
Combo box	Select item by index	Select item by index	No	Yes	Yes	Yes
	Select item by text	Select item by text	No	Yes	Yes	Yes
	Select item by key	Select item by key	Yes	Yes	Yes	Yes
	Expand		Yes	Yes	--	Yes
	Get total items	Get total items	No	Yes	Yes	Yes
	Get selected text	Get selected item text	No	Yes	Yes	Yes
	Get selected item key	Get selected item key	Yes	Yes	Yes	Yes
	Get selected index	Get selected item index	No	Yes	--	Yes
	Get property	Get property	Yes	Yes	--	Yes
	Set focus	Set focus	Yes	Yes	Yes	Yes
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
	Check box	Check	Check	Yes	Yes	--
Uncheck		Uncheck	Yes	Yes	--	Yes
Toggle		Toggle	Yes	Yes	--	Yes
Get status		Get status	Yes	Yes	--	Yes
Get property		Get property	Yes	Yes	--	Yes
Set focus		Set focus	Yes	Yes	Yes	Yes
Left click		Left click	Yes	Yes	--	Yes
Right-click		Right-click	Yes	Yes	--	Yes
Double-click	Double-click	Yes	Yes	--	Yes	
Button	Click	Click	No	No	NA	No
	Get property	Get property	Yes	Yes	--	Yes
	Set Focus	Set Focus	Yes	Yes	Yes	Yes

Control name	Automation 360 supported action	11.x supported action	SAP Logon 730	SAP Logon 740	SAP Logon 750	SAP Logon 760 (Patch 5)
	Left click	Left click	Yes	Yes	Yes	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
Radio button	Select	Select	Yes	Yes	Yes	Yes
	Get status	Get status	Yes	Yes	Yes	Yes
	Get property	Get property	Yes	Yes	--	Yes
	Set focus	Set focus	Yes	Yes	Yes	Yes
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
Table	Set cell by index	Set cell by index	Yes	Yes	--	Yes
	Set cell by text		Yes	Yes	--	Yes
	Get cell text by index	Get cell text by index	Yes	Yes	--	Yes
	Get cell index by text		Yes	Yes	--	Yes
	Get total rows	Get total rows	Yes	Yes	--	Yes
	Get total columns	Get total columns	Yes	Yes	--	Yes
		Select row	--	--	--	--
		Export to CSV	--	--	--	--
	Get property	Get property	Yes	Yes	--	Yes
		Set focus	--	--	--	--
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
		Get Table	Yes	Yes	--	Yes
	Click	No	No	--	No	
Menu bar	Select item by text	Select item by text	Yes	Yes	Yes	Yes
	Get property	Get property	Yes	Yes	--	Yes
	Set focus	Set focus	Yes	Yes	Yes	Yes

Control name	Automation 360 supported action	11.x supported action	SAP Logon 730	SAP Logon 740	SAP Logon 750	SAP Logon 760 (Patch 5)
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
		Double-click	--	--	--	--
	Get total items		Yes	Yes	--	Yes
	Select item by index		Yes	Yes	--	Yes
	Select item by text		No	No	--	No
Tree	Expand node	Expand node	Yes	Yes	Yes	Yes
		Select node by text	--	--	--	--
	Get property	Get property	Yes	Yes	--	Yes
	Set focus	Set focus	Yes	Yes	Yes	Yes
	Get total items		Yes	Yes	--	Yes
	Get selected index		Yes	Yes	--	Yes
	Get selected text		Yes	Yes	--	Yes
	Select item by index		Yes	Yes	--	Yes
	Select item by text		Yes	Yes	--	Yes
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
	Tab	Select	Select	Yes	Yes	Yes
Scroll Left		Scroll to left	Yes	Yes	Yes	Yes
Get property		Get property	Yes	Yes	Yes	Yes
Set focus		Set focus	Yes	Yes	Yes	Yes
Left click		Left click	Yes	Yes	Yes	Yes
Right-click		Right-click	Yes	Yes	Yes	Yes
Double-click		Double-click	Yes	Yes	Yes	Yes
Grid view		Select all	--	--	--	--

Control name	Automation 360 supported action	11.x supported action	SAP Logon 730	SAP Logon 740	SAP Logon 750	SAP Logon 760 (Patch 5)
	Select cell by index	Select cell by index	Yes	Yes	--	Yes
	Select cell by text		Yes	Yes	--	Yes
	Set current row		--	--	--	--
	Select row		--	--	--	--
	Click cell by index		--	--	--	--
	Double-click current cell		--	--	--	--
	Get total rows	Get total rows	Yes	Yes	--	Yes
	Get total columns	Get total columns	Yes	Yes	--	Yes
	Get cell by index	Get cell by index	Yes	Yes	--	Yes
	Get cell index by text		Yes	Yes	--	Yes
	Export to CSV		--	--	--	--
	Get property	Get property	Yes	Yes	--	Yes
	Set focus		--	--	--	--
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
	Click		No	No	--	No
	Get table		Yes	Yes	--	Yes
Main window	Send key		--	--	--	--
	Close window		--	--	--	--
	Maximize window		--	--	--	--
	Activate window		--	--	--	--
	Restore window		--	--	--	--

Control name	Automation 360 supported action	11.x supported action	SAP Logon 730	SAP Logon 740	SAP Logon 750	SAP Logon 760 (Patch 5)
		Execute scripts	--	--	--	--
		Get focus control ID	--	--	--	--
	Get property	Get property	--	--	--	--
		Set focus	--	--	--	--
	Left click	Left click	--	--	--	--
	Right-click	Right-click	--	--	--	--
	Double-click	Double-click	--	--	--	--
Toolbar		Press button	--	--	--	--
		Select context-menu item by text	--	--	--	--
	Get property	Get property	Yes	Yes	--	Yes
		Set focus	--	--	--	--
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
	Click		No	No	--	No
Label	Get property	Get property	Yes	Yes	--	Yes
	Set focus	Set focus	Yes	Yes	Yes	Yes
	Left click	Left click	Yes	Yes	--	Yes
	Right-click	Right-click	Yes	Yes	--	Yes
	Double-click	Double-click	Yes	Yes	--	Yes
	Click	Click	No	No	--	No
Rest of the control (It includes controls such as: GuiMainWindow, GuiBox, GuiUserArea, GuiTitlebar, and GuiStatusbar)	Get property	Get property	--	--	--	--
	Set focus	Set focus	Yes	Yes	Yes	Yes
	Left click	Left click	--	--	--	--
	Right-click	Right-click	--	--	--	--
	Double-click	Double-click	--	--	--	--

## SAP BAPI package

The **SAP BAPI** package contains actions to automate tasks and processes using SAP Business Application Programming Interface (BAPI). BAPI is a standardized method that enables a third-party application to interact with an SAP system.

### Before you start

Perform the following actions within the **SAP BAPI** package as part of using the set of available actions:

1. Establish a connection with the SAP application using the **Connect** action.
2. Use the **Create function** action to create a user-defined function for the specified SAP BAPI function. Select the **Begin sequence** option to mark the start of a process followed by the actions to automate a task.
3. Use the **Run function** action to run the function you have created using the **Create function** action. Select the **End sequence** option to mark the end of a process and the **Commit transaction** option to commit the changes.

### Actions in the SAP BAPI package

The **SAP BAPI** package includes the following actions:

Action	Description
Connect	See <i>Using Connect action for SAP BAPI</i> .
Create function	<p>Creates an alias for a SAP BAPI function and saves it with an alias name. You can use the alias name in other actions to use that BAPI function in those actions.</p> <ul style="list-style-type: none"> <li>• In the <b>Session name</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Function alias name</b> field, enter the alias that you want to use for the BAPI function.</li> <li>• In the <b>BAPI name</b> field, enter name of the SAP BAPI function for which you want to create the alias.</li> <li>• Select the <b>Begin sequence</b> option if you want to execute the BAPI in a particular sequence to mark the start of a process.</li> </ul>

Action	Description
Get field value	<p>Obtains data of a specific field from a function, table, or structure.</p> <ul style="list-style-type: none"> <li>In the <b>BAPI function alias</b> field, enter the alias you have provided for SAB BAPI function using the <b>Create function</b> action.</li> <li>Select one of the following option to specify whether you want to obtain data from a function, table, or structure: <ul style="list-style-type: none"> <li><b>Function:</b> Enables you to get the value of a field from a function.</li> <li><b>Table:</b> Enables you to get the value of a field from a table in a SAP BAPI function. You must specify the <b>Table alias</b> from which you want to obtain data. You must use the <b>Get table</b> action before you use the <b>Get field</b> action to obtain the value of a field from a table in a SAP BAPI function. You must also specify the <b>Table alias</b> from which you want to get data.</li> <li><b>Structure:</b> Enables you to obtain data from a structure in a SAP application. You must use the <b>Get structure</b> action before you use the <b>Get field</b> action to obtain the value of a field from a structure in a SAP BAPI function. You must also specify the <b>Table alias</b> from which you want to obtain data.</li> </ul> </li> <li>In the <b>Field name</b> field, enter the name of the field from which you want to get data.</li> <li>In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>In the <b>Save the output to a variable</b> field, specify a string variable.</li> </ul>
Get structure	<p>Obtains data from a structure using the function alias.</p> <ul style="list-style-type: none"> <li>In the <b>BAPI function alias</b> field, enter the alias you have provided for SAB BAPI function using the <b>Create function</b> action.</li> <li>In the <b>Structure name</b> field, enter the name of the structure from which you want to get data.</li> <li>In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>Select one of the following options to specify how you want to save the data retrieved from the structure: <ul style="list-style-type: none"> <li><b>Alias:</b> Enables you to provide an alias for the structure and use the alias in other actions.</li> <li><b>Variable:</b> Enables you to store the data retrieved from the structure in a table variable.</li> </ul> </li> </ul>

Action	Description
Get table	<p>Gets tabular data from a table using the function alias.</p> <ul style="list-style-type: none"> <li>• In the <b>BAPI function alias</b> field, enter the alias you have provided for SAB BAPI function using the <b>Create function</b> action.</li> <li>• In the <b>Table name</b> field, enter the name of the table from which you want to obtain data.</li> <li>• In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• Select one of the following options to specify how you want to save the data retrieved from the table: <ul style="list-style-type: none"> <li>• <b>Alias</b>: Enables you to provide an alias for the table and use the alias in other actions.</li> <li>• <b>Variable</b>: Enables you to store the data retrieved from the table in a table variable.</li> </ul> </li> </ul>
Run function	<p>Runs the SAP BAPI function.</p> <ul style="list-style-type: none"> <li>• In the <b>BAPI function alias</b> field, enter the alias you have provided for SAB BAPI function using the <b>Create function</b> action.</li> <li>• Select the <b>End sequence</b> option to mark the end of a process and the <b>Commit transaction</b> option to commit the changes made during the process.</li> </ul> <p>If you want to end a sequence, you must select the <b>Begin sequence</b> option from the <b>Create function</b> action. If you have used queued Remote Function Call (qRFC), you must select the <b>Commit transaction</b> option to commit the changes you have made.</p> <ul style="list-style-type: none"> <li>• In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> </ul>

Action	Description
Set field value	<p>Sets data into a function, table, or structure using the function alias.</p> <ul style="list-style-type: none"> <li>• In the <b>BAPI function alias</b> field, enter the alias you have provided for SAB BAPI function using the <b>Create function</b> action.</li> <li>• Select one of the following options to specify whether you want to set data in a function, table, or structure: <ul style="list-style-type: none"> <li>• <b>Function:</b> Enables you to set data in a function.</li> <li>• <b>Table:</b> Enables you to set data in a table in a SAP application.</li> </ul> <p>You must use the <b>Get table</b> action before you use the <b>Get field</b> action to obtain the value of a field from a table in a SAP BAPI function. You must specify the <b>Table alias</b> in which you want to set data. You can also select the <b>Create new row</b> option if you want to create a new row in the table and set value in that row.</p> </li> <li>• <b>Structure:</b> Enables you to set data in a structure in a SAP application.</li> </ul> <p>You must use the <b>Get structure</b> action before you use the <b>Get field</b> action to obtain the value of a field from a structure in a SAP BAPI function. You must also specify the <b>Structure alias</b> from which you want to get data.</p> <ul style="list-style-type: none"> <li>• In the <b>Field name</b> field, enter the name of the field in which you want to set data.</li> <li>• In the <b>Field value</b> field, enter the value that you want to set.</li> <li>• In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> </ul>

Action	Description
Run standard workflow	<p>Enables you to run a standard workflow in SAP BAPI.</p> <ul style="list-style-type: none"> <li>• Use the <b>Select workflow</b> option to select the workflow from the <b>Standard BAPI Selector</b> dialog box.</li> <li>• The <b>Import to BAPI</b> section displays the import parameters for the selected workflow. You can select the <b>Edit</b> option from the action menu (vertical ellipsis) to specify a value for the parameters. <ul style="list-style-type: none"> <li>• Select the <b>Include</b> option if you want to use that import parameter.</li> <li>• Select the <b>Table</b> tab to select a table variable containing the values you want to import to BAPI. Alternatively, select the <b>Strings</b> tab to specify the value manually.</li> </ul> </li> <li>• The <b>Export to BAPI</b> section displays the export parameters for the selected workflow. You can select the <b>Edit</b> option from the action menu (vertical ellipsis) to specify a value for the parameters. <ul style="list-style-type: none"> <li>• Select the <b>Include</b> option if you want to use that export parameter.</li> </ul> </li> <li>• The <b>Tables</b> section displays the tables you can use as export or import parameters for your selected workflow. You can select the <b>Edit</b> option from the action menu (vertical ellipsis) to specify a value for the tables. <ul style="list-style-type: none"> <li>• Select the <b>Include</b> option if you want to use that table as an export or import parameter.</li> <li>• Select either the <b>Import</b> tab to use a table as an import parameter or select the <b>Export</b> tab to use a table as an export parameter.</li> <li>• Select the <b>Table</b> tab to select a table variable containing the values you want to import to BAPI. Alternatively, select the <b>Strings</b> tab to specify the value manually.</li> </ul> </li> <li>• Select the <b>Begin sequence</b> option if you want to execute the BAPI in a particular sequence to mark the start of a process.</li> <li>• Select the <b>End sequence</b> option to mark the end of a process.</li> <li>• Select the <b>Commit transaction</b> option to commit the changes made during the process.</li> <li>• In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Save exported structures and scalars</b> field, specify a dictionary variable.</li> <li>• In the <b>Save exported tables</b> field, specify a dictionary variable.</li> </ul>

Action	Description
Run custom workflow	<p>Enables you to run a custom workflow in SAP BAPI.</p> <ul style="list-style-type: none"> <li>• Select the custom workflow you want to run from the <b>Select Custom workflow</b> list.</li> <li>• The <b>Import to BAPI</b> section displays the import parameters for the selected workflow. You can select the <b>Edit</b> option from the action menu (vertical ellipsis) to specify a value for the parameters. <ul style="list-style-type: none"> <li>• Select the <b>Include</b> option if you want to use that import parameter.</li> <li>• Select the <b>Table</b> tab to select a table variable containing the values you want to import to BAPI. Alternatively, select the <b>Strings</b> tab to specify the value manually.</li> </ul> </li> <li>• The <b>Export to BAPI</b> section displays the export parameters for the selected workflow. You can select the <b>Edit</b> option from the action menu (vertical ellipsis) to specify a value for the parameters. <ul style="list-style-type: none"> <li>• Select the <b>Include</b> option if you want to use that export parameter.</li> </ul> </li> <li>• The <b>Tables</b> section displays the tables you can use as export or import parameters for your selected workflow. You can select the <b>Edit</b> option from the action menu (vertical ellipsis) to specify a value for the tables. <ul style="list-style-type: none"> <li>• Select the <b>Include</b> option if you want to use that table as an export or import parameter.</li> <li>• Select either the <b>Import</b> tab to use a table as an import parameter or select the <b>Export</b> tab to use a table as an export parameter.</li> <li>• Select the <b>Table</b> tab to select a table variable containing the values you want to import to BAPI. Alternatively, select the <b>Strings</b> tab to specify the value manually.</li> </ul> </li> <li>• Select the <b>Begin sequence</b> option if you want to execute the BAPI in a particular sequence to mark the start of a process.</li> <li>• Select the <b>End sequence</b> option to mark the end of a process.</li> <li>• Select the <b>Commit transaction</b> option to commit the changes made during the process.</li> <li>• In the <b>SAP BAPI session</b> field, enter the session name you used to connect to the SAP application in the <b>Connect</b> action.</li> <li>• In the <b>Save exported structures and scalars</b> field, specify a dictionary variable.</li> <li>• In the <b>Save exported tables</b> field, specify a dictionary variable.</li> </ul>

## Using Connect action for SAP BAPI

Use the **Connect** action to establish a connection with a SAP system that you want to use to automate SAP-related tasks using SAP Business Application Programming Interface (BAPI). This must be the first action you use to automate an SAP-related task using SAP BAPI.

Download the SAP Java connector package and DLL from the SAP website.

1. In the **Actions** palette, double-click or drag the **Connect** action from the **SAP** package.
2. Specify a name for the session in the **SAP BAPI Session** field.

3. Select one of the following options to specify the location of the SAP Java connector package:
  - **Control Room file:** Enables you to select the SAP Java connector package that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select the SAP Java connector package that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the SAP Java connector package.
4. Select one of the following options to specify the location of the SAP Java connector DLL:
  - **Control Room file:** Enables you to select the SAP Java connector DLL that is available in a folder in the Control Room.
  - **Desktop profile:** Enables you to select the SAP Java connector DLL that is available on your device.
  - **Variable:** Enables you to specify the file variable that contains the location of the SAP Java connector DLL.
5. Select one of the following options to specify the connection type:

Option	Steps
<b>Custom Application Server</b>	Select one of the following options to specify the SAP server hostname: <ul style="list-style-type: none"> <li>• <b>Credential:</b> Enables you to use a value available in the Credential Vault that contains information about the SAP server hostname.</li> <li>• <b>Variable:</b> Enables you to use a credential variable that contains information about the SAP server hostname.</li> <li>• <b>Insecure string:</b> Enables you to enter the hostname for the SAP server.</li> </ul>
<b>Group/Server</b>	<ol style="list-style-type: none"> <li>a. Select one of the following options to specify the SAP message server hostname:               <ul style="list-style-type: none"> <li>• <b>Credential:</b> Enables you to use a value available in the Credential Vault that contains information about the SAP message server hostname.</li> <li>• <b>Variable:</b> Enables you to use a credential variable that contains information about the SAP message server hostname.</li> <li>• <b>Insecure string:</b> Enables you to specify the hostname for the SAP message server.</li> </ul> </li> <li>b. <b>Optional:</b> Specify the gateway host you want to use to connect to the server in the <b>Gateway host</b> field.</li> <li>c. <b>Optional:</b> Specify the logon group you want to use to connect to the server in the <b>Logon group</b> field.</li> </ol>

6. Enter values for the following:

- System number
- **Optional:** SAP instance system ID
- Client number
- Logon language code
- **Optional:** Router string
- Select one of the following options to specify the username you want to use to connect to the SAP server:
  - **Credential:** Enables you to use a value available in the Credential Vault that contains the username.
  - **Variable:** Enables you to use a credential variable that contains the username.
  - **Insecure string:** Enables you to enter the username.
- Select one of the following options to specify the password you want to use to connect to the SAP server:
  - **Credential:** Enables you to use a value available in the Credential Vault that contains the password.
  - **Variable:** Enables you to use a credential variable that contains the password.
  - **Insecure string:** Enables you to enter the password.

7. Click **Save**.

## Screen package

Use the **Screen** package to automate the process of capturing screenshots. Using the actions in this package, you can capture an area of an application window, the entire computer screen, or an active open window and save it in a specified location in an image format.

### Actions in the Screen package

The **Screen** package includes the following actions:

Action	Description
Capture area	Captures specified area of an open application. See <a href="#">Using Capture area action</a>
Capture desktop	Captures an image of the full desktop. <ul style="list-style-type: none"> <li>• In the <b>File path to save image</b> field, specify the path where you want to save the captured image. The following file extensions are supported: png, bmp, jpeg, tiff, gif, and wmf.</li> <li>• Select <b>Overwrite file</b> check box to overwrite an existing file with the same name.</li> </ul>
Capture window	Captures screenshots of an open application window. See <a href="#">Using Capture window action</a>

## Secure Recording

When secure recording mode is enabled, bots do not capture object images or values. This ensures that sensitive data is not stored in the bots.

When you record a task in secure recording mode, the **Preview** window temporarily shows the captured area. This image is deleted after you navigate away from the action editor window.

A user with admin privileges must enable this setting. See [Settings](#).

## Using Capture area action

Use the **Capture area** action in the Screen package to capture a screenshot of the application window area.

To capture a specified area of an application window, perform these steps:

1. In the **Actions** palette, double-click or drag the **Capture area** action from the Screen package.
2. Specify the window in which to capture an object.

Choose from the **Application**, **Browser**, or **Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows. This option shows a list of all the application and browser windows that are open on the Bot Creator device.
<b>Browser</b>	Select from a list of Google Chrome tabs that are currently open on the Bot Creator device.  <b>Note:</b> Currently, this option only supports Google Chrome tabs. For all other browsers, use the <b>Application</b> option.
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.

3. Optional: Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value.

For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad)` for all the window title names starting with `((\w*)-Notepad)`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

**Note:** During runtime, verify that the TaskBot identifies the correct window. If it does not, do the following:

- a. Open the application or browser window.
- b. Drag a **Window > Get active window title** action above the **Recorder > Capture** action.
- c. Insert a string variable into the **Assign the window title to variable** field.

- d. Drag a **Window > Set title** action below the **Window > Get active window title** action.
- e. In the **Window** field, insert the window variable generated by the **Recorder > Capture** action.
- f. In the **New window title** field, insert the string variable from the **Get active window title** action.
- g. Click **Save**.

---

**4.** Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

**5.** Click the **Capture region**.

The pixel coordinates of the captured area are displayed in the **X, Y, Width, and Height** fields. You can modify these values.

**6.** Browse to select the **File path to save image**.

The following file extensions are supported: png, bmp, jpeg, tiff, gif, and wmf.

**7.** Click **Overwrite file** to replace an existing file with the same name.

**8.** Click **Save**.

## Using Capture window action

Use the **Capture window** action of the Screen package to capture an open application window.

To capture an application window, perform these steps:

1. In the **Actions** palette, double-click or drag the **Capture window** action from the Screen package.
2. Specify the window in which to capture an object.

Choose from the **Application, Browser, or Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows. This option shows a list of all the application and browser windows that are open on the Bot Creator device.
<b>Browser</b>	Select from a list of Google Chrome tabs that are currently open on the Bot Creator device.  <b>Note:</b> Currently, this option only supports Google Chrome tabs. For all other browsers, use the <b>Application</b> option.
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.

3. Optional: Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value.

For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad` for all the window title names starting with `((\w*)-Notepad`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

---

**Note:** During runtime, verify that the TaskBot identifies the correct window. If it does not, do the following:

- a. Open the application or browser window.
- b. Drag a **Window > Get active window title** action above the **Recorder > Capture** action.
- c. Insert a string variable into the **Assign the window title to variable** field.
- d. Drag a **Window > Set title** action below the **Window > Get active window title** action.
- e. In the **Window** field, insert the window variable generated by the **Recorder > Capture** action.
- f. In the **New window title** field, insert the string variable from the **Get active window title** action.
- g. Click **Save**.

---

**4.** Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

**5.** Browse to select the **File path to save image**.

The following file extensions are supported: `png`, `bmp`, `jpeg`, `tiff`, `gif`, and `wmf`.

- 6.** Click **Overwrite file** to replace an existing file with the same name.
- 7.** Click **Save**.

## Service package

Use the Service package to automate operations in Windows and application services including starting, stopping, pausing, resuming, or getting the status of services.

---

**Note:** You must have administrator privileges to start, stop, pause, or resume service operations.

---

## Actions in the Services package

The Services package includes the following actions:

Action	Description
Get service status	Retrieves the current status of a Windows or application service. You can store the status of the selected service by assigning it to a selected variable.  Example: The Windows Audio service status might be running. You can assign the status value to a selected variable.
Pause service	Pauses a Windows or application service that is currently running.
Resume service	Restarts a selected Windows or application service that was previously paused.
Start service	Starts a selected Windows or application service that is not running.
Stop service	Stops a selected Windows or application service that is currently running.

## Simulate keystrokes package

Use the Simulate keystrokes package to simulate keystrokes in Chinese (simplified and traditional), English, French, German, Japanese, Korean, Italian, or Spanish characters.

### Action in the Simulate keystrokes package

The Simulate keystrokes package includes the following action:

Action	Description
Keystrokes	See <a href="#">Using Keystrokes action</a> .

Watch the following video on how to use Simulate keystrokes:

### Related tasks

[Build a basic bot that uses a desktop application](#)

Build a bot that uses a conditional statement to verify that the calculator is open, then uses the calculator to multiply two numbers. This example uses actions from the Application, If, Simulate keystrokes, Message Box, and Window packages.

## Using Keystrokes action

Use the **Keystrokes** action to simulate keystrokes.

Follow these steps to add a **Keystrokes** action:

1. In the **Actions** palette, double-click or drag the **Keystrokes** action from the **Keystrokes** package.
2. Specify the window in which to capture an object.

Choose from the **Application**, **Browser**, or **Variable** tab.

Option	Description
<b>Application</b>	Select from a list of currently active windows. This option shows a list of all the application and browser windows that are open on the Bot Creator device.
<b>Browser</b>	Select from a list of Google Chrome tabs that are currently open on the Bot Creator device. <hr/> <b>Note:</b> Currently, this option only supports Google Chrome tabs. For all other browsers, use the <b>Application</b> option. <hr/>
<b>Variable</b>	Select an existing window variable to specify the title of the application window title.

Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value. For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad` for all the window title names starting with `((\w*)-Notepad`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

**3.** Optional: Select the **Resize window** option to specify the window dimensions.

This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.

- If the window is maximized when you record the task, this option is unselected.
- If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

**4.** In the **Keystrokes**, select a radio button:

- **Enter keystrokes here or use the on-screen keyboard:** Type or use the keyboard to enter keystrokes.
- **Select a credential:** Uses a password stored in the Credential Vault.

**5. Optional:** In the **Delay between each keystroke in ms** field, the delay time.

---

**Note:** The default is set to 10 milliseconds.

---

**6.** Click **Save**.

## SNMP package

The SNMP package allows you to automate network management tasks, such as retrieving and modifying data, and sending notification messages.

Simple Network Management Protocol (SNMP) is used to find the network management component on one or more computers and the managed component on multiple network devices.

The Automation Anywhere SNMP action offers powerful network management. Using this action, users can easily monitor network devices configured with SNMP agent software. Network devices such as servers, workstations, printers, routers, bridges, and hubs, as well as services such as Dynamic Host Configuration Protocol (DHCP) or Windows Internet Name Service (WINS) can be monitored.

### Actions in the SNMP package

The SNMP package includes the following actions:

Action	Description
Get	See <a href="#">Using Get action</a>
Get next	See <a href="#">Using Get next action</a>
Send trap	See <a href="#">Using Send trap action</a>
Set	See <a href="#">Using Set action</a>
Walk	See <a href="#">Using Set action</a>

### Related reference

#### [Active Directory package](#)

Use the **Active Directory** package to automate actions in the Active Directory. An Active Directory is a directory service provided by Microsoft to assist the admin in managing users across a group or organization.

#### [Printer package](#)

Use the actions in the Printer package to automate retrieving and setting the default printer.

## Using Get action

Use the **Get** action in the SNMP package to retrieve data of an object that is managed by an SNMP agent.

1. In the **Actions** palette, double-click or drag the **Get** action from the SNMP package.
2. In the **Agent** field, enter details of the device on which the SNMP agent is available.
3. In the **SNMP Version** section, select an option to specify the SNMP version to be used.

Option	Action
<b>V1</b>	Specify the community string you want to use in the <b>Community</b> field.
<b>V2C</b>	Specify the community string you want to use in the <b>Community</b> field.

Option	Action
<b>V3</b>	<p>Specify the community string you want to use in the <b>Community</b> field.</p> <p>Select an option from the <b>Authentication level</b> list to specify the authentication level you want to use.</p> <ul style="list-style-type: none"> <li>• <b>None:</b> No authentication will be used.</li> <li>• <b>Authentication Only:</b> Enables you to use authentication only. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> <li>• <b>Authentication and privacy:</b> Enables you to use authentication and privacy. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> <li>c. Select <b>DES</b> or <b>AES</b> from the <b>Privacy method</b> list to specify the privacy method you want to use.</li> <li>d. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> </ul>

4. In the **Object ID** field, specify the ID of the object for which you want to retrieve details.
5. In the **Data type** section, select the **ASCII** or **Hex** option to specify the format in which you want to retrieve details of the object.
6. In the **SNMP advanced option** section, complete the following fields:
  - **Timeout:** Specify the time (in milliseconds) for the action to wait before generating an error.
  - **Remote port:** Specify the port number of the remote device.
  - **Retries:** Specify the maximum number of times the action must try to retrieve the details.

7. In the **Result** section, select an option:
  - **Control Room file:** Uses a file that is available on the Control Room to store the result.
  - **Desktop file:** Uses a file that is available on a device to store the result.
  - **Variable:** Uses a file variable to specify the file location that you want to use to store the result.
8. Select a string variable from the **Assigned to** list.
9. Click **Save**.

## Using Get next action

Use the **Get next** action in the SNMP package to retrieve data of the next object that is managed by an SNMP agent.

1. In the **Actions** palette, double-click or drag the **Get next** action from the SNMP package.
2. In the **Agent** field, enter details of the device on which the SNMP agent is available.
3. In the **SNMP Version** section, select an option to specify the SNMP version to be used.

Option	Action
<b>V1</b>	Specify the community string you want to use in the <b>Community</b> field.
<b>V2C</b>	Specify the community string you want to use in the <b>Community</b> field.

Option	Action
<b>V3</b>	<p>Specify the community string you want to use in the <b>Community</b> field.</p> <p>Select an option from the <b>Authentication level</b> list to specify the authentication level you want to use.</p> <ul style="list-style-type: none"> <li>• <b>None:</b> No authentication will be used.</li> <li>• <b>Authentication Only:</b> Enables you to use authentication only. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> <li>• <b>Authentication and privacy:</b> Enables you to use authentication and privacy. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> <li>c. Select <b>DES</b> or <b>AES</b> from the <b>Privacy method</b> list to specify the privacy method you want to use.</li> <li>d. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> </ul>

4. In the **Object ID** field, specify the ID of the object for which you want to retrieve details.
5. In the **Data type** section, select the **ASCII** or **Hex** option to specify the format in which you want to retrieve details of the object.
6. In the **SNMP advanced option** section, complete the following fields:
  - **Timeout:** Specify the time (in milliseconds) for the action to wait before generating an error.
  - **Remote port:** Specify the port number of the remote device.
  - **Retries:** Specify the maximum number of times the action must try to retrieve the details.

7. In the **Result** section, select an option:
  - **Control Room file:** Uses a file that is available on the Control Room to store the result.
  - **Desktop file:** Uses a file that is available on a device to store the result.
  - **Variable:** Uses a file variable to specify the file location that you want to use to store the result.
8. Select a string variable from the **Assigned to** list.
9. Click **Save**.

## Using Send trap action

Use the **Send trap** action in the SNMP package to send messages to the SNMP manager from an SNMP agent. These messages are sent by an SNMP agent whenever certain events occur, such as a system restart.

1. In the **Actions** palette, double-click or drag the **Send trap** action from the SNMP package.
2. In the **Agent** field, enter details of the device on which the SNMP agent is available.
3. In the **SNMP Version** section, select an option to specify the SNMP version to be used.

Option	Action
<b>V1</b>	Specify the community string you want to use in the <b>Community</b> field.
<b>V2C</b>	Specify the community string you want to use in the <b>Community</b> field.

Option	Action
<b>V3</b>	<p>Specify the community string you want to use in the <b>Community</b> field.</p> <p>Select an option from the <b>Authentication level</b> list to specify the authentication level you want to use.</p> <ul style="list-style-type: none"> <li>• <b>None:</b> No authentication will be used.</li> <li>• <b>Authentication Only:</b> Enables you to use authentication only. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> <li>• <b>Authentication and privacy:</b> Enables you to use authentication and privacy. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> <li>c. Select <b>DES</b> or <b>AES</b> from the <b>Privacy method</b> list to specify the privacy method you want to use.</li> <li>d. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> </ul>

4. In the **Object ID** field, specify the ID of the object for which you want to retrieve details.
5. Optional: In the **Authorative ID** field, specify the ID of the SNMP manager that will receive the notification.

---

**Important:** If you have selected **V3** from the **SNMP Version** list, you must provide a value for **Authorative ID**.

---

6. Select an option from the **Select trap type** list to specify the type of trap you want to send.
  - **Cold start:** Occurs when the SNMP agent initializes its configuration tables.
  - **Warm start:** Occurs when the SNMP agent reinitializes its configuration tables.
  - **Link down:** Occurs when the state of a network adapter on the SNMP agent changes from up to down.
  - **Link up:** Occurs when the state of a network adapter on the SNMP agent changes from down to up.
  - **Authentication fail:** Occurs when the SNMP agent receives a message from an SNMP manager with an invalid community name.
  - **EGP neighbour loss:** Occurs when the SNMP agent cannot communicate with its Exterior Gateway Protocol (EGP) peer.
  - **Enterprise specific:** Occurs when specific error conditions and error codes are defined in the system. The user provides a trap-specific number for this option.
7. In the **SNMP advanced option** section, complete the following fields:
  - **Timeout:** Specify the time (in milliseconds) for the action to wait before generating an error.
  - **Remote port:** Specify the port number of the remote device.
  - **Retries:** Specify the maximum number of times the action must try to retrieve the details.
8. In the **Result** section, select an option:
  - **Control Room file:** Uses a file that is available on the Control Room to store the result.
  - **Desktop file:** Uses a file that is available on a device to store the result.
  - **Variable:** Uses a file variable to specify the file location that you want to use to store the result.
9. Click **Save**.

## Using Set action

Use the **Set** action in the SNMP package to set a value for an object managed by the SNMP agent.

1. In the **Actions** palette, double-click or drag the **Set** action from the SNMP package.
2. In the **Agent** field, enter details of the device on which the SNMP agent is available.
3. In the **SNMP Version** section, select an option to specify the SNMP version to be used.

Option	Action
<b>V1</b>	Specify the community string you want to use in the <b>Community</b> field.
<b>V2C</b>	Specify the community string you want to use in the <b>Community</b> field.

Option	Action
<b>V3</b>	<p>Specify the community string you want to use in the <b>Community</b> field.</p> <p>Select an option from the <b>Authentication level</b> list to specify the authentication level you want to use.</p> <ul style="list-style-type: none"> <li>• <b>None:</b> No authentication will be used.</li> <li>• <b>Authentication Only:</b> Enables you to use authentication only. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> <li>• <b>Authentication and privacy:</b> Enables you to use authentication and privacy. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> <li>c. Select <b>DES</b> or <b>AES</b> from the <b>Privacy method</b> list to specify the privacy method you want to use.</li> <li>d. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> </ul>

4. In the **Object ID** field, specify the ID of the object for which you want to retrieve details.

5. From the **Value type** list, select an option to specify the value you want to set.
  - **OctetString**
  - **Integer**
  - **Gauge**
  - **TimeTicks**
  - **IP**
  - **ObjectID**
  - **OctetByteString**
  - **OctetDecimalByteString**
  - **NULL**
6. In the **Set value** field, specify the value you want to set.
7. In the **SNMP advanced option** section, complete the following fields:
  - **Timeout:** Specify the time (in milliseconds) for the action to wait before generating an error.
  - **Remote port:** Specify the port number of the remote device.
  - **Retries:** Specify the maximum number of times the action must try to retrieve the details.
8. In the **Result** section, select an option:
  - **Control Room file:** Uses a file that is available on the Control Room to store the result.
  - **Desktop file:** Uses a file that is available on a device to store the result.
  - **Variable:** Uses a file variable to specify the file location that you want to use to store the result.
9. Click **Save**.

## Using Walk action

Use the **Walk** action in the SNMP package to set up a collection of information about all the devices available on all the connected nodes or subtree.

1. In the **Actions** palette, double-click or drag the **Walk** action from the SNMP package.
2. In the **Agent** field, enter details of the device on which the SNMP agent is available.
3. In the **SNMP Version** section, select an option to specify the SNMP version to be used.

Option	Action
<b>V1</b>	Specify the community string you want to use in the <b>Community</b> field.
<b>V2C</b>	Specify the community string you want to use in the <b>Community</b> field.

Option	Action
<b>V3</b>	<p>Specify the community string you want to use in the <b>Community</b> field.</p> <p>Select an option from the <b>Authentication level</b> list to specify the authentication level you want to use.</p> <ul style="list-style-type: none"> <li>• <b>None:</b> No authentication will be used.</li> <li>• <b>Authentication Only:</b> Enables you to use authentication only. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> <li>• <b>Authentication and privacy:</b> Enables you to use authentication and privacy. <ul style="list-style-type: none"> <li>a. Select <b>MD5</b> or <b>SHA</b> from the <b>Authentication method</b> list to specify the authentication method you want to use.</li> <li>b. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> <li>c. Select <b>DES</b> or <b>AES</b> from the <b>Privacy method</b> list to specify the privacy method you want to use.</li> <li>d. Select <b>Credential</b> to use a value from the Credential Vault, <b>Variable</b> to use a credential variable, or <b>Insecure string</b> to manually specify the value you want to use.</li> </ul> </li> </ul>

4. In the **Object ID** field, specify the ID of the object for which you want to retrieve details.
5. In the **Data type** section, select the **ASCII** or **Hex** option to specify the format in which you want to retrieve details of the object.
6. In the **Walk type** section, select an option to specify the scope from which to collect information.
  - **All:** Displays the variables that are equal to the specified OID for the given tree type structure.
  - **Within:** All variables in the sub-tree below the given OID are queried.

7. In the **SNMP advanced option** section, complete the following fields:
  - **Timeout:** Specify the time (in milliseconds) for the action to wait before generating an error.
  - **Remote port:** Specify the port number of the remote device.
  - **Retries:** Specify the maximum number of times the action must try to retrieve the details.
8. In the **Result** section, select an option:
  - **Control Room file:** Uses a file that is available on the Control Room to store the result.
  - **Desktop file:** Uses a file that is available on a device to store the result.
  - **Variable:** Uses a file variable to specify the file location that you want to use to store the result.
9. Select a string variable from the **Assigned to** list.
10. Click **Save**.

## SOAP Web Service package

Use the **SOAP web service** action from the SOAP Web Service package to access and exchange information between two systems in XML format.

With SOAP Web Service, you can perform these actions:

- Consume SOAP web services written to provide structured data for further business processing, such as currency conversion, weather reports, and language translation.
- Connect to different existing applications and different platforms, irrespective of any underlying infrastructure requirements.

The SOAP Web Service establishes complete interoperability between clients or applications and the internet, supporting XML-based open standards, such as Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description Discovery and Integration (UDDI).

### Passing values securely

You can securely pass values from the Credential Vault to the web service by specifying the locker, credential, and attribute in the following supported action fields:

- Custom headers
- Operation parameters
- Raw data: You must select a Credential Vault value that contains the entire parameter as the value.

### Proxy support

If your device is configured with a proxy, all outbound requests from this package are routed through the proxy server. See [Connect Bot agent to a device with a proxy](#).

---

**Note:** For an example task about using the SOAP Web Service action, see [Example of using the SOAP web service action](#).

---

### Related tasks

[Example of building a bot that uses credential variables](#)

Securely pass values to a bot using credential variables to automate the process of logging in to a bank website.

### Related reference

#### [Credentials and credential variables in the Bot editor](#)

Use credentials when building bots to pass sensitive information such as passwords and account numbers. Using credentials separates the sensitive information from the bots and Bot Runners, which reduces the risk of data spillage or unauthorized user access.

## Step package

The **Step** package groups various actions together and runs them in a specific order. You can provide a relevant name for a step to identify the operation performed by the actions included in that step.

### Action in the Step package

The **Step** package includes the following action:

Action	Description
Step	<p>Runs a sequence of actions.</p> <ul style="list-style-type: none"> <li>• Creates a container for actions without impacting the bot run.</li> <li>• Configures actions within the <b>Step</b> action.</li> <li>• Runs the arranged actions in a sequential order.</li> <li>• Groups various actions for better management.</li> <li>• <b>Optional:</b> In the <b>Title</b> field, specify the title.</li> </ul>

Watch the following video on how to use the Step actions:

## String package

Use the **String** package to perform various operations such as comparing two strings, retrieving the string length, or converting a string to uppercase or lowercase.

### Actions in the String package

The **String** package includes the following actions:

Action	Description
Assign	<p>Assigns or concatenates strings.</p> <ul style="list-style-type: none"> <li>• <b>Optional:</b> In the <b>Select the source string variable(s)/value</b> field, specify the variable or values. This field holds up to 65535 alphanumeric, character, and empty values.</li> </ul> <hr/> <p><b>Note:</b> To provide a string that includes a dollar sign (\$), you must enter two dollar signs. For example, if you enter <code>Pay \$\$5.00</code>, the output will be <code>Pay \$5.00</code>.</p> <hr/> <ul style="list-style-type: none"> <li>• In the <b>Select the destination string variable</b> field, specify the variable.</li> </ul>
Compare	<p>Compares two strings.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Compare to string</b> field, specify the source string.</li> <li>• In the <b>When comparing</b> field, select an option: <ul style="list-style-type: none"> <li>• <b>Match case:</b> Matches capitalization.</li> <li>• <b>Do not match case:</b> Does not match capitalization.</li> </ul> </li> <li>• In the <b>Assign the output to variable</b> list, specify the Boolean variable.</li> </ul>
Extract text	See <a href="#">Using the Extract text action.</a>
Evaluate value	<p>Compares the user-specified string variable with the string variables in the bot and if a match is found, the action returns the value of the matching variable.</p> <ul style="list-style-type: none"> <li>• Enter the string variable to search for.</li> <li>• In the <b>Assign the value to a variable</b> field, select a string variable to hold the returned value.</li> </ul>
Find	See <a href="#">Using Find action.</a>
Generate random string	<p>Generates a string of uppercase and lowercase alphanumeric characters and assigns it to a string variable.</p> <ul style="list-style-type: none"> <li>• In the <b>String length</b> field, enter the number of characters in the generated string.</li> </ul> <hr/> <p><b>Note:</b> The maximum number of characters is 300.</p> <hr/> <ul style="list-style-type: none"> <li>• In the <b>Enter the destination variable</b> field, specify the string variable.</li> </ul>

Action	Description
Import string from text file	<p>Imports values from a variable in a text file into a string variable.</p> <ul style="list-style-type: none"> <li>• Select the text file from the Control Room, desktop, or a file variable.</li> <li>• In the <b>Variable key</b> field, specify the variable that holds the values to import. This field is <b>not</b> case-sensitive.</li> </ul> <p>When a bot runs this action, it retrieves the values between the = sign and line break.</p> <ul style="list-style-type: none"> <li>• In the <b>Assign the output to variable</b> list, specify the variable.</li> </ul> <hr/> <p><b>Note:</b> If you built a bot using this action from the String package from Build 5322 or earlier, the action will be missing when you open the bot with the default package version. You must reinsert the action and repopulate the fields.</p>
Length	<p>Retrieves the string length.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Assign the output to variable</b> list, specify the number variable.</li> </ul>
Lowercase	<p>Converts the source string to lowercase.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Assign the output to variable</b> list, specify the variable.</li> </ul>
Replace	See <a href="#">Using Replace action</a> .
Reverse	<p>Reverses the source string.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Assign the output to variable</b> list, specify the variable.</li> </ul>
Split	See <a href="#">Using Split action</a> .
Substring	<p>Extracts a substring from a string.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Start from</b> field, specify the starting point.</li> <li>• <b>Optional:</b> In the <b>Length</b> field, specify the length.</li> <li>• In the <b>Assign the output to variable</b> list, specify the variable.</li> </ul>
To boolean	<p>Converts a string to a Boolean.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Assign the output to variable</b> list, specify the Boolean variable.</li> </ul>

Action	Description
To number	<p>Converts a string to a number. This action supports positive, negative, and decimal numbers.</p> <hr/> <p><b>Note:</b> If the string contains commas, remove them by using the <b>Replace</b> action to replace each comma with an empty string.</p> <hr/> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Assign the output to variable</b> list, specify the number variable.</li> </ul>
Trim	<p>Trims blanks and whitespaces from a string.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In <b>Trim from the beginning</b> and <b>Trim from the end</b>, select options.</li> <li>• In the <b>Assign the output to variable</b> list, specify the variable.</li> </ul>
Uppercase	<p>Converts the source string to uppercase.</p> <ul style="list-style-type: none"> <li>• In the <b>Source string</b> field, specify the source string.</li> <li>• In the <b>Assign the output to variable</b> list, specify the variable.</li> </ul>

Watch the following video on how to use the String actions:

### Related tasks

[Using the Extract text action](#)

Use the **Extract text** action to extract a range of text using logical operators from the source string.

[Using Find action](#)

Use the **Find** action to find a substring within the specified string.

[Using Replace action](#)

Use the **Replace** action to find a piece of text from the source string and replace it with another text.

[Using Split action](#)

Use the **Split** action to split the specified string into multiple strings and store the output in a list variable.

## Extract text

The **Extract text** action enables you to extract text from a source string. You can extract text before, after, or between two strings.

### Using the **After** Option

This option enables you to extract the entire text followed by the value you have provided in the **Start after text** field. You can also extract the text based on the occurrence of the value you have provided in the field.

For example, a:123a:123b:123c: is the source string, you can specify ':' in the **Start after text** field and '2' in the **Occurrence** field to extract the string followed by the second occurrence of ':' in the source string. In this example, the extracted text is '123b:123c:'.

## Using the **Before** Option

This option enables you to extract the entire text preceding the value you have provided in the **End before text** field. You can also extract the text based on the occurrence of the value you have provided in the field.

For example, `a:123a:123b:123c:` is the source string, you can specify `':` in the **End before text** field and `'3'` in the **Occurrence** field to extract the string preceding the second occurrence of `':` in the source string. In this example, the extracted text is `'a:123a:123b'`.

## Using the **Before and/or after** option

This option enables you to extract the text between the values you have provided in the **Start after text** and the **End before text** fields. You can also apply the **AND** or **OR** logical operator. You can select the **AND** operator to extract text only when both conditions specified for the **Before** and **After** options are satisfied. Otherwise, you can select the **OR** operator to extract text only when either of the conditions specified for the **Before** or the **After** option is satisfied.

For example, `a:123a:123b:123c:` is the source string, you can specify `':` in the **Start after text** and **End before text** fields and `'2'` in the **Occurrence** fields to extract the string after the second and before the fourth occurrence of `':` in the source string. In this example, the extracted text is `'123b:123c'`.

### *Using the Extract text action*

Use the **Extract text** action to extract a range of text using logical operators from the source string.

To extract a substring from the specified source string, do the following:

1. In the **Actions** palette, double-click or drag the **Extract text** action from the **String** package.
2. In the **Source string** field, specify the source string.
3. Specify the text to extract by selecting from the following options:

Option	Steps
<b>Before</b>	<p>Extracts the entire text followed by the value that you have provided in the <b>Start after text</b> field.</p> <ol style="list-style-type: none"> <li>a. In the <b>Start after text</b> field, enter a string to use as the starting point.</li> <li>b. In the <b>Occurrence</b> field, enter a value to specify the number of occurrences.</li> </ol> <p>For example, if the source string is <code>This is a test string which is used to extract specific sub-string and you want to extract the entire text after This</code>. To extract the required text, you must enter <code>This</code> in the <b>Start after text</b> field and <code>1</code> in the <b>Occurrence</b> field. This indicates to the system to extract the text that is available after the first occurrence of <code>This</code> in the source string.</p>

Option	Steps
<b>Before and/or after</b>	<p>Extracts the text between the values provided in the <b>Start after text</b> and the <b>End before text</b> fields.</p> <ol style="list-style-type: none"> <li>In the <b>Start after text</b> field, enter a string to use as the starting point.</li> <li>In the <b>OR</b> or <b>AND</b> field, select one of the options: <ul style="list-style-type: none"> <li><b>OR</b>: Select to extract text if either of the values specified in the <b>Start after text</b> or the <b>End before text</b> field are available in the source string.</li> <li><b>AND</b>: Select to extract text if both the values specified in the <b>Start after text</b> and the <b>End before text</b> fields are available in the source string.</li> </ul> </li> <li>In the <b>End before text</b> field, specify a string to use as the endpoint for extracting the text.</li> <li>In the <b>Occurrence</b> field, enter a value to specify the number of occurrences of the string you have provided in the <b>End before text</b> field.</li> </ol> <p>For example, if the source string is <code>This is a test string which is used to extract specific substring and you want to extract the entire text before specific</code>. To extract the required text, you must enter <code>specific</code> in the <b>End before text</b> field and <code>1</code> in the <b>Occurrence</b> field. This indicates to the system to extract the text available before the first occurrence of <code>specific</code> in the source string.</p>
<b>After</b>	<p>Extracts the entire text preceding the value you have provided in the <b>End before text</b> field.</p> <ol style="list-style-type: none"> <li>In the <b>End before text</b> field, specify a string to use as the endpoint for extracting the text.</li> <li>In the <b>Occurrence</b> field, enter a value to specify the number of occurrences of the string you have provided in the <b>End before text</b> field.</li> </ol> <p>For example, if the source string is <code>This is a test string which is used to extract specific substring and you want to extract the entire text before specific</code>. To extract the required text, you must enter <code>specific</code> in the <b>End before text</b> field and <code>1</code> in the <b>Occurrence</b> field. This indicates to the system to extract the text available before the first occurrence of <code>specific</code> in the source string.</p>

- In the **If no match found, return** field, select one of the options:
  - Source String**: Return the source string.
  - Empty (null) String**: Return the null string if no match is found.
- In the **Number of characters to get** field, select one of the options:
  - All**: Extracts all characters from the source string.
  - Only**: Specify the number of characters to extract from the source string.

6. In the **Trim the extracted text (remove blank spaces)** check box, select to remove blank spaces from the extracted text.
7. In the **Remove Enter from the extracted text** check box, select to remove carriage returns from the extracted text.
8. In the **Assign the output to variable** list, specify the variable.
9. Click **Save**.

## Using Find action

Use the **Find** action to find a substring within the specified string.

This action also enables you to perform a search based on a regular expression. A regular expression is a sequence of characters that define a search pattern. For example, to find all email addresses in the source string, specify the following as a regular expression: `\b[A-Z0-9._%~]+@[A-Z0-9.-]+\.[A-Z]{2,4}\b`.

---

**Note:** To search for strings that contain the dollar sign (\$), you must enter the sign twice. Otherwise, the bot interprets the dollar sign as a regular expression character.

---

To find a substring from the specified string, follow these steps:

1. In the **Actions** palette, double-click or drag the **Find** action from the **String** package.
2. In the **Source string** field, specify the source string.
3. In the **Find string** field, specify the substring.
4. In the **When finding** field, select one of the options:
  - **Match case:** Matches the case of the text.
  - **Do not match case:** Does not match the case of the text.
5. In the **The "find string" is** field, select one of the options:
  - **A regular expression:** The substring is a regular expression
  - **Not a regular expression:** The substring is not a regular expression.
6. Optional: In the **Start from** field, specify the starting point.  
For example, you want to replace `Red` in the source string with `Blue` in a paragraph. `Red` is in 10 instances in the paragraph and you want to replace only the third occurrence. Enter 3 in the **Start from** field to identify the third occurrence.
7. In the **Assign the output to variable** list, specify the number variable.
8. Click **Save**.

## Using Replace action

Use the **Replace** action to find a piece of text from the source string and replace it with another text.

A regular expression is a sequence of characters that define a search pattern. For example, to find all email addresses in the source string, specify the following as a regular expression: `\b[A-Z0-9._%~]+@[A-Z0-9.-]+\.[A-Z]{2,4}\b`.

To replace text from the specified string, follow these steps:

1. In the **Actions** palette, double-click or drag the **Replace** action from the **String** package.
2. In the **Source string** field, specify the source string.
3. In the **Find string** field, specify the substring.
4. In the **When finding** field, select one of the options:
  - **Match case:** Matches the case of the text.

- **Do not match case:** Does not match the case of the text.
5. In the **The "find string" is** field, select one of the options:
    - **A regular expression:** The substring is a regular expression
    - **Not a regular expression:** The substring is not a regular expression.
  6. Optional: In the **Start from** field, specify the starting position.  
The action then starts from the value you specify in this field. For example, if you specify 5 in the **Start from** field for the source string "Big blue ocean", when the bot runs, the action ignores the four preceding characters ("Big", including the space character) and searches for the substring in "blue ocean".
  7. Optional: In the **Count** field, specify the number of times the found string must be replaced.  
For example, in the source string "Big blue ocean, blue fish, blue sky", you want to replace the first two instances of "blue" with "green". Enter 2 in the **Count** field, 5 in the **Start from** field, and `green` in the **Replace with** field. When the bot runs, the action produces the output `green ocean, green fish, blue sky`.
  8. In the **Replace with** field, specify the text to replace the string.
  9. In the **Assign the output to variable** list, specify the variable that will hold the new string.
  10. Click **Save**.

## Using Split action

Use the **Split** action to split the specified string into multiple strings and store the output in a list variable.

To split a string into multiple strings, perform these steps:

1. In the **Actions** palette, double-click or drag the **Split** action from the **String** package.
2. In the **Source string** field, specify the source string.
3. In the **Delimiter** field, specify the character to split the string.  
For example, comma (,), semicolon (;), pipe (|), slash (/ \), newline character (\n), or space.  
In the delimiter text box, the newline character is not accepted for the Enter key as a line break. In that case, you can either press **F2** and select **Enter - String** from String section or input the `String:Enter` variable.
4. In the **Delimiter is** field, select one of the options:
  - **Case sensitive:** The delimiter is case-sensitive.
  - **Not case sensitive:** The delimiter is not case-sensitive.
5. In the **Split into substrings** field, select one of the options:
  - **All possible:** Splits the source string into as many substrings as possible.  
For example, if the original string is a,b,c,d, each character becomes a substring.
  - **Only:** Limits the number of substrings.  
For example, if the original string is a,b,c,d, and you enter 3, the output is three strings: a, b, and c,d.
6. In the **Assign the output to variable** list, specify the list variable.
7. Click **Save**.

## System package

Use the actions in the **System** package to automate locking, logging off, restarting, and shutting down the computer. Use these actions at the end of a task.

The **System** package includes the following actions:

Action	Description
Get environment variable	See <a href="#">Environment variables for System package</a>
Lock computer	Locks the computer.
Logoff	Logs the user off the computer.
Restart	Restarts the computer.
Shutdown	Shuts down the computer.

### Related tasks

#### [Using Log To File action](#)

Using the Log To File action, you can create a log file with data about the events that occur when a TaskBot runs.

### Related reference

#### [Application package](#)

Use the **Open Program/File** action in the **Application** package to launch an application or a file. This action supports .exe, .bat, script files, or shortcut paths.

## Environment variables for System package

Select from the list of variables in the **Get environment variable** action to return the system parameters of the device on which a bot is running.

Variable	Description	Example value
ALLUSERSPROFILE	Returns the path to the directory that contains resources and settings used by all system accounts.  <b>Note:</b> Use <i>ProgramData</i> for devices that run Windows Vista and later OS.	C:\ProgramData
APPDATA	Returns the file path to the application data directory. This directory contains the settings for applications shared across multiple devices.	C:\Users\ <i>&lt;user&gt;</i> \AppData\Roaming
COMPUTERNAME	Returns the device name without the domain.	AA-NY-FRANKSINATRA
CommonProgramFiles	Returns the file path to the <i>Common Files</i> directory.	C:\Program Files \Common Files

Variable	Description	Example value
CommonProgramFiles(x86)	Returns the file path to the <code>Common Files</code> directory.  <b>Note:</b> This is only available for devices that run 64-bit version.	C:\Program Files (x86)\Common Files
CommonProgramW6432	Returns the file path to the <code>Common Files</code> directory.  <b>Note:</b> <ul style="list-style-type: none"> <li>This is only available for devices that run 64-bit version.</li> <li>Only use <code>CommonProgramW6432</code> for devices that run Windows Vista and later OS</li> </ul>	C:\Program Files\Common Files
ComSpec	Returns the file path to the command processor	C:\Windows\system32\cmd.exe
DriverData	Returns the file path to the <code>Driver Data</code> directory.	C:\Windows\System32\Drivers\DriverData
HOMEDRIVE	Returns the home drive of the device.	C:
HOMEPATH	Returns the hompath of the device without the system drive.	\Users\ <user&gt;< td=""> </user&gt;<>
LOCALAPPDATA	Returns the file path to the application data directory. This directory contains the settings for applications shared across multiple devices.	C:\Users\ <user&gt;\appdata\local< td=""> </user&gt;\appdata\local<>
LOGONSERVER	Returns the name of the group or domain to which the device is connected	\\SJC SRV BKP
NUMBER_OF_PROCESSORS	Returns the number of processors in the device.	4
OneDrive	Returns the path to the OneDrive folder.	C:\Users\ <user&gt;\onedrive< td=""> </user&gt;\onedrive<>
OS	Returns the device operating system name.	Windows_NT
Path	Returns a semicolon-delimited list of directories that contain executable programs.	C:\Windows\system32;C:\Windows;C:\Windows\System32\Wbem;C:\Windows\System32\WindowsPowerShell\v1.0\
PATHEXT	Returns a semicolon-delimited list of file extensions that the system can execute.	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;....

Variable	Description	Example value
PROCESSOR_ARCHITECTURE	Returns the process architecture of the device.	AMD64
ProgramData	Returns the path to the directory that contains resources and settings used by all system accounts.  <b>Note:</b> Use <i>ALLUSERSPROFILE</i> for devices that run the Windows XP and earlier OS.	C:\ProgramData
ProgramFiles	Returns the path to the directory that stores installed programs.	C:\Program Files
ProgramFiles(x86)	Returns the path to the directory that stores installed programs.  <b>Note:</b> This is only available for devices that run 64-bit version.	C:\Program Files (x86)
ProgramW6432	Returns the path to the directory that stores installed programs.	C:\Program Files
PSModulePath	Returns file paths to the modules that are installed on the disk.	%ProgramFiles%\WindowsPowerShell\Modules;C:\Windows\system32\WindowsPowerShell\v1.0\Modules
PUBLIC	Returns the <code>Public</code> folder path.	C:\Users\Public
SystemDrive	Returns the device system drive.	C:
SystemRoot	Returns the system root folder.	C:\Windows
TMP	Returns the path to the directory that stores temporary files.	C:\Users\ <user>\AppData\Local\Temp</user>
TEMP	Returns the path to the directory that stores temporary files.	C:\Users\ <user>\AppData\Local\Temp</user>
USERDNSDOMAIN	Returns the DNS domain of the user.	AAI.AASPL-BRD.COM
USERDOMAIN	Returns the domain of the user.	AAI.AASPL-BRD.COM
USERDOMAIN_ROAMINGPROFILE	Returns the domain of the user profile.	AAI
USERNAME	Returns the logged-in user name.	bob.ross
USERPROFILE	Returns the user profile path.	C:\Users\ <user></user>
windir	Returns the Windows directory path.	C:\Windows

## Task Bot package

Use the **Run**, **Pause**, and **Stop** actions in the Task Bot package to manage running one or more child bots from a parent bot or with a third-party software using an API.

Build smaller bots that automate a single task and run them from a parent bot. For example, build a `Login` child bot to enter the username and password into a web form and click submit. The `Login` child bot accepts credentials from the parent bot and returns a success message, and then the parent bot can call the subsequent `CreateInvoice` child bot. The `Login` child bot should also contain error handling logic in case the credentials are incorrect.

This practice of building smaller, self-contained bots enables a user to reuse the bot logic in a greater number of tasks, and makes error handling and troubleshooting easier. This also decreases the amount of time spent building and maintaining bots. As a result, an organization is able to rapidly scale their automation initiatives. The `Login` child bot from this example can be reused in any task that involves providing credentials to a login page on a website.

---

### Note:

- CSV/text file and Recorder sessions cannot be shared across bots. You can share Excel sessions across bots by using a session variable. See [Example of sharing an Excel session between bots](#).
- When you use a file type variable in the Run Task, ensure you have set the default value in the variable. Without default value, the bot displays an error on execution.

---

In addition, running child bots from a parent bot offers greater control over data in the following ways:

- Users can configure the variables to control the direction in which information can be exchanged by selecting from the following options:
  - **Use as input:** The variable holds a value that can be passed from a parent bot or third-party software to a child bot.
  - **Use as output:** The variable holds a value that can be passed from a child bot to the parent bot or third-party software.
  - **Both:** The value can be passed in both directions.
  - **Neither:** The variable is confined to this bot; it cannot be shared across other bots.

See [Create a variable](#)

- Other users can reuse child bots without viewing their contents.

The **Task Bot** package includes the following actions:

Action	Description
Pause	Temporarily pauses the running bot. Use the <b>Pause</b> action to modify data or to verify the status of a relevant component.  When the bot reaches the <b>Pause</b> action during run time, a <b>Resume</b> button appears. You must click <b>Resume</b> for the bot to continue to the next action.

Action	Description
Run	<p>Runs the selected task multiple times for a specified number of times or for a number of hours. The task can be repeated until the user chooses to stop it. You can save the output values to a dictionary variable, where each key in the dictionary is the variable name and corresponding value from the child bot. Or, you can map each dictionary key to a variable to store the corresponding value.</p> <hr/> <p><b>Note:</b> When you create a TaskBot with dependencies, ensure that the both the parent and child bot are in the same workspace (public or private). You cannot call a public bot from a private bot. To do so, you should first either check-out or clone the public bot into the private workspace and then check-in both the bots to the public workspace.</p> <hr/> <p>See <a href="#">Using the Run action</a>.</p> <p>For an example, see <a href="#">Example of using the Run action</a>.</p>
Stop	<p>Stops the running bot.</p> <p>For example, use the <b>Stop</b> action to terminate the bot if a condition is met, such as if the bot encounters a file larger than 100 MB.</p>

## Using the Run action

The **Run** action from the TaskBot package enables you to run one or more child bots. Configure the action to run the child bots repeatedly or with a delay, and to pass and retrieve values.

1. In the **Actions** palette, double-click or drag the **Run** action from the **Task Bot** package.
2. In the **Task Bot to run** field, select the child bot:

Option	Description
<b>Current Task Bot</b>	Runs the current bot recursively.

Option	Description
<b>Control Room file</b>	<p>Click <b>Browse</b> and select a bot from your private workspace.</p> <p>The system shows suggestions from the bots available in the private repository when you start typing the name of the bot you want to run. The location of the selected bot in the private repository is also displayed.</p> <p>Select a bot that you want to run:</p> <ul style="list-style-type: none"> <li>Click the <b>Browse</b> tab if you want to select a bot from your private workspace. <p>The location of the selected bot in the private repository is also displayed.</p> </li> <li>Click the <b>Search</b> tab if you want to search for a bot from the public workspace and your private workspace. <p>Suggestions about the bots available in the public and private workspaces are displayed when you start typing the name of the bot you want to run. The location of the selected bot in the public and the private workspaces is also displayed.</p> </li> </ul>
<b>Variable</b>	<p>Select from the following options:</p> <ul style="list-style-type: none"> <li><b>File:</b> Insert a file variable that contains a bot.</li> <li><b>Control Room path:</b> Enter an expression beginning with <code>Bots</code> that contains a string variable to specify the bot. For example <code>Bots/\$department\$/PTOReport</code>.</li> </ul> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>The file path is case-sensitive.</li> <li>The bot must be in the same workspace as the parent bot.</li> </ul> <hr/>

3. In the **Input values** fields, enter the values or variables to pass to the child bot:
  - a) Select an input variable to activate the text field.
  - b) Enter a value of the required data type.

The icon on the left-side of the text field indicates the data type.

If you are configuring a bot with many input variables, use the **Quick map** option to automatically map variables that share the same name and data type. If the child bot contains variables for which there are no corresponding variables in the parent bot, the **Quick map** option creates new variables and maps them.

4. Optional: Select the repetition.
5. Optional: Select the **Delay between repetitions** option and enter the delay time in the **Minutes** and **Seconds** fields.

6. Optional: Select the **Upon error, start next repetition** option.  
For alternative error-handling options, use actions from the Error handler package.

*Error handler package*

7. In the **Save outcome to a variable** field, select either the **Multiple variables** or **Dictionary** option:

Option	Description
<b>Multiple variables</b>	Click <b>Add variable mapping</b> to associate each dictionary key with a variable in the parent bot.  Use this option if you do not want to use actions to extract the dictionary values.
<b>Dictionary</b>	Insert or create a dictionary variable to hold the output variables and values in key-value pairs.  Each key in the dictionary is the variable name and corresponding value from the child bot.

8. Click **Save**.

For an example of using this action:

- *Example of using the Run action*
- *Example of sharing an Excel session between bots*

## Example of sharing an Excel session between bots

Build two bots to update the employee salaries in a worksheet. In this example, one bot opens an Excel worksheet and passes the session name as a variable to the second bot, which iterates through the worksheet, calculates each employee's new salary, and updates the value in the worksheet.

Create a worksheet with the following data:

Employee ID	Start date	Salary
200	1/12/2020	50000
233	3/15/2018	75000
500	6/6/2020	60000
555	7/9/2019	65000

Build the child to iterate through the table of employees and update each salary to reflect the raise.

1. Open a new bot.
  - a) From Automation Anywhere web interface, select **Bots > My bots**.
  - b) Click **Create a bot**.
  - c) Enter the bot name `RaiseSalaries`.
  - d) Enter the folder location `\Bots\TaskBotExample`.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and Edit**.
2. Create the following variables:

- `sessionVariable`: session type; MS Excel subtype; use as input
  - `sCellAddress`: string type; default value of C2
  - `sSalary`: string type
  - `nSalary`: number type
3. Use a **Loop** action to iterate through all the rows in the worksheet.
    - a) Double-click or drag the **Loop** action.
    - b) Select the **For each row in worksheet** iterator.
    - c) Select the **Shared session** tab and insert `$sessionVariable$`.
    - d) Select the **Read cell value** option.
    - e) In the **Assign the current value to this variable** field, create a record variable.
  4. Retrieve the employee's salary.
    - a) Drag into the Loop container the **Excel Advanced > Get single cell** action.
    - b) Select the **Shared session** tab and insert `$sessionVariable$`.
    - c) Select the **Specific cell** option and insert `$sCellAddress$`.
    - d) Select the **Read cell value** option.
    - e) In the **Store cell contents to** field, insert `$sSalary$`.
  5. Convert the salary value to a number data type.
    - a) Drag into the Loop container the **String > To number** action.
    - b) In the **Enter the string** field, insert `$sSalary$`.
    - c) In the **Assign the output to variable** field, insert `$nSalary$`.
  6. Calculate the new salary to be five percent greater than the current salary.
    - a) Drag into the Loop container the **Number > Assign** action.
    - b) In the **Select source variable** field, enter `$nSalary$*1.05`.
    - c) In the **Select destination variable** field, insert `$nSalary$`.
  7. Update the salary in the worksheet.
    - a) Drag into the Loop container the **Excel Advanced > Set cell** action.
    - b) Select the **Shared session** tab and insert `$sessionVariable$`.
    - c) Select the **Specific cell** option and insert `$sCellAddress$`.
    - d) In the **Cell value** field enter `$nSalary.Number:toString$`.

---

**Note:** You must convert the value to a string data type before the bot can enter it into the worksheet. Use type casting as an alternative to the **Number > To string** action. *Type casting*

---

8. Move the cursor down by a single cell and assign that cell address to `sCellAddress`.
  - a) Drag into the Loop container the **Excel Advanced** > **Go to cell** action.
  - b) Select the **Shared session** tab and insert `$sessionVariable$`.
  - c) Select the **Active cell** and **One cell below** options.
  - d) Drag into the Loop container the **Excel Advanced** > **Get cell address** action.
  - e) Select the **Shared session** tab and insert `$sessionVariable$`.
  - f) Select the **Active cell** option.
  - g) In the **Save active cell address** field, insert `$sCellAddress$`.
9. Click **Save** and **Close**.  
Build the parent bot.
10. Open a new bot.
  - a) Click **Create a bot**.
  - b) Enter the bot name `ExcelParentBot`.
  - c) Enter the folder location `\Bots\TaskBotExample`.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - d) Click **Create and Edit**.
11. Create the following variable:  
`sessionVariable: session type; MS Excel subtype`
12. Open the Excel worksheet.
  - a) Double-click or drag the **Excel Advanced** > **Open** action.
  - b) In the **Session name** field, enter `Session1`.
  - c) In the **File path** field, enter the file path to the worksheet you created above.
  - d) Select the **Sheet contains header** option.
13. Assign the session to a variable.
  - a) Double-click or drag the **Excel Advanced** > **Set session variable** action.
  - b) In the **Session name** field, enter `Session1`.
  - c) In the **Save session to a variable** field, select `$sessionVariable$`.
14. Select the child bot you built in the above.
  - a) Double-click or drag the **Task Bot** > **Run** action.
  - b) Click the **Control Room file** option and click **Browse** to select the `RaiseSalaries` bot.
  - c) In the **Input values** section, select the **Set SessionVariable** option and insert `$sessionVariable$`.
15. Click **Save** and **Run**.  
The Excel worksheet opens and the value of each cell in the third column increases by five percent.

## Terminal Emulator package

The **Terminal Emulator** package contains actions that enable you to connect to and automate tasks on another machine. Use these actions to access and control operations on a remote machine. For example, you can run applications and access files on a different operating system.

The Terminal Emulator enables a machine to connect to and communicate with another machine using a command-line or graphical interface. The Terminal Emulator uses the Telnet or SSH protocol to communicate with other machines.

The Terminal Emulator supports ANSI, TN3270E, TN5250E, and VT100 terminal types.

### Before you start

Perform the following actions within the **Terminal Emulator** package as part of using the set of available actions:

1. Establish a connection with a host machine using the **Connect** action.

You must first establish a connection with a host machine to automate any Terminal Emulator related task. When establishing the connection, specify the details of the host machine and associate it with a session name. Use the session name provided in this action in the other actions so that you do not have to provide details of the host machine in those actions again. See [Using the Connect action](#).

---

**Important:** If you use any other action from this package before establishing the connection, you will encounter an error.

---

2. Use the Terminal Emulator actions to automate a task. For example, use the **Get field** action to retrieve the value from a particular field.
3. After you have automated all the Terminal Emulator related tasks, terminate the connection to the host machine using the **Disconnect** action.

### Actions in the **Terminal Emulator** package

The **Terminal Emulator** package includes the following actions:

Action	Description
Clear terminal	Clears the screen of the terminal. Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.
Connect	See <a href="#">Using the Connect action</a> .
Disconnect	Terminates the connection with the terminal. Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.

Action	Description
Get all fields	<p>Retrieves the values of all fields and assigns them to a table variable.</p> <ul style="list-style-type: none"> <li>Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.</li> <li>Select a table variable to store the retrieved data from the <b>Assign the value to an existing table variable</b> list. The table stores each field as a row, with the values of each field organized in the following columns: <ul style="list-style-type: none"> <li>Field index</li> <li>Field name</li> <li>Field value</li> <li>Is Editable (yes/no)</li> <li>Is Hidden (yes/no)</li> </ul> </li> </ul> <hr/> <p><b>Note:</b> You can use this action with the TN3270E and TN5250E terminal types.</p>
Get field	<p>Retrieves the value of a field based on the index or name of the field and assigns it to a string variable.</p> <ul style="list-style-type: none"> <li>Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.</li> <li>Select the <b>By index</b> option to retrieve the value of a field based on its index, or select the <b>By name</b> option to retrieve the value of a field based on its name.</li> <li>Select a string variable to store the retrieved data from the <b>Assign the value to an existing variable</b> list.</li> </ul> <hr/> <p><b>Note:</b> You can use this action with the TN3270E and TN5250E terminal types.</p>
Get text	See <a href="#">Using Get text action</a> .
Hide terminal	<p>Hides the terminal screen. This action enables you to hide the terminal screen when the <b>Show terminal window</b> option from the <b>Connect</b> action is selected. It is useful when you do not want to display the terminal screen when a bot is performing certain tasks. Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.</p>

Action	Description
Search field	<p>Searches for the field based on the text it contains.</p> <ul style="list-style-type: none"> <li>From the <b>Terminal emulator session name</b> field, choose one of the following options: <ul style="list-style-type: none"> <li><b>Local name</b> to establish a connection with the terminal using the <b>Connect</b> action</li> <li><b>Shared session</b> to share the variable from <b>Set session variable</b> or from the parent bot</li> </ul> </li> <li>Specify the text based on which you want to search the field.</li> <li>Select an option from <b>Select field</b> to specify whether to retrieve the index or name of the field.</li> <li>Assign and save the output to a variable.</li> </ul> <hr/> <p><b>Note:</b> The search text you enter must be a complete match and is not case-sensitive.</p> <hr/>
Send key	See <a href="#">Using Send key action.</a>
Send text	See <a href="#">Using Send text action.</a>
Set cursor position	<p>Sets the position of the cursor on the screen of the terminal.</p> <ul style="list-style-type: none"> <li>Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.</li> <li>Specify the row number in which to set the cursor in the <b>Set row</b> field.</li> <li>Specify the column number in which to set the cursor in the <b>Set column</b> field.</li> </ul> <hr/> <p><b>Note:</b> You can enter a value of 1 through 999 to specify the row and column number where the cursor is set.</p> <hr/>
Set field	See <a href="#">Using Set field action.</a>
Set session variable	Assign the session name to a variable. Pass this session variable from the parent bot to a child bot by entering the variable as an input type variable in the child bot.
Show terminal	Shows the terminal screen. This action enables you to show the terminal screen when the <b>Show terminal window</b> option from the <b>Connect</b> action is not selected. It is useful when you want to display the terminal screen when a bot is performing certain tasks. You must specify Specify the <b>Terminal emulator session name</b> that you used to establish a connection with the terminal using the <b>Connect</b> action.
Wait	See <a href="#">Using Wait action.</a>

## Using the Connect action

Use the **Connect** action to establish a connection with a host machine on which you want to automate a task. You can use this action to establish a connection with the TN3270E, TN5250E, ANSI, VT220, and VT100 terminal types.

This action enables you to specify the details of the host machine and associate it with a session name. Use the session name provided in this action in the other actions, so that you do not have to provide details of the host machine in those actions again.

---

**Important:** If you use any other action from this package before establishing the connection, you will encounter an error.

---

To establish a connection with a host machine, perform the following steps:

1. Double-click or drag the **Connect** action from the **Terminal Emulator** node in the **Actions** palette.
2. Specify a name for the session in the **Terminal emulator session name** field.
3. Specify the **Host name** of the machine you want to connect to:
  - a) Click the **Credential** tab to select an entry from the Credential Vault.
  - b) Click the **Variable** tab to use a variable to specify the host name.
4. Enter a value in the **Port** field to specify the port you want to use to connect to the host.
5. Select one of the following options to specify the terminal type:

Option	Steps
<b>ANSI</b>	<p>Select an option from the <b>Connection type</b> list to specify the type of connection you want to establish:</p> <ul style="list-style-type: none"> <li>• <b>Telnet</b></li> <li>• <b>SSH2</b></li> </ul> <p>For <b>SSH2</b> connection type:</p> <ul style="list-style-type: none"> <li>• For <b>User authentication</b>:           <ul style="list-style-type: none"> <li>• <b>User name</b>: Click the <b>Credential</b> tab to select an entry from the Credential Vault. You can also click the <b>String</b> tab to enter a value manually.</li> <li>• For <b>Password</b>: Click the <b>Credential</b> tab to select an entry from the Credential Vault. You can also click the <b>String</b> tab to enter a value manually.</li> </ul> </li> <li>• For <b>Key file authentication</b>: Click one of the following options to specify the location of the file:           <ul style="list-style-type: none"> <li>• <b>Control Room file</b>: Enables you to select a PDF file that is available in a folder.</li> <li>• <b>Desktop profile</b>: Enables you to select a PDF file that is available on your device.</li> <li>• <b>Variable</b>: Enables you to specify the file variable that contains the location of the PDF file.</li> </ul> </li> <li>• For <b>User name</b>: Click the <b>Credential</b> tab to select an entry from the Credential Vault. You can also click the <b>String</b> tab to enter a value manually.</li> </ul>

Option	Steps
<b>TN3270E</b>	<p><b>a.</b> Select an option from the <b>Host name security</b> list to specify the security you want to use:</p> <ul style="list-style-type: none"> <li>• <b>NONE</b></li> <li>• <b>SSL</b></li> <li>• <b>TLS</b></li> </ul> <p><b>b.</b> Select the <b>Enable TN3270E support</b> check box if you want to choose a connection method.</p> <p>Select an option from the <b>Connection method</b> list:</p> <ul style="list-style-type: none"> <li>• <b>GENERIC:</b> Enables you to specify the <b>Device name</b>.</li> <li>• <b>SPECIFIC:</b> Enables you to specify the <b>Device name</b> and <b>Resource (LU) Name</b>.</li> </ul> <p><b>c.</b> Select an option from the <b>Terminal model</b> list to specify the terminal workstation you want to connect to.</p> <p><b>d.</b> Select an option from the <b>Code page</b> list to specify the encoding you want to use for the terminal.</p>
<b>TN5250E</b>	<p><b>a.</b> Select an option from the <b>Host name security</b> list to specify the security you want to use:</p> <ul style="list-style-type: none"> <li>• <b>NONE</b></li> <li>• <b>SSL</b></li> <li>• <b>TLS</b></li> </ul> <p><b>b.</b> Select the <b>Enable TN5250E support</b> check box if you want to specify details about the device and resource.</p> <p>Enter a value in the <b>Device name</b> and <b>Resource (LU) Name</b> fields.</p> <p><b>c.</b> Select an option from the <b>Terminal model</b> list to specify the terminal workstation you want to connect to.</p> <p><b>d.</b> Select an option from the <b>Code page</b> list to specify the encoding you want to use for the terminal.</p>

Option	Steps
<b>VT Series</b> <ul style="list-style-type: none"> <li>• <b>VT100</b></li> <li>• <b>VT220</b></li> </ul>	<ol style="list-style-type: none"> <li>a. Select an option from the <b>Terminal model</b> list to specify the terminal type you want to connect to.</li> <li>b. Select an option from the <b>Encoding</b> list to specify the encoding you want to use for the terminal: <ul style="list-style-type: none"> <li>• ANSI</li> <li>• DBCS</li> <li>• UTF-8</li> </ul> <p>The <b>CodePage</b> field appears when DBCS option is selected. The CodePage supports only Japanese Shift-JIS (932).</p> </li> <li>c. Select an option from the <b>Connection type</b> list to specify the type of connection you want to establish: <ul style="list-style-type: none"> <li>• <b>Telnet</b></li> <li>• <b>SSH2</b></li> </ul> <p>For <b>SSH2</b> connection type:</p> <ul style="list-style-type: none"> <li>• For <b>User authentication</b>: <ul style="list-style-type: none"> <li>• <b>User name</b>: Click the <b>Credential</b> tab to select an entry from the Credential Vault. You can also click the <b>String</b> tab to enter a value manually.</li> <li>• For <b>Password</b>: Click the <b>Credential</b> tab to select an entry from the Credential Vault. You can also click the <b>String</b> tab to enter a value manually.</li> </ul> </li> <li>• For <b>Key file authentication</b>: Click one of the following options to specify the location of the file: <ul style="list-style-type: none"> <li>• <b>Control Room file</b>: Enables you to select a PDF file that is available in a folder.</li> <li>• <b>Desktop profile</b>: Enables you to select a PDF file that is available on your device.</li> <li>• <b>Variable</b>: Enables you to specify the file variable that contains the location of the PDF file.</li> </ul> </li> <li>• For <b>User name</b>: Click the <b>Credential</b> tab to select an entry from the Credential Vault. You can also click the <b>String</b> tab to enter a value manually.</li> </ul> </li> </ol>

6. Select the **Show terminal window** check box to show the terminal window when the bot runs this action.
7. Select the **Wait for the terminal prompt to appear while connected** check box to wait for the terminal prompt to appear on the screen of the terminal after the connection is established.
  - a) Enter the text you want to display when you connect to the terminal in the **Terminal prompt** field.
  - b) Enter a value in the **Wait time out** field to specify the period in (milliseconds) the system must wait before the connection request is timed out.
8. In the **Assign value to variable** list, select a string variable.

## Using Get text action

Use the **Get text** action to retrieve text from the terminal and store it in a string variable. This action enables you to retrieve text from the last line, all lines, or a range of lines. You can use this action with the TN3270E, TN5250E, ANSI, and VT100 terminal types.

To retrieve text from the terminal, do the following:

1. Double-click or drag the **Get text** action from the **Terminal Emulator** node in the **Actions** palette.
2. Enter the name of the session that you have used to establish a connection with the terminal using the **Connect** action in the **Terminal emulator session name** field.
3. Select an option from the **Get text** list to specify the lines from which you want to retrieve text:
  - **Last line:** Retrieves text from the last line of the terminal.
  - **All lines:** Retrieves text from all lines of the terminal.
  - **Lines from-to:** Retrieves text from the specified range of lines of the terminal. You must enter values in the **Start row** and **End row** fields to specify the range.

---

**Note:** You can specify a value of 1 through 999.

---

4. Select a string variable from the **Assign the value to an existing variable** list to assign the retrieved text to that variable.
5. In the **Assign value to variable** list, select a string variable.

## Using Send key action

Use the **Send key** action to send a key to the terminal. You can use these keys to perform various operations on the terminal. You can use this action with the TN3270E, TN5250E, ANSI, and VT100 terminal types.

To send a key to the terminal, do the following:

1. Double-click or drag the **Send key** action from the **Terminal Emulator** node in the **Actions** palette.
2. Enter the name of the session that you have used to establish a connection with the terminal using the **Connect** action in the **Terminal emulator session name** field.
3. Select an option from the **Select key to be send** list to specify the key you want to send.
4. Enter a value in the **Delay after send key command** field to specify the period the system must wait (in milliseconds) after the selected key is sent.
5. Select the **Wait for text or prompt to appear** check box if you want the system to wait for the prompt or certain text to appear on the terminal.
  - a) Select the **Prompt** option if you want the system to wait till the prompt appears on the terminal.
  - b) Select the **Text** option if you want the system to wait till the specific text appears on the terminal. You must provide the text you want to appear on the terminal in the **Text value to be appear on screen** field.
  - c) Select the **Wait before send key for prompt or text appear** check box if you want the system to wait for the prompt or the specified text to appear on the terminal before sending the selected key.
  - d) Select the **Wait after send key for prompt or text appear** check box if you want the system to wait for the prompt or the specified text to appear on the terminal after sending the selected key.
  - e) Enter a value in the **Time out for prompt or text to appear** field to specify the period (in seconds) the system must wait before the operation times out.

6. In the **Assign value to variable** list, select a string variable.

*How send key works in Send text action*

Learn how keys work in the **Send Text** action in the Terminal Emulator.

**Note:** Behavior of the keys that are marked with the asterisk (\*) sign in the following tables is defined by the terminal host. The behavior might vary on different terminals.

The following table shows the behavior of the keys in the terminal types TN3270 and TN5250:

Keys	Behavior
KEY_BACKSPACE	Same behavior as the Backspace key on the keyboard.
KEY_BACKTAB	If the cursor is on the first position of a field, it moves to the previous field. Otherwise, it moves to the start of the current field.
KEY_CLEAR	Clears the entire text on the terminal screen.
KEY_ERASEINPUT	Deletes all the text in the field.
KEY_NEXTFIELD	Moves the cursor to the next field on the terminal screen.
KEY_ENTER	Sends Enter key to the terminal host.
KEY_HOME	Moves the cursor to the first editable field on the screen.
KEY_RESET	The reset key only clears the Keyboard lock, such as releasing the terminal if the terminal screen is not working. The screen text and input field values remain the same.
KEY_LEFT	Moves the cursor to the left by one position.
KEY_RIGHT	Moves the cursor to the right by one position.
KEY_UP	Moves the cursor up by one position.
KEY_DOWN	Moves the cursor down by one position.
KEY_PGLEFT	Nothing happens.
KEY_PGRIGHT	Nothing happens.
KEY_PGUP	Page Up key
KEY_PGDOWN	Page Down key
KEY_TABFORWARD	Performs a tab key action on the terminal screen to move the cursor to the next field.
KEY_PF1 *	Same behavior as F1 key on the keyboard.
KEY_PF2 *	Same behavior as F2 key on the keyboard.
KEY_PF3 *	Same behavior as F3 key on the keyboard.
KEY_PF4 *	Same behavior as F4 key on the keyboard.
KEY_PF5 *	Same behavior as F5 key on the keyboard.
KEY_PF6 *	Same behavior as F6 key on the keyboard.
KEY_PF7 *	Same behavior as F7 key on the keyboard.
KEY_PF8 *	Same behavior as F8 key on the keyboard.

Keys	Behavior
KEY_PF9 *	Same behavior as F9 key on the keyboard.
KEY_PF10 *	Same behavior as F10 key on the keyboard.
KEY_PF11 *	Same behavior as F11 key on the keyboard.
KEY_PF12 *	Same behavior as F12 key on the keyboard
KEY_PF13 *	Same behavior as Shift + F1 keys on the keyboard.
KEY_PF14 *	Same behavior as Shift + F2 keys on the keyboard.
KEY_PF15 *	Same behavior as Shift + F3 keys on the keyboard.
KEY_PF16 *	Same behavior as Shift + F4 keys on the keyboard.
KEY_PF17 *	Same behavior as Shift + F5 keys on the keyboard.
KEY_PF18 *	Same behavior as Shift + F6 keys on the keyboard.
KEY_PF19 *	Same behavior as Shift + F7 keys on the keyboard.
KEY_PF20 *	Same behavior as Shift + F8 keys on the keyboard.
KEY_PF21 *	Same behavior as Shift + F9 keys on the keyboard.
KEY_PF22 *	Same behavior as Shift + F10 keys on the keyboard.
KEY_PF23 *	Same behavior as Shift + F11 keys on the keyboard.
KEY_PF24 *	Same behavior as Shift + F12 keys on the keyboard.

## Using Send text action

Use the **Send text** action to send text to the terminal. This action also enables you to send predefined keys after the text to perform various operations in the terminal. You can use this action with the TN3270E, TN5250E, ANSI, and VT100 terminal types.

To send a text to the terminal, do the following:

1. Double-click or drag the **Send text** action from the **Terminal Emulator** node in the **Actions** palette.
2. Enter the name of the session that you have used to establish a connection with the terminal using the **Connect** action in the **Terminal emulator session name** field.
3. Specify the **Text** you want to send to the terminal:
  - a) Click the **Credential** tab to select an entry from the Credential Vault.
  - b) Click the **Variable** tab to use a variable that contains the text you want to send.
4. Select the **Send a key after sending the above text** check box if you want to send a key after sending the text.
  - a) Select the key you want to send from the list.
  - b) Enter a value in the **Delay after send key command** field to specify the period (in milliseconds) the system must wait after sending the selected key.

5. Select the **Wait for text or prompt to appear** check box if you want the system to wait for the prompt or certain text to appear on the terminal.
  - a) Select the **Prompt** option if you want the system to wait till the prompt appears on the terminal.
  - b) Select the **Text** option if you want the system to wait till the specific text appears on the terminal. You must provide the text you want to appear on the terminal in the **Text value to be appear on screen** field.
  - c) Select the **Wait before send key for prompt or text appear** check box if you want the system to wait for the prompt or the specified text to appear on the terminal before sending the selected key.
  - d) Select the **Wait after send key for prompt or text appear** check box if you want the system to wait for the prompt or the specified text to appear on the terminal after sending the selected key.
  - e) Enter a value in the **Time out for prompt or text to appear** field to specify the period (in seconds) the system must wait before the operation times out.
6. In the **Assign value to variable** list, select a string variable.

## Using Set field action

Use the **Set field** action to set a value in a particular field in the terminal. This action also enables you to send predefined keys after the value to perform various operations in the terminal. You can use this action with the TN3270E, TN5250E, ANSI, and VT100 terminal types.

To set a value for a field in the terminal, do the following:

1. Double-click or drag the **Set field** action from the **Terminal Emulator** node in the **Actions** palette.
2. Enter the name of the session that you have used to establish a connection with the terminal using the **Connect** action in the **Terminal emulator session name** field.
3. Specify the field for which you want to set a value:
  - a) Select the **By index** option to specify the field based on its index.  
The index value starts from zero and ends at 99999. For example, if you want to set the value for the third field, you must specify 2 in this field.
  - b) Select the **By name** option to specify the location of the field.  
For example, if you want to set the value for a field in the fifth column of the third row, you must specify `R3C5` in the field.
4. Specify the **Plain text value** you want to set in the specified field:
  - a) Click the **Credential** tab to select an entry from the Credential Vault.
  - b) Click the **Variable** tab to use a variable that contains the text you want to send.
5. Select the **Send enter key after setting field** check box if you want to send the enter key after setting the field.  
This option performs the operation similar to pressing the Enter key after setting the value in the field.
6. Select the **Send a key after sending the above text** check box if you want to send a key after sending the text.
  - a) Select the key you want to send from the list.
  - b) Enter a value in the **Delay after send key command** field to specify the period (in milliseconds) the system must wait after sending the selected key.

7. In the **Assign value to variable** list, select a string variable.

## Using Wait action

Use the **Wait** action to introduce a delay till specific conditions are met in the terminal. You can use this action to wait before executing the next action till the specific text appears on the screen, the cursor moves to the specified location, and so on. You can use this action with the TN3270E, TN5250E, ANSI, and VT100 terminal types.

To wait till specific conditions are met in the terminal, do the following:

1. Double-click or drag the **Wait** action from the **Terminal Emulator** node in the **Actions** palette.
2. Enter the name of the session that you have used to establish a connection with the terminal using the **Connect** action in the **Terminal emulator session name** field.
3. Select an option from the **Terminal event** list to specify a condition the system should wait till it is met.

The following table provides information about the options available in the list and the input required for each option:

Option	Input required
<b>Wait till text appears</b>	Waits till the text you have specified in the <b>Text</b> field appears on the screen of the terminal.
<b>Wait till text disappears</b>	Waits till the text you have specified in the <b>Text</b> field disappears from the screen of the terminal.
<b>Wait till cursor moves to position</b>	Waits till the cursor moves to the position you have specified in the <b>Move to row</b> and <b>Move to column</b> fields.  <b>Note:</b> You can enter a value of 1 through 999 to specify the row and column number where the cursor is set.
<b>Wait till cursor moves out of position</b>	Waits till the cursor moves out of the position you have specified in the <b>Move out of row</b> and <b>Move out of column</b> fields.  <b>Note:</b> You can enter a value of 1 through 999 to specify the row and column number where the cursor is set.
<b>Wait till screen gets blank</b>	No input required.
<b>Wait till screen contains text</b>	Waits till the text you have specified in the <b>Text</b> field is available on the screen of the terminal.
<b>Wait till terminal prompt appears</b>	No input required.
<b>Wait till terminal ready state</b>	No input required.

4. Enter a value in the **How long you would like to wait?** field to specify the period (in milliseconds) the system must wait before the operation times out.
5. In the **Assign value to variable** list, select a string variable.

## Share session between TaskBot logic

Use the **Shared Session** option in the Terminal Emulator package to pass the exact state of an application to the concurrently occurring TaskBot logic.

Shared session enables you to reuse actions between TaskBots that run concurrently, for example, connecting to the same application.

To use shared session, create a hierarchy of TaskBot logic that are connected by the **Shared Session** option. As a result, large TaskBot logic are trimmed by removing repetitive commands for connecting and disconnecting.

1. Create a parent bot such as TE\_Share\_Main that connects to an application on the Terminal Emulator.
2. Use the **Set session variable** action in the TE\_Share\_Main to assign the current session to a variable such as `$te_session$` of Terminal Emulator session type.
3. Create a child bot such as TE\_BMIS to perform any actions such as **Get text** and **Set field**.
4. Add a Run Task action in the TE\_Share\_Main to call the TE\_BMIS.
5. To pass a session variable from the TE\_Share\_Main to TE\_BMIS , select `$te_session$` as an input value in the **Set SessionVariable**.
6. In the TE\_BMIS , use **Shared session** tab and insert `$te_session$` as a session variable to obtain data or perform task.
7. In the main task, add an action to disconnect from the application.

## Trigger loop package

The **Trigger loop** package enables you to run a series of actions when a trigger event occurs. You can insert multiple trigger loops within a bot or nest one trigger loop within another trigger loop.

### Actions in the Trigger loop package

Action	Description
Trigger loop	<p>Opens the loop.</p> <hr/> <p><b>Note:</b> Events within the <b>Trigger loop</b> follow a sequential order and any parallel events that occur during this time are queued.</p> <hr/>
Handle	<p>Specifies the trigger event and runs the actions that are inside of the container when that event occurs. Drag this action to the right of the <b>Trigger loop</b> action (Flow view) or below the <b>Trigger loop</b> action (List view).</p>
Break	<p>Terminates the loop so that the bot continues with the actions below the loop. Drag this action inside of the <b>Trigger Handle</b> container.</p> <hr/> <p><b>Note:</b> You must close the loop with a Break action or else the bot will run indefinitely.</p> <hr/>

## Triggers in the Handle action

Trigger	Description	Options
Form	<p>Runs the actions when a form field is modified. Select an existing form and element.</p> <p><i>Using interactive forms</i></p>	<ul style="list-style-type: none"> <li>• <b>On click:</b> Button is clicked.</li> <li>• <b>Got focus:</b> Input field is clicked.</li> <li>• <b>Lost focus:</b> User leaves the input field.</li> <li>• <b>Changed value:</b> Check box or radio button status is changed.</li> <li>• <b>Value selected:</b> Check box is selected.</li> <li>• <b>Value unselected:</b> Check box is deselected.</li> <li>• <b>Assigned to (optional):</b> Creates or selects a variable, and assigns the value from the specified form element to this variable.</li> </ul>
Hot key	<p>Runs the actions when specific keys are pressed.</p>	<ul style="list-style-type: none"> <li>• Modifiers: Ctrl, Shift, Alt, AltGr, and Win</li> <li>• Keys: <ul style="list-style-type: none"> <li>• Letters A-Z</li> <li>• Numbers 0-9</li> </ul> </li> </ul>
Object	<p>Runs the actions when an event occurs on the selected interface element. For example, when a user clicks a button.</p> <p>Interface triggers for objects are available only for native Windows applications.</p>	

## V11 Task Bot package

The **V11 Task Bot** package enables you to run a 11.x bot from Automation 360 in the 11.x Control Room.

## Actions in the V11 Task Bot package

The package includes the following action:

Action	Description
Run	See <i>Using Run action</i> .

## Using Run action

Use the **Run** action to run a 11.x bot from Automation 360 in the 11.x Control Room.

Ensure that the 11.x user credential that you want to use to run the 11.x bot includes the following:

- Access to the 11.x Bot Runner device on which you want to run the 11.x bots
- **Run my bots** and **View my scheduled bots** permissions

To use the **Send callback status to A2019** option, ensure the following:

- The IP address of the Automation 360 Bot Runner device on which you want to run the Automation 360 bot is a static IP address
- The IP address is available in the callback URL of the 11.x Control Room

### *Callback URLs for bot deployment*

1. Double-click or drag the **Run** action from the **V11 Task Bot** node in the **Actions** palette.
2. Provide the 11.x Control Room URL in which you want to run the bot.
3. Click the **Credential** tab to use a value from the Credential Vault and the **Variable** to use a credential variable.

Alternatively, click the **Insecure string** tab to manually specify the value you want to use as the **Username** and **Password** to log in the Control Room you have specified.

4. Specify the location of the bot you want to run in the **Task relative path** field.
5. Optional: Specify the device on which you want to run the bot in the **Bot Runner device name** field. You can specify multiple devices separated by a semicolon. Ensure that the names of the devices you have provided are the same as those on the **My Devices** page of the 11.x Control Room.

If you do not provide any value in the field, the system runs the bot on any connected devices (device for which the user specified in the Step 3).

6. Select the **Run bot runner session on Control Room** check box to deploy the bot using the remote desktop process.
7. Select the **Wait for task to complete** check box if you want the system to wait for the task to complete before performing the next action in the bot.
  - a) Specify the period you want the system to wait before the bot is timed out in the **Total wait time** field.
  - b) Select the version of the Control Room on which you want to run the bot.

- **11.3.2 or later** (includes 11.3.3.x releases):

Click **Advanced settings** to expand and update the polling attributes.

Field	Description
Wait time before start polling the status	Period (in seconds) you want the system to wait before it starts polling the status after the bot is deployed on the device.
Polling interval for non-started execution	Time interval at which you want the system to poll for status for the 11.x bot you have set to run but has not started execution.

Field	Description
Polling interval for pending execution	Time interval at which you want the system to poll for status for the bot that you have set to run and is pending execution.
Polling interval for paused execution	Time interval at which you want the system to poll for status for the bot that has started execution and is paused.
Polling interval for in-progress execution	Time interval at which you want the system to poll for status for the bot that has started execution and is currently in progress.
Polling interval for unknown execution	Time interval at which you want the system to poll for status for the bot that has started execution and the current status is unknown.

- **11.3.4 or later:**

- Select the **Send callback status to A2019** option to specify a range for the TCP port that you want to use to send the callback status to Automation 360.

Field	Description
From available TCP port	Starting value in the range for the TCP port that you want to use to send the callback status.
To available TCP port	End value in the range for the TCP port that you want to use to send the callback status.

---

**Note:** The IP address of the Automation 360 Bot Runner must be reachable from 11.x Control Room on the range for the TCP port you have provided.

- Select the **Poll status from 11.x Control Room** option. Click **Advanced settings** to update the polling status from the 11.x Control Room:

Field	Description
Wait time before start polling the status	Period (in seconds) you want the system to wait before it starts polling the status after the bot is deployed on the device.
Polling interval for non-started execution	Time interval at which you want the system to poll for status for the 11.x bot you have set to run but has not started execution.
Polling interval for pending execution	Time interval at which you want the system to poll for status for the bot that you have set to run and is pending execution.

Field	Description
Polling interval for paused execution	Time interval at which you want the system to poll for status for the bot that has started execution and is paused.
Polling interval for in-progress execution	Time interval at which you want the system to poll for status for the bot that has started execution and is currently in progress.
Polling interval for unknown execution	Time interval at which you want the system to poll for status for the bot that has started execution and the current status is unknown.

8. Select the dictionary variable from the **Input parameters** list that you want to use to pass input parameters for the bot.

The input variables that you want to pass for the bot are contained as keys in the dictionary variable with their corresponding values.

9. Select the dictionary variable that you want to use to store the output from the **Assign the output to** list.

The dictionary variable stores the output parameters of the 11.x bot as keys.

Additionally, the following keys are added in the dictionary variable by default:

Key	Value
COMMAND	Name of the command that was last executed by the 11.x bot.
STATUS	Status of the 11.x bot execution.
START_TIME	Time when execution of the 11.x bot started.
END_TIME	Time when execution of the 11.x bot ended.
AUTOMATION_NAME	Name of the automation

10. Click **Save**.

## VBScript package

The **VBScript** package contains actions that enable VBScript functions in a task.

### Before you start

1. Verify that the device on which you want to run the VBScript has Windows operating system installed.
2. Open a VBScript file, or input the script you want to run using the **Open** action. You must associate the details of the file or script you want to run with a session name. Use this same session name for other **VBScript** actions.

3. Use the **Run function** action to execute a function within the script or execute the entire script. You must use the VBScript session name you established in the previous step.
4. After you have executed the script, close the VBScript session.

To review the bot launcher logs, navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\<current month>\Bot_Launcher-<today's date>.log.zip`. Each zipped folder contains a file with data on the code execution, which is useful for debugging.

## Actions in the VBScript package

The **VBScript** package includes the following actions:

**Note:** The **Open** action must be the first action to use the VBScript in a task.

Action	Description
Close	<p>Closes the session.</p> <p>Specify the same session name from the <b>Open</b> action.</p>
Run function	<p>Runs a function within the VBScript.</p> <ul style="list-style-type: none"> <li>• In the <b>VBScript session</b> field, specify a session name. Use the same session name from the <b>Open</b> action.</li> <li>• <b>Optional:</b> Specify the function name to run and the arguments to pass to the function.</li> </ul> <hr/> <p><b>Note:</b> You can pass only a list variable as an argument for the function. You can use the list variable to pass multiple arguments of different data types such as Boolean, datetime, number, and string.</p> <ul style="list-style-type: none"> <li>• <b>Optional:</b> If the specified function returns a value, specify the variable to store that value in the <b>Assign the output to variable</b> field. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a <code>-1</code>, <code>-2</code>, <code>-3</code>, and so on to avoid duplication.</li> </ul> <hr/> <p><b>Note:</b> In VBScript, stand alone scripts do not return a value.</p>
Open	<p>Opens a VBScript file.</p> <ul style="list-style-type: none"> <li>• In the <b>VBScript session</b> field, specify a session name. Use this same session name for other <b>VBScript</b> actions.</li> <li>• In the <b>VBScript</b>, choose one of the following options: <ul style="list-style-type: none"> <li>• In the <b>Import existing file</b> option, select an existing VBScript file.</li> </ul> <hr/> <p><b>Note:</b> If you are uploading a script from a file on your desktop, the file and any dependencies must be in a standalone folder. When you select a file for upload, all files and folders at the same folder level are uploaded.</p> <hr/> <li>• In the <b>Manual input</b> option, enter the VBScript.</li> </li></ul>

## Resources

To learn more, see [Training - Write inline scripts in a bot](#). This course introduces you to write inline scripts within a command.

---

**Note:** You must log in with a registered A-People Community [account](#) to access course.

---

## Wait package

Use the actions in the **Wait** package to add a condition to wait for an application screen to change, or a separate window to open or close before proceeding to the next action.

### Actions in the Wait package

The **Wait** package includes the following actions:

Action	Description
Wait for condition	<p>Makes the bot wait until a specific condition is true before executing the next action.</p> <p>In the <b>Wait till</b> field, specify the condition to meet. For example, the wait condition can be based on whether an application is running, a folder or file exists, a variable matches the specified value, an application window exists, or a machine or server is running.</p> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>If a bot encounters an internal error that does not appear on the UI, it does not wait for the amount of time that is specified in this action. The bot does not stop and continues to the next line.</li> </ul> <hr/> <p>This action offers the same conditions as the If package. See the <a href="#">If package</a>.</p>
Wait for screen change	See <a href="#">Using Wait for screen change action</a> .
Wait for window	See <a href="#">Using Wait for window action</a> .

### Using Wait for screen change action

Use the **Wait for screen change** action to wait for the content of a specific screen or the entire window to change before executing the next action.

For example, a Human Resources (HR) personnel automating leave-management tasks wants to log in to the HR portal. After entering the user credentials, this action enables the automation task to wait until the next screen loads.

- In the **Actions** palette, double-click or drag the **Wait for screen change** action from the Wait package.
- In the **Screen change relative to** field, choose **Window** or **Screen**.

## 3. Select an application window:

Option	Steps
<b>Application</b>	<p>From the drop-down list, select the window title from the open applications.</p> <ul style="list-style-type: none"> <li>The <b>Window title</b> field displays the title of the application window you have selected.</li> </ul> <p>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> <ul style="list-style-type: none"> <li>The <b>Executable</b> field displays the complete path of the executable file to identify the right window.</li> </ul>
<b>Variable</b>	Use a window variable to specify the application window you want to use.

4. Enter values (in pixels) in the **Left, Top, Width, and Height** fields to specify the dimensions of the screen.

The measurement starts from the top-left corner of the screen. Move vertically downward to indicate the height and horizontally from left to right to indicate the width.

5. In the **How long to wait before comparing screens?** field, specify the wait time (in seconds) to begin comparing the window or screen.

When a difference is detected, the comparison stops and the task proceeds to the next action.

6. In the **How long to wait before screen comparing is stopped?** field, specify the wait time (in seconds) for the screen to change.

If the screen does not change within the time you specified, the task proceeds with the next action.

7. Select the **Throw an exception if the screen is not changed** option to show an error message and terminate the bot if the screen does not change.  
If the option is deselected and the screen does not change, the task proceeds with the next action.
8. Click **Save**.

## Using Wait for window action

Use the **Wait for window** action to wait for the specified window to open or close before executing the next action.

For example, a Human Resources (HR) personnel automating leave-management tasks might require the attendance application to open before they enter the user credentials. This action enables the automation task to wait until the application window opens.

1. In the **Actions** palette, double-click or drag the **Wait for window** action from the Wait package.
2. In the **Wait for window** field, select the option you want the automation to wait for:
  - **Wait for window to open**
  - **Wait for window to close**

## 3. Select an application window:

Option	Steps
<b>Application</b>	<p>From the drop-down list, select the window title from the open applications.</p> <ul style="list-style-type: none"> <li>The <b>Window title</b> field displays the title of the application window you have selected.</li> </ul> <p>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> <ul style="list-style-type: none"> <li>The <b>Executable</b> field displays the complete path of the executable file to identify the right window.</li> </ul>
<b>Variable</b>	Use a window variable to specify the application window you want to use.

4. In the **How long you would like to wait for this condition to be true?** field, specify the wait time (in seconds) for the window to open or close.

If the window does not open or close within the time you specify, the task proceeds to execute the next set of actions.

5. Select the **Throw an exception if wait for window is unsuccessful** option to show an error message and terminate the bot if the window does not open or close within the specified amount of time.

If the option is deselected and the window does not open or close within the specified amount of time, the task proceeds with the next action.

6. Click **Save**.

## Window package

Use the **Window** package to automate tasks relating to the window.

**Window** is a data type available for storing application window titles. It is the only data type that can be used in all the actions of the **Window** package. Create a variable of data type **Window** and select or assign a window title. Use this variable in any number of actions within the automation task. If the application window title changes, then change the value assigned to the variable. The new application title is reflected in all the actions where the variable is used.

### Actions in the Window package

The **Window** package includes the following actions:

Action	Description
Activate	<p>Activates a window.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li>In the <b>Window title</b> field, specify the title. <p>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> </li> </ul>

Action	Description
Assign	<p>Assigns a source window variable's value to a designated window.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li>In the <b>Select the destination window variable/value</b> field, specify the variable.</li> </ul> <hr/> <p><b>Note:</b> The regular expression (regex) is currently not supported.</p>
Close	<p>Closes the application window.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> </ul> <p>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p> <hr/> <p><b>Note:</b> When multiple Excel windows are opened, the bot closes all the open Microsoft Excel windows even when a specific Excel window name is selected to close.</p>

Action	Description
Get active window title	<p>Retrieves the title of the active window. In the <b>Assign the window title to variable</b> field, specify the variable. The Control Room shows a descriptive default variable name. If you create several output variables, subsequent variable names are appended with a -1, -2, -3, and so on to avoid duplication.</p> <hr/> <p><b>Note:</b> The regular expression (regex) is currently not supported.</p>
Maximize	<p>Maximizes a window.</p> <ul style="list-style-type: none"> <li>• In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li>• <b>Application:</b> Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li>• <b>Browser:</b> Select from a list of Google Chrome tabs.</li> <li>• <b>Variable:</b> Select an existing window variable to specify the title of the application window title.</li> </ul> </li> </ul> <p>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p>

Action	Description
Minimize	<p>Minimizes a window.</p> <ul style="list-style-type: none"> <li>• In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li>• <b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li>• <b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li>• <b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> </ul> <p>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</p> <p>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.</p> <p>For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</p>

Action	Description
Resize	<p>Resizes a window.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li>Insert a wildcard character (*) in the <b>Window title</b> field to search for window titles that can change. You can specify one or more wildcards (*) at the start, middle, or end of the value. For example, to perform an operation on any window that has <code>Microsoft</code> in the title, use a wildcard to indicate any string by adding it before or after the value: <code>*Microsoft*</code>. The first searches for the exact window title (<code>Microsoft</code>), and if it does not find a match, it searches for windows with the term <code>Microsoft</code> anywhere in the title.</li> <li>You can use a regular expression (regex) to identify a window title. Select the regular expression either as a <b>String</b> or <b>Pattern</b> for each regular expression condition and enter the value. By default, the <b>Window title</b> field is case-sensitive. You can enable <b>Case insensitive</b> regex flag to identify a window title that is not case-sensitive.  For example, you can enter the <b>String</b> value as <code>((\w*)-Notepad</code> for all the window title names starting with <code>((\w*)-Notepad</code>, or use <b>Pattern</b> such as <code>((\w)\s)*document-Notepad</code> for only those window titles that match this pattern.</li> <li>In the <b>Left</b>, <b>Top</b>, <b>Width</b>, and <b>Height</b> fields, specify values for resizing the window.</li> </ul>
Set title	<p>Assigns a new window title to a window variable.</p> <ul style="list-style-type: none"> <li>In the <b>Window</b> field, select an option: Choose from the <b>Application</b>, <b>Browser</b>, or <b>Variable</b> tab. <ul style="list-style-type: none"> <li><b>Application</b>: Select from a list of windows, including browser windows, that are currently open on the Bot Creator device.</li> <li><b>Browser</b>: Select from a list of Google Chrome tabs.</li> <li><b>Variable</b>: Select an existing window variable to specify the title of the application window title.</li> </ul> </li> <li>In the <b>New window title</b> field, enter the new title.</li> </ul> <hr/> <p><b>Note:</b> The regular expression (regex) is currently not supported.</p> <hr/>

## Workload package

The Workload package enables you to insert work items in a queue for workload automation. It also enables data chaining between multiple queues. You can orchestrate multiple bots, and enable optimal device utilization through the queuing mechanism of workload management.

For example, a business process of Employee Salary Processing:

- A payroll queue can process the employee salaries, and a payroll bot can add work items to a finance queue.
- The finance queue in turn can release the funds to employees and a finance bot in turn adds work items in a HR queue to email employees on the salary processing completion.

You must have the Queue **Owner** or **Participant** privileges to view the list of queues in the Workload package.

### Actions in the Workload package

The Workload package includes the following action:

**Note:** If you built a bot using actions from the Workload package from Build 5322 or earlier, the action will be missing when you open the bot with the default package version. You must reinsert the action and repopulate the fields.

Action	Description
Insert work item	Allows you to insert a work item from an existing queue to another queue as part of a bot execution.

### Related concepts

#### [Workload management](#)

The workload management module enables users to upload Microsoft Excel and CSV files to the Control Room so that it feeds the records from the files into the bot deployments.

### Related tasks

#### [Attach work item template to TaskBot](#)

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

#### [Use Work Item variables](#)

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

### Using Insert work item action

The **Insert work item** action provides you the flexibility to insert a work item to another queue as part of a bot execution.

You must have the Queue **Owner** or **Participant** privileges to view the list of queues in the Workload package.

Use the **Insert work item** to manage complex workflows by configuring a bot to add work items from multiple queues. For example, use a bot to read a list of invoices from a .csv file and add the invoices due for payment to another bot that manages information of payments due on specific dates. The automation can be used in the scenarios where work items are part of a different system (Database, Excel) and the

bot reads them and adds them to a queue or where one queue adds work items to another queue as part of data chaining.

1. In the **My bots** page, **Create** a bot or **Edit** an existing bot.
2. In the **Actions** palette, double-click or drag the **Insert Work Item** action from the Workload package.
3. In the **Workload: Insert work item** window, add parameters such as the **Queue** and work item values:
  - a) Click **Browse** to select a queue name from the list of queues to insert as a work item.
  - b) Click **Confirm** to add the queue.
  - c) Start entering work item values in the work item fields.

---

**Note:** These parameters are populated based on the work item template associated with the selected queue.

---

You can also assign a variable value to these parameters by pressing the F2 key and selecting a variable name from the list.

---

**Tip:** Use UTC format (YYYY-mm-dd 00:00:00) for **Date** data type.

---

4. Click **Save**.  
The action is added to the bot.
5. Add more data using the **Insert Work Item** action.  
After the required data is added, **Save** the bot and **Check in** the bot to the **Public** folder for further processing and deployment.

### Related concepts

#### [Create workload queues](#)

A queue is one of the main building blocks of Workload Management (WLM). A queue holds data known as Work Items for further processing. The system distributes these Work Items to individual unattended Bot Runners in a device pool for processing.

### Related tasks

#### [Attach work item template to TaskBot](#)

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

#### [Use Work Item variables](#)

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

#### [Insert Work Items](#)

Add Work Items from an Excel or CSV file to the queue after you define the structure.

## XML package

Extensible Markup Language (XML) is a markup language designed to store and transport data. Use the actions in the XML package to automate the processing of XML data generated from web services and cloud computing applications.

An XML document is structured as an ordered and labeled tree. Each node of the tree is an XML element and is written with an opening and closing tag. In the following example, `custname` and `custid` are nodes:

```
<customer>
<custname>XYZ Corp</custname>
<custid>A001</custid>
```

```
</customer>
```

XPath is a query language that uses path expressions to select nodes or node-sets in an XML document. XPath includes built-in functions for manipulation of string, numeric, Boolean, date and time, and so on.

## Before you start

Perform the following actions within the XMLpackage.

1. Start the XML session using the **Start XML Session** action. Use this session name for all corresponding actions.
2. Use the different actions available in the XML package to automate XML-related tasks.
3. Save the session using the **Save XML Session** action to assign the data to a file or String-type variable.
4. End the session using the **End XML Session** action to complete a task.

## Actions in the XML package

The XML includes the following actions:

Action	Description
Delete node	<p>Deletes a specific node from XML file.</p> <ul style="list-style-type: none"> <li>• Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action .</li> <li>• Enter the <b>XPath expression</b> for the node to be deleted.</li> <li>• Enter the <b>attribute</b> (optional)</li> </ul>
End session	<p>Closes an XML session.</p> <ul style="list-style-type: none"> <li>• Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action.</li> <li>• <b>Save</b> and close the session.</li> </ul>
Execute XPath function	<p>Executes an XPath function and stores the results in a variable.</p> <ul style="list-style-type: none"> <li>• Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action .</li> <li>• Enter the <b>XPath expression</b> or select an existing variable.</li> <li>• Assign a <b>String-type variable</b> to the output.</li> </ul>

Action	Description
Get multiple nodes	<p>Retrieves the value of multiple nodes.</p> <ul style="list-style-type: none"> <li>Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action .</li> <li>Enter the <b>XPath expression</b> to retrieve multiple nodes or select an existing variable.</li> <li>In the Get each node field, select if you require the <b>Text value, XPath expression, or Specific attribute name of each node.</b></li> </ul> <p>For example,</p> <pre>&lt;Customer&gt;   &lt;Cust_Details&gt;     &lt;custid&gt;A001&lt;/ custid&gt;     &lt;custname&gt;XYZ Corp&lt;/custname&gt;     &lt;custzipcode&gt;15639&lt;/custzipcode&gt;     &lt;country&gt;Mexico&lt;/country&gt;     &lt;Locale lang="es"&gt; Spanish&lt;/Locale&gt;   &lt;/Cust_Details&gt; &lt;/Customer&gt;</pre> <ul style="list-style-type: none"> <li>Text value retrieves the exact value of the specific node element. For example, the <code>custname</code> element of a <code>Cust_Details</code> node retrieves the names of all the customers of the company.</li> <li>XPath expression refers to the path of the selected node in an XML document. An XPath expression such as <code>Customer//Cust_Details//custid</code> selects only customer IDs that are available in the customer details node.</li> <li>Specific attribute defines a property or the type of the element in a particular node. For example, <code>lang</code> is an attribute of the <code>Locale</code> element in a <code>Cust_Details</code> node. The output for <code>lang</code> attribute is displayed as <code>es</code>.</li> </ul>
Get single node	<p>Retrieves the value of a single node.</p> <ul style="list-style-type: none"> <li>Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action.</li> <li>Enter the <b>XPath expression</b>, and <b>attribute</b> (optional) to retrieve a node.</li> </ul> <p>Get single node retrieves the first value from the XML document based on the provided XPath expression and the attribute.</p> <ul style="list-style-type: none"> <li>Xpath expression with attribute: The attribute value of the XPath expression element is displayed. For example, If the XPath expression is entered as <code>Customer//Cust_Details//Locale</code> with the attribute as <code>lang</code>, the output is displayed as <code>es</code>.</li> <li>XPath expression without attribute: The value of the XPath expression element is displayed. For example, If the XPath expression is entered as <code>Customer//Cust_Details//Locale</code> without any attribute, <code>Spanish</code> is displayed as an output.</li> </ul> <ul style="list-style-type: none"> <li>Assign the output to a <b>String-type variable</b>.</li> </ul>
Insert node	See <a href="#">Using Insert node action</a> .

Action	Description
Save session data	<p>Saves the XML session data to a file or variable of type String.</p> <ul style="list-style-type: none"> <li>• Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action.</li> <li>• To save the session data to a file, select the <b>Write XML data</b> option and specify a <b>file path</b>.</li> <li>• Select <b>Overwrite</b> to replace the existing file if a file with the same name exists in the location you have specified.</li> <li>• Assign the output to a <b>String-type variable</b>.</li> </ul>
Start session	<p>Creates a new XML session based on an XML file or specified text.</p> <ul style="list-style-type: none"> <li>• Start the XML session.</li> <li>• Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action. Use this <b>session name</b> for all corresponding actions.</li> <li>• In the Data Source field, select either <b>File</b> or <b>Text</b>: <ul style="list-style-type: none"> <li>• File: Select from the <b>Control Room file</b>, <b>Desktop file</b>, or an existing <b>Variable</b> of File type.</li> <li>• Text: Specify the text name or select an existing variable.</li> </ul> </li> <li>• Save the XML session.</li> </ul>
Update node	<p>Updates the value of a node.</p> <ul style="list-style-type: none"> <li>• Type the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action.</li> <li>• Enter the <b>XPath expression</b> for the node to be updated.</li> <li>• Enter a <b>New value</b> for the node.</li> <li>• Select the <b>Updates attribute(s)</b> option to create a new <b>Dictionary</b> or to add an existing <b>Variable</b> of Dictionary-type.</li> </ul>
Validate XML document	<p>The tags and document structure are defined when the XML document is created. Use this action to validate an XML document.</p> <ul style="list-style-type: none"> <li>• Enter the <b>session name</b> or select an existing variable used in the <b>Start XML session</b> action.</li> <li>• Select the validation type from the following options: <ul style="list-style-type: none"> <li>• <b>XML schema files (.xsd)</b> <ul style="list-style-type: none"> <li>• Specify the schema using a <b>List</b> or <b>Variable</b>. Create a new variable of type <b>List</b> or use one that already exists.</li> </ul> </li> <li>• <b>Internal Document Type Definitions (DTDs)</b></li> <li>• <b>Well formed</b></li> </ul> </li> <li>• Assign the output to a variable using <b>Assign the output (Valid or Invalid) to variable</b></li> </ul>

## Using Insert node action

Use this action to insert a node in an existing XML file and assign it to a value. Optionally, assign a name space and attributes to the node.

To insert a node, do the following:

1. Enter the session name.  
Use the name of the session that you have used in the **Start XML session** action.
2. Specify an **XPath expression** to indicate where to insert the new node.
3. Enter a node name.
4. Enter a value for the node.
5. If the node name exists, select from the following options:
  - **Insert it anyways**
  - **Skip it**
  - **Overwrite it**
6. Specify the location to insert the node from the following options:
  - **Beginning of the child nodes**
  - **End of the child nodes**
  - **Before specific child note**
  - **After specific child node**

If **Before Specific child node** or **After Specific child node** is selected, specify the child node name before or after which the node must be inserted.

7. Optional: Enter the default name space to be mapped to the node.
8. Enter the attributes using a Dictionary-type variable.  
Create a new variable of type **Dictionary** or use one that already exists.
9. Optional: Enter the attribute name space using a Dictionary-type variable  
Create a new Dictionary-type variable or use one that already exists.
10. Click **Save**.

## Get started with recorders

You can use two recorders in Automation 360, the Universal Recorder and the AISense Recorder, to automate tasks by recording interactions with objects such as click, read (data extraction), and write (data entry).

### An integrated Recorder

In versions 2.0.9-20201105-164103 and later, the Recorder package contains both the Universal Recorder and AISense Recorder. This offers the following benefits:

- Feature updates are delivered as delta updates, which reduces the time spent downloading the newest Recorder package each release.
- The **Start recording** icon serves as a common entry point to both recorders.

---

**Note:** The AISense Recorder fails if you manually upgrade the Recorder package version, such as by importing a bot that contains the integrated Recorder package (Version A2019.17 and later) to a Control

---

Room that has a build from Version A2019.16 or earlier. Always upgrade the Recorder package through the Control Room. Do not attempt to manually upgrade by importing a .jar file or bot.

---

## Choosing which recorder to use for your task

Before you start building your bot, decide which recorder best fits your requirements.

- Use the Universal Recorder to automate interactions with user interface objects in a browser, HTML, Java, Microsoft, Oracle, SAP, or Windows application. When you run the bot, if it cannot reliably find objects, use the AISense Recorder.
- Always use the AISense Recorder in the following scenarios:
  - You are accessing the software using Citrix, or a similar remote desktop technology.
  - You are automating in a legacy technology, such as Delphi.

## Universal Recorder for object-based automation

Use the Universal Recorder to record interactions, such as click, read (data extraction), and write (data entry) with user interface (UI) objects on the desktop, taskbar, or in an application or browser window.

The earlier Automation Anywhere RPA products such as Version 11.3 have three separate recorders to capture objects from various environments. Automation 360 combines the capabilities of these three recorders into the Universal Recorder to streamline the recording process.

## Using the Universal Recorder

You can use the Universal Recorder in the following ways:

1. To record a process consisting of multiple steps, use the Universal Recorder video camera icon, which is located on the top-left of the workbench.

See [Record a task with the Universal Recorder](#).

2. To record a single interaction that you want to add into an existing TaskBot (for example, if you missed a step when recording a task), use Capture action from the Recorder package.

See [Using the Capture action](#).

For a common use case, see [Example of entering data into a web form from a worksheet](#).

The Universal Recorder is also used within actions to capture coordinates (**Mouse** > **Click** action) or a local file path (**Application** > **Open program/file** action).

## Background processing

Background processing enables an automation that involves interacting with an application in the foreground (such as mouse clicks) to run in the background. We recommend that you use this option to increase the visibility of the target object and improve bot accuracy. The following actions support background processing:

- Click
- Set Text
- Get Text

**Related tasks**[Record a task with the Universal Recorder](#)

Use the Universal Recorder to capture a series of interactions (clicks, keystrokes, and mouse movements) with object controls including text boxes, buttons, tables, menus, radio buttons, combo boxes, check boxes, list views, links, trees, and page tabs.

[Edit a task recorded with the Universal Recorder](#)

After recording a task, edit the **Capture** actions to change the window, capture a different object, select a new action, enable background processing, enter a different wait time, or save the output to a variable.

**Related reference**[Browser requirements](#)

Review the browser requirements to access the Control Room.

[Secure recording mode](#)

When secure recording mode is enabled, the bots do not capture values of certain properties or store application images. This ensures that sensitive data is not stored in the bots. This setting only applies to bots that are created or edited after the mode is enabled.

[Recording tasks in applications that run on JRE](#)

Use the Universal Recorder to capture objects from Java applet, web start, and desktop applications that run using Java Runtime Environment (JRE) 6, 7, 8, 9, 10, and 11.

[Recorder package](#)

Use the **Capture** action from the Recorder package to capture an interaction with a user interface (UI) object such as a text box, button, table, menu, radio button, combo box, check box, list view, link, tree, and page tab.

[Actions performed on objects captured with Universal Recorder](#)

After capturing the object, specify the action for the bot to do to the object at runtime. For example, if you capture a hyperlink, you can select an action to click the link or to retrieve the link text. Refer to the table below for the objects and their possible actions.

## Record a task with the Universal Recorder

Use the Universal Recorder to capture a series of interactions (clicks, keystrokes, and mouse movements) with object controls including text boxes, buttons, tables, menus, radio buttons, combo boxes, check boxes, list views, links, trees, and page tabs.

- To use the Recorder, you must already have done the following:

- [Install Bot agent and register device](#)
- [Set user device credentials](#)

- Configure device display and font scale to 100%.

If you are using Recorder package version 2.0.6-20200626-193519 or later, you can record tasks in Google Chrome, Internet Explorer, Java, Microsoft Active Accessibility, and Microsoft UI automation applications on a computer that has display scale configured to 100%, 125%, or 150%.

- If you are automating a task using a browser, configure the zoom level to 100%.

If you are using Recorder package version 2.0.6-20200626-193519 or later, you can record tasks in a Google Chrome browser that does not have a zoom level setting of 100%.

- If you are automating a task using a Google Chrome browser, ensure that the Automation Anywhere plug-in that corresponds with the Automation 360 build version is enabled.

[Browser requirements](#)

Considerations when recording a task:

- Use clicks when possible rather than shortcut keys.

When you click an object using the Recorder, it retrieves the object's properties that enable the bot to identify the object at runtime. Keyboard shortcuts are less reliable, so use them when it is not possible to automate the task by a clicking an object.

- If you are automating a task using a browser, do not use autofill to enter values into fields.
- Record the task at low speed.
- Avoid dragging windows during the recording process.
- Avoid clicking on applications that are not part of the process you are recording and automating.
- When Internet Explorer is used, the action waits until the browser is completely rendered and is in a ready state before executing the action.

To record a task using the Universal Recorder, follow these steps:

1. From Automation Anywhere web interface, select **BOTS > My bots**.
2. Create a new bot or open an existing bot for which you want to record a task.
3. Click **Start recording**.

---

**Note:** In versions 2.0.9-20201105-164103 and later, the Recorder package contains both the Universal Recorder and AISense Recorder.

#### *An integrated Recorder*

---

The **Automation Anywhere Recorder** window appears.

4. Select a window from the drop-down list.  
If you opened an application recently and it is not available in the list, click the **Refresh** icon.
5. Click **Universal Recorder**.
6. Perform the steps in the task. For example, click buttons, fill in forms, or search a website.  
To perform an action on an object, move the mouse pointer on that object. The object is highlighted with a box. If the box does not appear, verify that you have enabled the necessary plug-in. For more information, see *Universal Recorder supported applications and browsers*.  
The **Recorder** window contains the number of operations recorded and a description of the most recently captured object. For example, 5. Left click on button 'Submit'.  
To redo the previous object capture, click the **Delete** icon at the bottom right of the **Recorder** window to discard the most recent capture.  
If Secure recording mode is enabled, a shield icon appears to the right of the red recording icon.

#### *Secure recording mode*

7. Click **Finish** after you finish capturing all the necessary objects.  
A **Capture** action is generated for each operation.  
Where applicable, the **Recorder** generates variables. *Your variables (user-defined)*
8. Edit the actions or click **Save**.

#### *Edit a task recorded with the Universal Recorder*

## Edit a task recorded with the Universal Recorder

After recording a task, edit the **Capture** actions to change the window, capture a different object, select a new action, enable background processing, enter a different wait time, or save the output to a variable.

Select the **List** view to see the full details of each action.

Edit a recorded task to do the following:

- Change the application window in which you want to perform the operation, or add a wildcard to the window title.

- Change the properties of the captured objects.
- Specify the action you want to perform on the captured objects.
- Introduce a delay before the next action is performed.
- Specify the variable you want to use to store the output.

To add a **Capture** action to the task, see [Using the Capture action](#).

To edit a recorded task, follow these steps:

1. Open the bot that contains the recorded actions you want to edit.
2. Click the **Capture** action that you want to edit.

Make the following changes, as necessary:

3. Change the window selection to the **Currently active** window option.
4. Optional: Insert a wildcard character (\*) in the **Window title** field to search for window titles that can change. You can specify one or more wildcards (\*) at the start, middle, or end of the value.

For example, to perform an operation on any window that has `Microsoft` in the title, use a wildcard to indicate any string by adding it before or after the value: `*Microsoft*`. The first searches for the exact window title (`Microsoft`), and if it does not find a match, it searches for windows with the term `Microsoft` anywhere in the title.

You can use a regular expression (regex) to identify a window title. Select the regular expression either as a **String** or **Pattern** for each regular expression condition and enter the value. By default, the **Window title** field is case-sensitive. You can enable **Case insensitive** regex flag to identify a window title that is not case-sensitive.

For example, you can enter the **String** value as `((\w*)-Notepad)` for all the window title names starting with `((\w*)-Notepad)`, or use **Pattern** such as `((\w)\s)*document-Notepad` for only those window titles that match this pattern.

---

**Note:** During runtime, verify that the TaskBot identifies the correct window. If it does not, do the following:

- a. Open the application or browser window.
  - b. Drag a **Window > Get active window title** action above the **Recorder > Capture** action.
  - c. Insert a string variable into the **Assign the window title to variable** field.
  - d. Drag a **Window > Set title** action below the **Window > Get active window title** action.
  - e. In the **Window** field, insert the window variable generated by the **Recorder > Capture** action.
  - f. In the **New window title** field, insert the string variable from the **Get active window title** action.
  - g. Click **Save**.
- 
5. Optional: Select the **Resize window** option to specify the window dimensions.  
This option delivers a more reliable bot. It resizes the window to the dimensions at which the task was recorded, which enhances the bot's ability to identify the target object.
    - If the window is maximized when you record the task, this option is unselected.
    - If the window is not at the maximum size when you record the task, this option is selected by default and the width and height fields auto-fill with the window dimensions.

---

**Note:** This option is only available for windows that can be resized. It is not available for the **Desktop** or **Taskbar** options.

---

**6. Review the **Object properties** table.**

The bot uses the selected properties to identify the object control at runtime.

a) Verify that the **Control Type** matches your intended object.

For example, when capturing a table from a website, ensure the **Control Type** and **HTML Tag** values are **TABLE**.

If the **Control Type** does not match your intended object, recapture the object control.

## b) Select and assign values to the object properties that you want to include in the object search.

For a more reliable bot, we recommend that you select only the properties that have static values (such as **Name**, **Class**, **Type**, **HTML ID**, and **DOMXPath**), and deselect the properties that have dynamic values (such as **HTML Href**, **Path** or **Value**), which are subject to change and cause bot errors.

You can use the wild card character (\*) and variables in object property values to re-use the same action to capture different objects in different scenarios.

**7. Select the **Action** from the drop-down list.**

For a full list of possible actions by object, see [Actions performed on objects captured with Universal Recorder](#).

- If you record a click and keystrokes in a text box with a **Control Type** of `PASSWORD_TEXT`, the **Recorder** does not capture the keystrokes entered into the field. Instead, the action selects the **Set text** option and offers options to securely input the password. We recommend that you store the password in the Credential Vault and insert it into the action as a credential. [Credentials and credential variables in the Bot editor](#)

If you navigate to the text box using the TAB keystroke instead of a click in an MSAA or SAP application, the **Recorder** is able to identify fields with a **Control Type** of `PASSWORD_TEXT`.

- If the selected **Action** supports background processing, a **Run in the background** option appears. [Background processing](#)

**8. Optional: Enter a value in the **Wait for control** field to specify the number of seconds the bot must wait for the object control to appear on the application window.**

We recommend setting a delay time when using the Set text action to enter keystrokes into a text field.

**9. Optional: Assign the output to a variable.**

The Control Room suggests a descriptive default variable name based on the action you selected in step 8. For example, if you selected **Get property**, the suggested output variable is `PropertyValue`. If you create several output variables, subsequent variable names are appended with an "-1" to avoid duplication.

**10. Perform the Steps 3 through 9 for the other actions that you want to edit in the bot.****11. Click **Save**.****Link an object to a supporting anchor**


---

**Note:** You can use object anchoring in MSAA, UI Automation, or Java applications.

---

At runtime, if the bot cannot reliably identify an object, link it to a nearby object (such as a link or button) that is easier for the bot to find:

1. Open the **Capture** action.
2. Click the **Anchor** tab.

**3. Click **Capture anchor**.**

The browser or application window activates with the main object highlighted (the object that you previously captured). A dialog box appears, verifying whether the action has correctly identified the main object.

**4. If the correct object is highlighted, click **Yes, Select anchor**.**

Otherwise, click **No, I need to correct it** to select the correct object.

**5. Select a nearby object to the target object that is easier for the bot to find.**

The object is highlighted with an anchor icon on the right of the object.

**6. Click **Save**.**

## Universal Recorder supported applications and browsers

Use the Universal Recorder to record interactions with objects from the supported technologies.

### Applications

- HTML applications
- Java applet, web start, and desktop applications that run using Java Runtime Environment (JRE) 6, 7, 8, 9, 10, and 11 (32-bit and 64-bit versions)

See [Recording tasks in applications that run on JRE](#).

- Microsoft Active Accessibility and UI automation
- Microsoft Silverlight version 5 (standard Microsoft controls only)
- Oracle EBS and Forms
- SAP versions 730, 740, 750 patch 9, and 760 patch 5
- Citrix Virtual Apps
- Electron

### Browsers

- Google Chrome (versions 57 and later)

To build and run bots that contain actions from the Recorder package, you must enable the Google Chrome extension that corresponds with the Recorder package version. See [Google Chrome browser extension requirements](#).

If you encounter an error when recording or running a bot that automates tasks in a Google Chrome browser and you have installed the Google Chrome, you must perform additional steps to configure your system. See [Google Chrome extension troubleshooting](#).

- Internet Explorer (version 11)
- Microsoft Edge based on Chromium (versions 79 and later)

Microsoft Edge is supported on Recorder package version 2.0.9-20201105-164103 and later. You must install the A2019 plug-in for Microsoft Edge and verify that it is running in

the Task Manager: [Automation 360 extension for Microsoft Edge](#)

---

**Note:** Ensure that the Google Chrome extension is not installed in the Microsoft Edge browser because that configuration causes recording and runtime errors. [Google Chrome extension installed in Microsoft Edge](#)

---

- Mozilla Firefox (versions 80 and later)

Mozilla Firefox is supported on Recorder package version 2.0.11-20210128-034104 and later. You must install the A2019 extension for Mozilla Firefox: [Automation 360 extension for Mozilla Firefox](#)

### Desktop

The desktop refers to the device screen when all application and browser windows are minimized.

### Taskbar

The taskbar is the horizontal or vertical bar containing icons of open applications and browsers, as well as the notification area. You can capture application, browser, and system icons, such as Clock and Calendar, volume, and Wi-Fi.

### UI objects

See [Actions performed on objects captured with Universal Recorder](#).

Watch the following video for a demo on using the Universal Recorder in various applications:

### Related reference

[Actions performed on objects captured with Universal Recorder](#)

After capturing the object, specify the action for the bot to do to the object at runtime. For example, if you capture a hyperlink, you can select an action to click the link or to retrieve the link text. Refer to the table below for the objects and their possible actions.

#### *Google Chrome browser extension requirements*

Ensure the Automation Anywhere Google Chrome extension you are using corresponds with the Recorder package version in your bots.

Automation Anywhere has created two versions of the Google Chrome extension, based on the Recorder package version. **Automation Anywhere A2019 extension version 1.1.0.1 is the recommended Google Chrome extension for bots that contain actions from the Recorder package 2.0.6 and later.** Automation Anywhere Google Chrome extension version 11 or 12 is required only to run bots that contain actions from the Recorder package 2.0.5 and earlier.

Use the table below to verify that your system is running the correct browser agent and Google Chrome extension.

- Verify the browser agent in the **Windows Task Manager > Details** tab.

If the browser agent is in the Task Manager, but is not running:

1. Verify that the `ComSpec` variable is defined in the **Environment Variables** list.

You can locate this list in **My computer > Properties > Advance System Settings > Environment Variables**.

2. If the `ComSpec` variable is not in the list, define it by specifying the **Variable Name** as `ComSpec` and the **Variable Value** as `%SystemRoot%\system32\cmd.exe`.
- Verify the Google Chrome extension version in `chrome://extensions/`.
  - If necessary, install the Google Chrome extension using the links in the table below.

**Google Chrome re-verification:** Google Chrome requires re-verification of permissions when the Automation Anywhere Google Chrome extension is updated. If prompted, click **Enable this item** in the Google Chrome message. Alternatively, re-enable the extension through the links in the table above. Similarly, if you are deploying your Bot Runners from a master image, accept the permission from within that image.

Recorder package version	Browser agent	Google Chrome extension and ID
2.0.5 or earlier	<code>Automation.BrowserAgent.exe</code>	<a href="#">Version 11 or 12</a> ID: jjpdebaihkangkfpbgefmmnlafkahebn
2.0.6 or later	<code>Automation.Bot.BrowserAgent.exe</code>	<a href="#">Version 1.1.0.1 or later</a> ID: kammdlphdfejlopponbapgpbgakimokm

**Note:** If you upgrade the Bot agent version by uninstalling the Bot agent instead of directly upgrading, this also uninstalls the Google Chrome extension. In that case, you must manually reinstall the Google Chrome extension.

If you encounter an error when recording or running a bot that automates tasks in a Google Chrome browser and you have installed the Google Chrome, you must perform additional steps to configure your system. See [Google Chrome extension troubleshooting](#).

### Related reference

#### [Google Chrome extension troubleshooting](#)

If you encounter an error when recording or running a bot that automates tasks in a Google Chrome browser and you have installed the Google Chrome, you must perform additional steps to configure your system.

#### *Google Chrome extension troubleshooting*

If you encounter an error when recording or running a bot that automates tasks in a Google Chrome browser and you have installed the Google Chrome, you must perform additional steps to configure your system.

## Prerequisites

Ensure the Automation Anywhere Google Chrome extension you are using corresponds with the Recorder package version in your bots. See [Google Chrome browser extension requirements](#).

## Scenarios

To configure your system to run the Google Chrome extension, choose the scenario that applies to you and follow the steps.

- *If you are using Recorder package version 2.0.9 or later:*
- *If you are using Recorder package version 2.0.6, 2.0.7, or 2.0.8 (for Version A2019.16 or earlier)*
- If you are using Recorder version 2.0.5 or earlier on a device registered with Bot agent version .20 or later, we recommend that you upgrade the Recorder package to version 2.0.6 or later. If you do not want to upgrade the Recorder package version, follow the steps in the scenario that applies to you:
  - *If you are using Recorder package version 2.0.5 or earlier, and have never installed Automation Anywhere Enterprise Version 11.3 or later on your device*
  - *If you are using Recorder package version 2.0.5 or earlier, and have Automation Anywhere Enterprise Version 11.3 or later installed on your device*
- *If you uninstalled Automation Anywhere Enterprise Version 11.3 or later from your device*

Other Google Chrome extension troubleshooting scenarios:

- *Google Chrome extension installed in Microsoft Edge*
- *If you are not able to view the Google Chrome extension in offline mode*

If you are using Recorder package version 2.0.9 or later:

1. Verify that Google Chrome extension version 1.1.0.1 or higher is installed and enabled.  
To install the extension, see [Version 1.1.0.1 or later](#).
2. Open the Windows registry to the Google Chrome browser agent: Computer  
`\HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Google\Chrome\NativeMessagingHosts  
 \automation.bot.browseragent`
3. Verify that the registry entry points to the Automation 360 Bot agent installation directory:  
`C:\Program Files\Automation Anywhere\Bot Agent\AABrowserAgent  
 \AAChromeAgentManifest.json`  
 If this configuration is missing, reinstall the Bot agent.

If you are using Recorder package version 2.0.6, 2.0.7, or 2.0.8 (for Version A2019.16 or earlier)

1. Open the Windows registry to the Google Chrome browser agent: Computer  
`\HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Google\Chrome\NativeMessagingHosts  
 \automation.chrome.agent`

2. Verify that the registry entry points to the Automation 360 global cache: `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\<Recorder package version>\AAChromeAgentManifest.json`

For example, `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\2.0.6-20200626-193519-1bd6fceb-b036-4202-9932-4dc18349bd5c\AAChromeAgentManifest.json`

If this configuration is missing, do the following steps as an admin:

- a. Open the Automation 360 global cache: `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\<Recorder package version>`
- b. Run the `install.ps1` file.
- c. Repeat steps 2 and 3 to verify the registry entry is updated.

If you are using Recorder package version 2.0.5 or earlier, and have never installed Automation Anywhere Enterprise Version 11.3 or later on your device

---

**Note:** Use latest Recorder package version available in your Control Room.

---

1. Verify that Google Chrome extension version 11 or 12 is installed and enabled.

To install the extension, see [Version 11 or 12](#).

2. Open the Windows registry to the Google Chrome browser agent:

`Computer\HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`

3. Verify that the registry entry points to the Automation 360 global cache: `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\<Recorder package version>\AAChromeAgentManifest.json`

For example, `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\2.0.5-20200626-193519-1bd6fceb-b036-4202-9932-4dc18349bd5c\AAChromeAgentManifest.json`

If this configuration is missing, do the following steps as an admin:

- a. Open the Automation 360 global cache: `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\<Recorder package version>`
- b. Run the `install.ps1` file.
- c. Repeat steps 2 and 3 to verify the registry entry is updated.

4. Verify that the browser agent `Automation.BrowserAgent.exe` is running with the Google Chrome extension installed and enabled.

If this configuration is missing, restart Google Chrome. Either disable and enable the Google Chrome extension, or close all Google Chrome browser tabs and reopen a new window.

If you are using Recorder package version 2.0.5 or earlier, and have Automation Anywhere Enterprise Version 11.3 or later installed on your device

1. Verify that Google Chrome extension version 11 or 12 is installed and enabled.  
To install the extension, see [Version 11 or 12](#).
2. Open the Windows registry to the Google Chrome browser agent: `Computer\HKEY_CURRENT_USER\Software\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`
  - If the above key is available, disable the Google Chrome plug-in version 11.x and enable the Google Chrome plug-in version 12.x.
  - If the above key is not available, disable the Google Chrome plug-in version 12.x and enable the Google Chrome plug-in version 11.x.
3. Restart Google Chrome. Either disable and enable the Google Chrome extension, or close all Google Chrome browser tabs and reopen a new window.
4. Verify that the browser agent `Automation.BrowserAgent.exe` is running with the Google Chrome extension installed and enabled.

If you uninstalled Automation Anywhere Enterprise Version 11.3 or later from your device

Uninstalling the Enterprise client does not remove the Google Chrome extension and registry entries. To remove them manually, do these steps:

1. Disable Google Chrome extension 12.x.
2. Install and enable Google Chrome extension 11.x.
3. In the Windows registry editor, remove the following key: `Computer\HKEY_CURRENT_USER\Software\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`
4. Open the Windows registry to the Google Chrome browser agent:  
`Computer\HKEY_LOCAL_MACHINE\SOFTWARE\WOW6432Node\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`
5. Verify that the registry entry points to the Automation 360 global cache: `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\<Recorder package version>\AAChromeAgentManifest.json`  
  
For example, `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\2.0.6-20200626-193519-1bd6fceb-b036-4202-9932-4dc18349bd5c\AAChromeAgentManifest.json`
6. Restart Google Chrome. Either disable and enable the Google Chrome extension, or close all Google Chrome browser tabs and reopen a new window.

## Google Chrome extension installed in Microsoft Edge

Although Microsoft Edge browser settings allow extensions from the Chrome Web Store, we recommend that you **do not install** the Google Chrome extension in the Microsoft Edge browser. Installing it causes recording and runtime errors in bots that interact with the Google Chrome browser. Even if you did not manually install the Google Chrome extension, the auto-sync settings in the Microsoft Edge browser might have automatically installed the extension.

## If you are not able to view the Google Chrome extension in offline mode

1. Drag the file `ChromeExtension.crx` to the Google Chrome extension tab.  
This file is available in the same path where the `Automation.BrowserAgent.exe` file is available.  
Enable the Automation 360 Google Chrome extension.
2. If the Google Chrome extension is still not visible:
  - a. Verify if the registry entry `automation.chrome.agent` is available in the path `Computer\HKEY_CURRENT_USER\Software\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`.  
If it is not available, create the registry in the following path: `Computer\HKEY_CURRENT_USER\Software\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`  
This entry should have the same path as the entry: `Computer\HKEY_LOCAL_MACHINE\Software\Google\Chrome\NativeMessagingHosts\automation.chrome.agent`
  - b. Go to the path `Computer\HKEY_LOCAL_MACHINE\Software\Google\Chrome\Extensions`.  
For the 11.1.0.0 Automation 360 Google Chrome extension ID `jjpdebaihkangkfpbgefmmnlafkahebn`, create a new string with the name `path`.  
The value of the string will be the path of the `ChromeExtension.crx`, which is available in the same folder where the `AAChromeAgentManifest.json` file is available.  
For example, add the entry `C:\ProgramData\AutomationAnywhere\GlobalCache\embedded-resources\2.0.5-20200511-172840-1825fd43-19bc-4dd2-ac56-53a2aed4b0e4\ChromeExtension.crx` in the following locations:
    - `Computer\HKEY_LOCAL_MACHINE\Software\Google\Chrome\Extensions(ExtensionID)`
    - `Computer\HKEY_CURRENT_USER\Software\Google\Chrome\Extensions(ExtensionID)`
  - c. Restart Google Chrome. Either disable and enable the Google Chrome extension, or close all Google Chrome browser tabs and reopen a new window.

## Secure recording mode

When secure recording mode is enabled, the bots do not capture values of certain properties or store application images. This ensures that sensitive data is not stored in the bots. This setting only applies to bots that are created or edited after the mode is enabled.

A user with admin privileges must enable secure recording mode. See [Settings](#).

To capture objects in secure recording mode, ensure that the Recorder package is set to 2.0.0-20200318-020414 or higher. See [Manage Control Room packages](#).

When you record a task in secure recording mode, the **Preview** window temporarily shows the captured area. This image is deleted after you close the bot.

You can update the following object properties after capturing an object:

Technology	Object property
Microsoft Active Accessibility/UI automation/Java	<ul style="list-style-type: none"> <li>• Item name</li> <li>• Item value</li> <li>• Name</li> <li>• Parent</li> <li>• Value</li> </ul>
HTML	<ul style="list-style-type: none"> <li>• HTML InnerText</li> <li>• HTML name</li> <li>• HTML value</li> </ul>

## Recording tasks in applications that run on JRE

Use the Universal Recorder to capture objects from Java applet, web start, and desktop applications that run using Java Runtime Environment (JRE) 6, 7, 8, 9, 10, and 11.

Automation 360 supports JRE 6 and later on both 32-bit and 64-bit systems.

Verify whether additional configuration is necessary, depending on the JRE version:

- If JRE 7 update 6 or later is installed on the registered device, Java Access Bridge is automatically installed on that device.
- If JRE 7 update 5 or earlier is installed on the registered device, you must manually copy the required files to the corresponding directories. See [Java Access Bridge](#).
- If you have more than one version of JRE, Automation 360 configures Java Access Bridge with the default version. To configure it to a different version, you must manually copy the required files to the corresponding directories. See [Java Access Bridge](#).

The first time you record a task in an application running on JRE 6 or 7 update 5 or earlier, an error message might appear if the application is launched before Java Access Bridge is installed. Restart the application and proceed with recording the task.

## AISense for recording tasks from remote applications

AISense is the artificial intelligence (AI) powered capability of Automation 360 that helps you identify objects from an image or an application with a complex user interface (UI) and make automation in all environments faster and more accurate.

AISense is suitable when object-based automation fails or is not efficient for automating tasks on applications that are accessed remotely, in a Citrix environment, and legacy applications.

Some of the issues that affect the accuracy of an automation task in a remote environment are as follows:

- In a Citrix environment, the automation platform receives an image of the application and does not have access to the actual UI elements.
- Screen resolution and scaling might not be the same on the host and client machines.
- The position of a UI element might change for web applications due to a different resolution on the Bot Runner machine.

AISense uses computer vision to intelligently create dynamic linking between objects by determining their composition to deliver change-resilient automation. AISense enables you to accurately automate applications even when labels and text change their position.

---

### Important:

- Bots will fail if they contain actions from Recorder package versions 2.0.9-20201105-164103 or later and the AISense package. You must delete the **AISense** actions and recapture the objects using the integrated recorder icon. [An integrated Recorder](#)
- AISense Recorder supports the English and Simplified Chinese languages. When recording an application, ensure that the device locale is set to the same language as that application.

---

### Related tasks

#### [Record a task with AISense Recorder](#)

Use the AISense Recorder to record an end-to-end task on a remote application or an application with a complex user interface (UI).

#### [Edit a task recorded using AISense](#)

After you have recorded a task using the AISense Recorder, you can edit the recorded actions to perform various actions on the captured objects.

## Record a task with AISense Recorder

Use the AISense Recorder to record an end-to-end task on a remote application or an application with a complex user interface (UI).

- If you are automating a task using a browser, ensure that auto-fill is disabled for that browser.
- The screen resolution must be set to 1980x1080 or lower.
- Configure the device display settings to 100% DPI.
- If you are using Automation 360 On-Premises, ensure that the AISense Recorder package is added to your Control Room.

AISense Recorder can capture the following objects from an application: text boxes, buttons, radio buttons, combo boxes, table, check boxes, active and passive text, image button, scroll, and combo box.

Keep the following considerations in mind when recording a task:

- Record the task at low speed.
- Avoid dragging windows during the recording process.
- Avoid clicking applications that are not part of the process you are recording to automate.

To record a task using the AISense Recorder, follow these steps:

1. From Automation Anywhere web interface, select **BOTS > My bots**.
2. Create a new bot or open an existing bot for which you want to record a task.
3. Click **Start recording**.

---

**Note:** In versions 2.0.9-20201105-164103 and later, the Recorder package contains both the Universal Recorder and AISense Recorder.

#### [An integrated Recorder](#)

---

The **Automation Anywhere Recorder** window appears.

4. Select a window from the drop-down list.  
If you opened an application recently and it is not available in the list, click the **Refresh** icon.

**5. Click AISense Recorder.**

The first time you use the AISense Recorder on a device, the Recorder downloads the required dependencies.

The **Recorder** toolbar appears with **Finish**, **Scan**, **Define**, and **Pause** options.

The Recorder analyzes the application window you selected to identify the UI objects in that window. The options on the toolbar are disabled when the system is analyzing the application window. After the analysis, the options are enabled and you can start recording the task.

**6. Perform the actions to record. For example, click buttons, fill in forms, or select an option.**

To perform an action on an object, move the mouse pointer on that object. The system highlights an object along with the text associated with that object. For example, when you move the mouse pointer over a button or check box, the associated text with that button or check box is also highlighted and captured.

- If the object is not highlighted, click the **Scan** option on the recording toolbar. After the system finishes analyzing the application window, you can capture the required object.
- If you want to capture an option from a list, click the list and wait until the highlight appears around the box containing the options. After the box is highlighted, move the mouse pointer over the option you want to capture and wait until the option is highlighted.
- If you use scroll on an application window, you must click **Scan** to analyze the new objects on the window.
- If you want to record an interaction with an object that is only visible when you hover the mouse over the object, see [Detect hidden objects manually](#)

The **Recorder** window contains the number of operations recorded and a description of the most recently captured object. For example, 5. Left click on button 'Submit'.

To redo the previous object capture, click the **Delete** icon at the bottom right of the **Recorder** window to discard the most recent capture.

If Secure recording mode is enabled, a shield icon appears to the right of the red recording icon.

[Secure recording mode](#)

**7. Click Finish** after you finish capturing all the necessary objects.

A **Capture** action is generated for each operation.

Where applicable, the **Recorder** generates variables. [Your variables \(user-defined\)](#)

**8. Edit the actions or click Save.**

[Edit a task recorded using AISense](#)

**Detect hidden objects manually**

If an object is only visible when you hover the mouse over the object, you must manually specify the object type and location by anchoring it to the nearest text:

1. Click the object once.
2. Click **Define**.

The **AISense Define main object** window appears with a screenshot of the application, where the object is visible.

3. Click and drag a rectangle to outline the object to capture.
4. In the **Supporting anchor** list, select the text that is closest to the object you are capturing.
5. Click **Apply**.

**Related tasks**

[Edit a task recorded using AISense](#)

After you have recorded a task using the AISense Recorder, you can edit the recorded actions to perform various actions on the captured objects.

### Related reference

#### [AISense for recording tasks from remote applications](#)

AISense is the artificial intelligence (AI) powered capability of Automation 360 that helps you identify objects from an image or an application with a complex user interface (UI) and make automation in all environments faster and more accurate.

#### [Actions performed on objects captured with AISense Recorder](#)

After you capture objects using the AISense Recorder, you can perform various actions that a bot can perform on the object at runtime.

## Edit a task recorded using AISense

After you have recorded a task using the AISense Recorder, you can edit the recorded actions to perform various actions on the captured objects.

Edit a recorded task to do the following:

- Change the application window in which you want to perform the operation, or add a wildcard to the window title.
- Change the properties of the captured objects.
- Specify the action you want to perform on the captured objects.
- Introduce a delay before the next action is performed.
- Specify the variable you want to use to store the output.

---

**Important:** Only the following types of objects are supported with AISense Recorder:

- Text boxes
- Check boxes
- Combo boxes
- Radio buttons
- Buttons
- Table
- Active text

Active text is the text that you can click. For example, link, menu, text on a navigation pane, and so on. When there are duplicate active texts on the window, the AISense Recorder identifies and applies the action of the first occurrence of that active text on the window.

- Passive text

Passive text is the text that you can only read. It can be any text visible on the window that can be associated with a nearby static anchor text that is available during bot execution. When you select an area that has multiple lines, the AISense Recorder retrieves only the first line of the text from the area.

- Image button

An image button is a button that contains only image and does not have any text associated with it. For example, icons for delete, copy, cut, paste, and so on. You can capture image buttons that are hidden on the application screen and appear when you move the mouse pointer on the image buttons.

- Scroll on an application window and combo box

---

To edit a recorded task, follow these steps:

1. Open the bot that contains the recorded actions you want to edit.
2. Click the **Capture** action that you want to edit.

Make the following changes, as necessary:

- Click the **Window** tab or the **Variable** tab to specify a different application window on which you want to perform the operation.

If you have used the **Window** tab to specify the application window, you can use a wildcard character in the **Window title** field. The wildcard character is useful if the title of an application changes. For example, `Sample* - Google Chrome`.

---

**Note:**

- During runtime, verify that the TaskBot identifies the correct window.
- If you use scroll on an application window, you must click the **Analyze window** option to analyze the new objects on the window.

- 
- Update the object properties.

You can only update the value available in the **Anchor** field.

- Select an option from the **Action** list to specify the action you want to perform on the object.

For a full list of possible actions by object, see [Actions performed on objects captured with AISense Recorder](#).

- Optional: Enter a value in the **Wait for control** field to specify the number of seconds the bot must wait for the object control to appear on the application window.

We recommend setting a delay time when using the Set text action to enter keystrokes into a text field.

- Optional: Assign the output to a variable.

The Control Room suggests a descriptive default variable name based on the action you selected in step 8. For example, if you selected **Get property**, the suggested output variable is `PropertyValue`. If you create several output variables, subsequent variable names are appended with an "-1" to avoid duplication.

- Perform the Steps 2 through 7 for the other actions that you want to edit in the bot.

- Click **Save**.

*Actions performed on objects captured with AISense Recorder*

After you capture objects using the AISense Recorder, you can perform various actions that a bot can perform on the object at runtime.

For example, when you capture a button, you can select to click the button or to retrieve the button text. The following table lists the objects and their possible actions.

Object	Actions
Button	<ul style="list-style-type: none"> <li><b>Get property:</b> Extracts the value of the specified property of the captured object (such as the link text) and saves the value in a variable. To extract the link text, you must provide the text of the anchor that is associated with the control.</li> <li><b>Click:</b> Use this action to select the captured object.</li> <li><b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li><b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li><b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>

Object	Actions
Image button	<ul style="list-style-type: none"> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>
Active text	<ul style="list-style-type: none"> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>
Passive text	<p><b>Get text:</b> Retrieves text available in the area you have specified.</p>
Check box	<ul style="list-style-type: none"> <li>• <b>Get property:</b> Extracts the value of the specified property of the captured object (such as the link text) and saves the value in a variable. To extract the link text, you must provide the text of the anchor that is associated with the control.</li> <li>• <b>Get status:</b> Retrieves whether the check box is selected. Returns checked or unchecked.</li> <li>• <b>Check:</b> Selects the captured check box.</li> <li>• <b>Uncheck:</b> Clears the captured check box.</li> <li>• <b>Toggle:</b> Switches the check box to the opposite status. For example, if the check box is selected, use the <b>Toggle</b> action to clear it.</li> <li>• <b>Left click:</b> Use this action if the <b>Toggle</b> action does not work during Runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>

Object	Actions
Combo box (appears as a drop-down list)	<ul style="list-style-type: none"> <li>• <b>Get property:</b> Extracts the value of the specified property of the captured object (such as the link text) and saves the value in a variable. To extract the link text, you must provide the text of the anchor that is associated with the control.</li> <li>• <b>Get selected text:</b> Retrieves text from the selected item.</li> <li>• <b>Select item by text:</b> Selects the item that matches the text you have specified in the <b>Assign value</b> field.</li> </ul> <hr/> <p><b>Note:</b> The <b>Assign value</b> field is case-sensitive.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Expand:</b> Expands the combo box.</li> <li>• <b>Click:</b> Use this action to select the captured object.</li> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>
Scroll bar (within a combo box)	<ul style="list-style-type: none"> <li>• <b>Scroll Up:</b> Performs the scroll up operation. This action is similar to clicking the scroll up button one time.</li> <li>• <b>Scroll Down:</b> Performs the scroll down operation. This action is similar to clicking the scroll down button one time.</li> <li>• <b>Page Up:</b> Performs the page up operation. This action is similar to holding the scroll bar and moving it up. The distance by which the scroll bar is moved up is specified in the <b>Scroll Distance</b> field.</li> <li>• <b>Page Down:</b> Performs the page down operation. This action is similar to holding the scroll bar and moving it down. The distance by which the scroll bar is moved down is specified in the <b>Scroll Distance</b> field.</li> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>
RadioButton	<ul style="list-style-type: none"> <li>• <b>Get property:</b> Extracts the value of the specified property of the captured object (such as the link text) and saves the value in a variable. To extract the link text, you must provide the text of the anchor that is associated with the control.</li> <li>• <b>Get status:</b> Retrieves whether the radio button is selected. Returns selected or deselected.</li> <li>• <b>Select:</b> Use this action to select the captured radio button.</li> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>

Object	Actions
Table	<ul style="list-style-type: none"> <li>• <b>Get property:</b> Extracts the value of the specified property of the captured object (such as the link text) and saves the value in a variable. To extract the link text, you must provide the text of the anchor that is associated with the control.</li> <li>• <b>Get table:</b> Retrieves the table data and saves it to a table variable. <i>Example of extracting data from a web table</i></li> <li>• <b>Get cell text by index:</b> Retrieves the data in the specified cell located at the row and column index.</li> </ul> <hr/> <p><b>Note:</b> Row and column index counts start at 1. For example, to retrieve the data in cell A2, enter 1 in the <b>Row</b> field and 2 in the <b>Column</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Get total rows:</b> Retrieves the number of rows that contain values.</li> <li>• <b>Get total columns:</b> Retrieves the number of columns that contain values.</li> <li>• <b>Set cell by index:</b> Enters text into the cell located at the row and column index.</li> </ul> <hr/> <p><b>Note:</b> Row and column index counts start at 0. For example, to enter text into cell A2, enter 0 in the <b>Row</b> field and 1 in the <b>Column</b> field.</p> <hr/> <ul style="list-style-type: none"> <li>• <b>Click:</b> Use this action to select the captured object.</li> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>
TextBox	<ul style="list-style-type: none"> <li>• <b>Get property:</b> Extracts the value of the specified property of the captured object (such as the link text) and saves the value in a variable. To extract the link text, you must provide the text of the anchor that is associated with the control.</li> <li>• <b>Set text:</b> Enters the text you have specified in the captured field. It supports credentials. <i>Credentials and credential variables in the Bot editor</i></li> <li>• <b>Append text:</b> Adds text at the end of existing text in the captured field, instead of overwriting it.</li> <li>• <b>Click:</b> Use this action to select the captured object.</li> <li>• <b>Left click:</b> Use this action if the <b>Click</b> action does not work during runtime.</li> <li>• <b>Right click:</b> Use this action to perform the right-click operation on the captured object.</li> <li>• <b>Double click:</b> Use this action to perform the double-click operation on the captured object.</li> </ul>

## Use variable anchor

The variable anchor in the AISense Recorder enables you to perform an action on multiple objects of the same type.

You can either duplicate the action added for the variable anchor object to perform the action on the same object type or use the action within a Loop action.

1. From Automation Anywhere web interface, select **BOTS > My bots**.
2. Create a new bot or open an existing bot for which you want to record a task.
3. Click **Start recording**.

---

**Note:** In versions 2.0.9-20201105-164103 and later, the Recorder package contains both the Universal Recorder and AISense Recorder.

### *An integrated Recorder*

---

The **Automation Anywhere Recorder** window appears.

4. Select a window from the drop-down list.  
If you opened an application recently and it is not available in the list, click the **Refresh** icon.
5. Click **AISense Recorder**.  
The first time you use the AISense Recorder on a device, the Recorder downloads the required dependencies.  
The **Recorder** toolbar appears with **Finish**, **Scan**, **Define**, and **Pause** options.  
The Recorder analyzes the application window you selected to identify the UI objects in that window. The options on the toolbar are disabled when the system is analyzing the application window. After the analysis, the options are enabled and you can start recording the task.
6. Click an object or area on the application window that is not highlighted.
7. Click **Define**.  
The **AISense Define main object** window appears with a screen shot of the application.
8. Select the **Control Type**.
9. Click and drag a rectangle to outline the object to capture.
10. In the **Supporting anchor** list, select text that is closest to the object you are capturing.
11. Click **Apply**.
12. Click **Finish** after you have captured the required objects.  
The recorded steps appear as a separate action in the bot.

You can duplicate the action added for the variable anchor and update the value in the **Anchor** field with the anchor text of the object you want to capture, for each variable anchor action. Alternatively, use the action within the Loop action and use a variable that supports the string data type in the **Anchor** field.

13. Click **Save** to save the bot.

## Enable debug logs for AISense Recorder

You can use debug logs to troubleshoot the application window that you capture and to verify if the object is being detected correctly. The results are available as debug images in the %temp%\AISenseLogs folder.

1. On your local device, browse to `C:\Program Files\Automation Anywhere\Bot Agent\config`.
2. Open the `botlauncher-logging.xml` file.

**3.** Include the following logger entry within the <Loggers> XML element and save the XML file:

```
<Logger name="com.automationanywhere.recorder" level="DEBUG"/>
```

For example, add the debug logger entry below the existing logger entry.

```
<Logger name="com.automationanywhere.recorder" level="INFO"/>
<Logger name="com.automationanywhere.recorder" level="DEBUG"/>
```

Changes you make to the logging configuration file are updated in seconds configured per the monitor interval value.

---

**Note:** If the changes are not automatically applied per the monitor interval value, restart the Bot agent service.

---

## Working with bots

Depending on the license and permission assigned to you, you can perform various bot operations and access the private and public workspaces in the Control Room.

### Licenses

Two types of licenses are available: Bot Creator and Bot Runner (attended or unattended) licenses.

[Automation 360 licenses](#)

### Bot Creator tasks

A Bot Creator user can access both the private workspace and public workspace in the Control Room (**Bots** > **My bots** page). The license provides the user exclusive access to the registered device. Other users cannot use the default device of a Bot Creator.

With the Bot Creator license and specific permissions, you can perform the following tasks:

- [Create a bot](#)
- [Run a bot](#)
- Record a bot

[Record a task with the Universal Recorder](#) | [Record a task with AISense Recorder](#)

- [Schedule a bot](#)
- [Copy a bot](#)
- [Export a bot](#)
- [Import a bot](#)
- [Check in a bot](#)
- [Check out a bot](#)

You can also edit, analyze, save, clone, view content, delete, pause, or stop a TaskBot.

### Bot Runner tasks

A Bot Runner can access only to the public workspace in the Control Room. They cannot create or edit bots.

With the Bot Runner license and specific permissions, you can perform the following tasks:

- [Run a bot](#)
- [Schedule a bot](#)

You can also view the content of a TaskBot.

## Public and private workspaces

The Automation page lists all the folders and bots available within the selected folder in the **Public** and **Private** repositories. If you have migrated the 11.x or 10.x data to Automation 360, the Automation page additionally displays the 11.x or 10.x TaskBots (.atmx) and MetaBots (.mbot) files in the public repository.

When a 11.x or 10.x bot is migrated and converted to the Automation 360 bot, the **My Tasks** and the **My Metabots** folders display the migrated (11.x or 10.x) and the converted bots with the same name but different extension. This might create confusion to differentiate between the two bots. Also, you cannot take any actions on the migrated bots except deleting them. To avoid this confusion, you can use the **Show** menu option to show or hide the 11.x or 10.x bots.

The Show menu displays three options - **Folder**, **.ATMX Task Bot**, and **.MBOT Meta Bot**. By default, each of these options are selected and displays all the folders and sub folders along with the 11.x or 10.x bot files.

If you clear the selected **Folder** option, then the sub-folders will be hidden from the files and folders list and will only display `.atmx` or `.mbot` files and when you clear the selected **.ATMX Task Bot** or the **.MBOT Meta Bot** options, the `.atmx` or `.mbot` files, will then be hidden across all the folders.

Depending on the license, users logging in to the Control Room can access the private and public workspaces.

### Private workspace

Users with the Bot Creator license can access the private workspace. This workspace is primarily used to create and test bots. It enables users to view and manage all their activities in one primary location. Bots in the private workspace is available only to the users who created them.

---

**Note:** Users with administrative privileges and Bot Runner license cannot access the private workspace because they cannot create bots.

---

### Public workspace

Both Bot Creator and Bot Runner users can access the public workspace. This is a shared workspace where you can execute the bots.

Users with the Bot Runner license can run bots created by the Bot Creator user. Bots created in the private workspace by Bot Creators can be made available to specific Bot Runner users in the public workspace by defining the permissions at the folder or file level. To do this, users have to first check in the bot from the private workspace to the public workspace.

---

**Note:** When you create a TaskBot with dependencies, ensure that both the parent and child bot are in the same workspace (public or private). You cannot call a public bot from a private bot. To call a bot from the public workspace, you should first check-out or clone the public bot into the private workspace, include it as a child bot inside the private bot, and check-in both the bots.

---

## Run a bot

You can test an automated process by running a bot.

1. Log in to the Control Room.
2. From the **Bots > My bots** page, run the bot in the following ways:
  - Select the bot to run. Mouse over the actions menu (vertical ellipsis) located to the right of the bot name and click **Run Task Bot > Run bot now**.
  - Click the bot name. When the bot opens in the Bot editor, click **Run**.
  - Click **Run bot > Run bot now**. Enter the required details in the **Run bot now** page and click **Run bot now**.

Search the TaskBot folders, **BOTS**, or **DEVICES** to find a specific bot. Search for a specific item by *name* or *type* using the drop-down list and search field.

You can also run bots from the **In progress** and **My devices** pages.

If you encounter issues in running a bot, refer to the following articles:

- [Automation 360 - Unable to download the bot or the dependencies to the device; Error code: download.error \(A-People login required\)](#).
- [There is already an existing deployment in-progress for this user session \(A-People login required\)](#).

## Repeating a bot

Repeat a bot after run failure or when running routine bots.

### Options for repeating a bot

<b>Do Not Repeat</b>	Default. The bot runs once.
<b>Repeat</b>	Repeats the bot a number of times.
<b>Repeat until I stop it</b>	Repeats the bot until being stopped manually by clicking the <b>stop</b> button or by pressing the <b>ESC</b> key.
<b>Repeat for</b>	Repeats the bot for a time period (hh:mm:ss).
	<b>Note:</b> Specify up to 99 hours, 59 minutes, or 59 seconds.
<b>Time between repeats</b>	Sets a duration of time to wait before repeating a bot.
<b>Upon error, continue with next repeat</b>	The bot is repeated regardless of run failure.
	<b>Note:</b> Error handling cannot capture the error when this option is enabled.

## Considerations for running a bot

There are certain considerations you have to keep in mind when running a bot.

- As a Bot Creator, you can deploy a bot on your device or you can run the bot on a remote machine through RDP connection.
- If you are running bots on your local machine as a Bot Creator, enter only your username in the device login credentials; no password is required. The username is required to confirm that the same user who logged in to the local device is deploying the bot. If you are using the Google Chrome plug-in and running bots on your local machine, your username is required.
- As a Bot Runner, you can either deploy the bot yourself or select a run-as user assigned by the administrator. You can run the bot either through your device or choose from the list of devices in a device pool. If you choose to override the default device, the bot will be executed on any available device in the device pool for each run-as user.
- You can preload packages on your local device to shorten the bot runtime.

The system supports running only one bot for each device at a given time. If a bot is already running on the device, you cannot deploy another bot on the device.

- If you are running a bot from the Bot editor, closing the Control Room web browser will stop the bot run.
- Run-as user: A set of unattended Bot Runner users that a scheduler can select from to run a bot on a device. The run-as user can select an available device from the device pool to run the bot.

## Check in a bot

Check in the TaskBot files or folders to the public workspace from the private workspace to make it available for all users who have the permission to access and run the TaskBot.

- You must have a Bot Creator license.
- You must be assigned a custom role with the following permissions:
  - Required: Check-in permission at the folder level and at the corresponding parent folder level in the public workspace.
  - Optional: Create folder permission.
  - Optional: View packages permission.
- To check in a bot with dependent folders and files, ensure you have the following:
  - Create folder permission.
 

If you are checking in a bot from your private workspace and if the folder in which the bot is present does not yet exist in the public workspace, you must have create folder permission to successfully check in the bot.
  - Check in permission on the dependency folder.
- Ensure that your private and public workspaces have the same folder structure so that when you check in a bot from your private workspace, it will appear in the same folder structure in the public workspace.
- For example, if you check in a bot from the sample bot folder in the private workspace, it will appear in the sample bot folder in the public workspace.

If you want to check in multiple bots as a unit that are not dependent on each other, create a main bot and then add the other bots as dependencies to this main bot. Check in the main bot.

1. Log in to the Control Room as a Bot Creator user.
2. In the private workspace, click **Bots > My bots**.  
The **My bots** page is displayed with the list of folders or files containing the bots.

3. Select the bot you want to check in, click the actions menu (vertical ellipsis), and click **Check in Task Bot**.
4. In the **Check in Task Bot** window, add your comment and select the dependencies you want to check in and click **Check in**.  
The bot appears in the same folder structure in the public workspace. Directly referenced dependencies are automatically checked in.

---

**Note:**

- You cannot check in a TaskBot file if another TaskBot file already exists in the same location in the public workspace.
  - When you check in a bot along with a cloned bot and no other bots are dependent on the clone, the cloned bot is deleted.
- 

If you have issues in checking in a bot, see [Unable to check-in the bots in Automation 360 \(A-People login required\)](#).

## Check out a bot

Check out TaskBot files or folders from the public workspace to create an editable copy of the bot.

- Ensure you have the Bot Creator license to check out a bot to your private workspace.
- You must have check-out permission at the folder level.
- To check out a bot with dependent folders and files, you must have the check-out permission on the dependency folders.
- To cancel or undo a check-out performed by the Bot Creator user, you must have the **Cancel checkout** and **View content** permissions on public workspace.

You do not require the **Cancel checkout** permission to cancel the checked-out bot from the private workspace.

While checking out bot, keep the following considerations in mind:

- If you want to check out multiple bots as a unit that are not dependent on each other, create a main bot and then add the other bots as dependencies to this main bot. Check out the main bot.
- Only one user can check out a file at a time. When a user checks out a file, it cannot be checked out by any other user.
- If you are checking out a parent bot in the public workspace whose dependencies are checked out by another user, the dependencies of the parent bot will be cloned in your private workspace.
- If a bot is checked out, it cannot be deleted. The bot should be in a checked-in state to be deleted.
- When you edit a checked-out bot, the status changes to **Checked out edited**.

You can use the **Revert edits** option to revert changes you made to the checked-out bot.

- During check out, a cloned bot can be overwritten or replaced.

1. Log in to the Control Room as a Bot Creator user.
2. In the public workspace, click **Bots > My bots**.  
The **My bots** page is displayed with the list of folders or files containing the bots.

3. Select the bot, choose to either clone or check out the dependencies, open the actions menu (vertical ellipsis), and click **Check out Task Bot**.

The bot will appear in the same folder structure in the private workspace. When you check out TaskBot files or folders, all the dependencies linked to the TaskBot files or folders will either be checked out or cloned as per your choice.

---

**Note:** Only one user can check out a TaskBot at a time. When a user checks out a TaskBot, it cannot be checked out by any other user.

---

4. To cancel the checked-out bot, click the **Cancel check out Task Bot** option.

You can use this option from either the public or the private workspace.

In the public workspace, the bot status changes to public and the bot is available for check-out by another user with the appropriate permissions.

In the private workspace, the bot status changes to new if any changes were made to the bot. If there are no changes, the bot is replaced with a clone.

## Clone a bot

Create a read-only copy of the bot from the public workspace to the private workspace so that you can have a local copy without checking out the bot.

- Create a user with a Bot Creator license.
- Create a custom role with the clone permission assigned at the folder level to the user.
- To clone a dependency folder, you must have the clone permission on the dependency folder.

Cloning a bot does not affect other users' access to the bot in the public workspace. A bot can be cloned by multiple users.

1. Log in to the Control Room as a Bot Creator user.
2. In the public workspace, click **Bots > My bots**.  
The **My bots** page is displayed with the list of folders or files containing the bots.
3. Select the bot you want to clone, click the actions menu (vertical ellipsis), and click **Clone Task Bot**.  
The cloned bot appears in the same folder structure in the private workspace.

## Preload packages

You can preload packages on your local device to shorten the bot runtime.

When you run a bot, the system downloads the bot and all the packages used in the bot. Bot execution begins when the download finishes. If the packages used in the bot are preloaded, the system skips the package download process and starts executing the bot, thereby reducing the bot execution timeframe. Preloaded packages are stored in `\ProgramData\AutomationAnywhere\GlobalCache` on the local machine.

If there are multiple versions of a package, only the default package is preloaded. You can only preload packages on your local devices.

1. Log in with a Bot Creator account.
2. Click the **My Devices > Preload package** icon in the menu item associated with your local device.

---

**Note:** The **Preload package** option is also available from the device icon drop-down menu for Automation 360 (Cloud deployed) using the Google Chrome browser with the Chrome plug-in enabled.

---

3. In the **Preload packages** window, preload either all packages listed on the **Common packages** page, or select individual packages from the **Customize packages** page.  
Common packages represent the most lightweight and most commonly used packages.
4. Click the **Start preloading** option.

## Copy a bot

Copy a bot to create a duplicate sequence of actions within your private repository. The copy retains the meta-data of the original bot including captured images, recorded objects, called files, and child bots.

To copy a bot, follow these steps:

1. From Automation Anywhere web interface, select **Bots > My bots**.
2. Mouse over the actions menu.  
The actions menu is the vertical stack of three dots to the left of each bot.
3. Click the **Copy Task Bot** icon.
4. In the **Name** field, enter a name for the duplicate bot.

---

**Important:** Bot name must be unique. If a bot with the same name exists in the same folder location which you have access to in the public workspace, you will not be able to copy the bot with this name in the private workspace.

---

5. Optional: Click **Browse** to select the folder where to save the bot.
6. Click **Copy**.  
The duplicate bot appears in the specified folder.

## View TaskBot version history

View the history of the changes that have occurred in your TaskBots. You can identify actions performed by a user during a specific date and time along with check-in messages.

You must have check-in and check-out permissions.

You can view the version history of the TaskBots available in the public workspace and the private workspace (only if there are checked-out bots). However, there is no version history available for new and the cloned TaskBots.

1. Log in to the Control Room.
2. In the public workspace, navigate to **Bots > My bots**.  
The **My bots** page is appears with the list of folders or files containing the bots.
3. View the version history of TaskBots in the following ways:
  - Select the TaskBots for which you want to view version history. Hover over the actions menu (vertical ellipsis) located to the right of the TaskBots name and click **View history Task Bot**.
  - Click the bot name. When the bot open, click the vertical ellipsis at the top-right corner and select the **View history Task Bot** option.

A message appears listing all the versions of the selected bot in a sequence (latest revision on the top and the first revision is at the end). The information includes the version number, check-in message, checked-in date and time, and checked-in by username.

## Editing bots

Edit bot logic using the Bot editor to add, modify, or delete actions and automation steps.

### Open a bot

Open a bot in the Bot editor in one of the following ways:

- Select the bot and click **Edit**. The edit button is a pencil icon.
- Right-click on the bot and select **Edit**.
- Click **Actions** and select **Edit**.

## Attach work item template to TaskBot

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

When you attach a work item template to a TaskBot, you can use the variable **\$WorkItem\$** that contains the attributes for the required workload automation when you run the bot using the **Run bot with queue** option.

### *Use Work Item variables*

1. Create or edit a TaskBot from the **My bots** page.  
The TaskBot opens in edit mode.
2. Select the option **Work item template** from the menu at the top-right of the Workbench.  
The list of **Work item templates** appears.
3. Select the template that best suits your workload automation requirement.
4. Click the right arrow to add the template.  
The **Work item template attributes** are listed for the selected template.
5. Click **Save**.
6. Choose one of the following actions:
  - Click **Close** to return to the **My bots** page.
  - Click **Return to editor** to continue editing the TaskBot.

### **Related concepts**

#### [Workload management](#)

The workload management module enables users to upload Microsoft Excel and CSV files to the Control Room so that it feeds the records from the files into the bot deployments.

### **Related tasks**

#### [Use Work Item variables](#)

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

### **Related reference**

#### [Workload package](#)

The Workload package enables you to insert work items in a queue for workload automation. It also enables data chaining between multiple queues. You can orchestrate multiple bots, and enable optimal device utilization through the queuing mechanism of workload management.

## Viewing package versions available in the Control Room

Actions are grouped into version-specific packages. Bot Creators can select which package version to use for a specific bot.

Basic users can only view the packages available in the Control Room and the specific package details.

Bot Creators require the **AAE\_Basic** permission to select specific packages to use within a bot.

Go to the **Bots > Packages** page to view all the packages in the Control Room.

## Supported packages

**Important:** The package versions listed in the following table apply to the latest generally available (GA) release of Automation 360. For information about packages related to previous releases, see the PDFs for these releases: [Automation 360 previous release versions](#).

Package	Version
Active Directory	3.0.0-20210504-152747
Analyze	2.2.4-20210504-065343
App Integration	3.3.0-20210504-152753
Application	3.0.0-20210504-152755
Boolean	2.1.0-20210504-152757
Bot Migration	5.1.0-20210517-092432
Browser	3.0.0-20210505-201256
Clipboard	3.0.0-20210504-152804
Comment	2.6.0-20210504-152804
CSV/TXT	2.4.0-20210504-152806
Data Table	2.8.0-20210504-153459
Database	3.1.1-20210526-115136
Datetime	2.2.0-20210504-152815
Delay	3.0.0-20210504-152816
Dictionary	3.3.0-20210504-152817
Email	3.6.0-20210504-084515
Error handler	2.6.0-20210504-152835
Email Trigger	2.1.0-20210422-095539
Excel basic	2.8.0-20210504-153127
Excel advanced	5.7.0-20210419-191213
File	4.0.0-20210504-152837

Package	Version
File/Folder Trigger	1.1.0-20210426-170715
Folder	4.0.0-20210504-152839
FTP / SFTP	2.3.0-20210504-152842
Google Calendar	2.1.0-20210419-191626
Google Drive	2.1.0-20210419-191629
Google G Suite	2.1.0-20210419-191623
Google Sheets	2.1.0-20210419-191633
Hotkey Trigger	1.0.0-20200624-103826
If	3.0.0-20210504-152844
Image Recognition	3.0.0-20210504-152847
Interactive Forms	2.21.1-20210512-062529
Interface trigger	1.1.0-20210426-170716
IQ Bot	2.0.3-20210505-064113
IQ Bot [Local Device]	4.0.0-20210519-133404
IQ Bot Pre-processor	2.2.0-20210426-094228
JavaScript	2.7.0-20210504-152923
Simulate keystrokes	3.0.0-20210503-135702
Legacy Automation	4.0.0-20210512-093900
List	2.3.0-20210504-152938
Log To File	3.0.0-20210504-152939
Loop	3.0.0-20210504-152940
Message Box	3.0.0-20210504-152941
Mouse	2.3.0-20210427-194655
Number	3.0.0-20210504-153002
OCR	2.4.0-20210504-153004
Office 365 Calendar	2.3.0-20210504-084449
Office 365 Excel	2.4.0-20210504-084902
Office 365 OneDrive	2.3.0-20210504-084910
PDF	3.0.0-20210504-153115
PGP	2.3.0-20210504-153117
Ping	3.0.0-20210504-153119
Play Sound	2.2.0-20210504-101410
Process	3.2.1-20210527-014325
Process Discovery	2.0.10-20210526-200433

Package	Version
Printer	2.1.0-20210504-153135
Prompt	2.2.0-20210405-141524
Python Script	2.7.0-20210504-153138
Recorder	2.2.0-20210507-195346
REST Web Service	3.4.0-20210504-153429
Run DLL	5.0.0-20210426-170653
SAP	2.4.0-20210504-153434
SAP BAPI	2.1.0-20210504-153439
Screen	2.2.0-20210504-153440
Services	4.0.0-20210504-153442
SNMP	2.1.0-20210504-153444
SOAP Web Service	3.3.0-20210517-154853
Step	2.0.2-20210504-153452
String	4.1.0-20210427-194725
System	3.3.0-20210419-071503
Task Bot	2.0.1-20210503-140009
Terminal Emulator	4.1.0-20210504-153505
Trigger Loop	0.5.0-20210426-170656
V11 Task Bot	1.6.0-20210504-152936
VBScript	2.7.0-20210504-153509
Wait	4.0.0-20210504-153512
Window	3.0.0-20210504-085135
Workload	2.7.0-20210504-153515
XML	3.1.0-20210504-153517

## Select the package version used in your bot

As a Bot Creator you have the ability to select which package version to use for a set of actions within your bot.

You need to have **AAE\_Basic** permission.

---

**Tip:** For existing bots, follow these steps to update to the default package.

---

1. Open or create a new bot from **Bots > My bots**.
  2. Click the vertical ellipses in the upper right corner, and select **Packages**.
- 

**Note:** The packages used in the selected bot are highlighted.

---

3. Click the drop-down list to view which version of the package is currently used for this bot.

4. To change the package version to be used for this bot, select the package version to use from the drop-down list of available packages.
5. Click **Change version**.
6. Click **Save**.

## Set automation priority for your bots

Set the automation priority of your bots to high, medium, or low so that higher-priority automations are processed first for deployment. This enables you to meet your business SLA (service-level agreement) for resource optimization.

- You must have a Bot Creator license.

You can set the automation priority when you create and edit a bot.

1. Log in to the Control Room as a Bot Creator user.
2. In the private workspace, select a bot for which you want to set the priority. The bot is opened in edit mode.
3. Select **Advanced settings** from the actions menu (three vertical ellipsis).
4. Set the **Automation priority** to high, medium, or low based on your requirements. The default permission is set to medium.
5. Return to the bot editor and save the bot.

## Keyboard shortcuts

List of keyboard shortcuts supported.

### All modes - Flow or List view

Keys	Action
Esc	Closes node details or clear cursor
Tab	Toggles Flow or List view
Enter	Shows node details and focus first input
Space	Toggles node details
Ctrl A	Selects all nodes

### All modes - Flow view

Keys	Action
Up	Moves cursor up
Down	Moves cursor down
Left	Moves cursor left

Keys	Action
Right	Moves cursor right

### All modes - List view

Keys	Action
Up	Moves cursor up
Down	Moves cursor down

### Edit mode

Keys	Action
Ctrl S	Saves file
F5	Run
F10	Enters debug mode
Shift F9	Toggles all breakpoint

### Edit modes - Flow or List view in focus

Keys	Action
Ctrl Shift R	Starts recording
Ctrl /	Enables or disables mode
F9	Toggles node breakpoint
Ctrl C	Copy node
Ctrl X	Cut node
Ctrl V	Paste node
Delete	Delete node
Ctrl Z	Undo
Ctrl Y	Redo

### Debug mode

Keys	Action
F5	Play/pause/restart
F6	Step next

Keys	Action
F7	Stop
F10	Exits debug mode
Shift F9	Toggles all breakpoints

### Debug mode - Flow or List view in focus

Keys	Action
F9	Toggles node breakpoints

### Node details

Keys	Action
Ctrl Enter	Accepts current input and saves the action or trigger

## Variables overview

Automation 360 offers a variety of variables, each designed to hold specific types of data and is intended for specific use. Use the topics below to learn more about each variable and how to use them.

#### *Credentials and credential variables in the Bot editor*

Use credentials when building bots to pass sensitive information such as passwords and account numbers. Using credentials separates the sensitive information from the bots and Bot Runners, which reduces the risk of data spillage or unauthorized user access.

#### *Predefined variables*

Predefined variables are predefined variables that return specific values about the machine on which the bot is executed. Users cannot edit the values of a predefined variable.

#### *Your variables (user-defined)*

Users and some actions create user-defined variables to temporarily hold values. Use this kind of variable to input values into an action (window title, login credential, or file path) or to accept the output of an action (values read from a file or a Boolean return).

#### *Create a variable*

#### *Global values*

Global values enable users to reuse identical values between bots instead of creating new variables for each bot. A user with the `AAE_admin` role configures a global value with a default value and can enable non-admin users to overwrite the value to use in their bots.

### Work Item variables

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

Watch the following video on how to use variables:

To learn more, search for the *Did You Know that You can Build Powerful Automation Using Variables and Advance Data Type Commands?* course in [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#).

## Predefined variables

Predefined variables are predefined variables that return specific values about the machine on which the bot is executed. Users cannot edit the values of a predefined variable.

Predefined variable types include clipboard, date time, string and system settings and parameters.

### Clipboard

Use the actions in the Clipboard package to perform operations on the clipboard variable. See [Clipboard package](#).

Variable	Description
<i>Clipboard</i>	Returns the contents of the clipboard.

### Date time

Use the actions in the Datetime package to perform operations on the date time variables. [Datetime package](#)

Variable	Description
<i>Date</i>	Returns the date including hours, minutes, and seconds.  <b>Note:</b> Hours can be in 24-hour or AM/PM format depending on the machine configuration.
<i>Day</i>	Returns the day in DD format.
<i>Hour</i>	Returns the hours in HH format.
<i>Machine</i>	Returns the device name as a string.
<i>Millisecond</i>	Returns the milliseconds with a value between 0 and 999.
<i>Minute</i>	Returns the minutes in MM format.
<i>Month</i>	Returns the month in MM format.
<i>Second</i>	Returns the seconds in SS format.
<i>Year</i>	Returns the year in YYYY format.

## String

Use the following variables to change how a string is displayed.

Variable	Description
<i>Enter</i>	Starts a new line based on the operating system of the device. For example, the variable always adds a new line in Linux CentOS. In Microsoft Windows, the variable adds a page break in the Microsoft Word application and a new line in the Notepad application.
<i>Newline</i>	Starts a new line regardless of the application and operating system of the device.
<i>Separator</i>	Demarcates a separation between values with a <sep> value.
<i>Tab</i>	Creates large space.

## System settings and parameters

Use the following variables to return data from the computer that is connected to the running Bot agent:

Variable	Description
<i>AAControlRoom</i>	Returns the URL of the Control Room.
<i>AAInstallationPath</i>	Returns the Bot agent installation path. For example, C:\Program Files\Automation Anywhere\Bot Agent.
<i>AATaskExecutor</i>	<p>Returns details on the Run-as user that is used to run a bot. If the bot is deployed on an attended Bot Runner, this variable returns information about the logged-in user. If the bot is deployed by a trigger, this variable returns information about the user associated with that Bot Runner license.</p> <p>This variable is a dictionary with the following keys:</p> <ul style="list-style-type: none"> <li>• <code>Executor_UserName</code></li> <li>• <code>Executor_FirstName</code></li> <li>• <code>Executor_LastName</code></li> <li>• <code>Executor_Email</code></li> </ul>
<i>AATaskInvoker</i>	<p>Returns details on the user that deployed the bot either by running or scheduling the bot. If the bot is deployed to an attended Bot Runner, this variable returns information about the logged-in user. If the bot is deployed by a trigger, this variable returns information about the user who set the trigger.</p> <p>This variable is a dictionary with the following keys:</p> <ul style="list-style-type: none"> <li>• <code>Invoker_Email</code></li> <li>• <code>Invoker_FirstName</code></li> <li>• <code>Invoker_UserName</code></li> <li>• <code>Invoker_LastName</code></li> </ul>
<i>AATaskName</i>	Returns the path and name of the currently running TaskBot. For example, /Bots/Finance/combineSheets.atmx.

Variable	Description
<i>CPUUsage</i>	Returns the percentage utilization of the CPU. Use this variable in a <b>Wait for condition</b> action to make the bot wait until machine CPU usage decreases to a specific amount. See <a href="#">Wait package</a> .
<i>Machine</i>	Returns the name of the computer.
<i>RAMUsage</i>	Returns the RAM usage in megabytes. Use this variable in a <b>Wait for condition</b> action to make the bot wait until machine RAM usage decreases to a specific amount. See <a href="#">Wait package</a> .
<i>OSName</i>	Returns the operating system. For example, Windows 10 64-bit.
<i>TotalRAM</i>	Returns the total amount of RAM available.

- Version 11.3 contained Email, File, and PDF system variables, which could hold a limited number of properties values. In Automation 360, an infinite amount of Email, File, and PDF properties values are stored in User-defined Dictionary variables. For more information, see [Using dictionary variable for email properties](#) and [Using a dictionary variable for PDF properties](#).
- Version 11.3 contained Excel system variables to return the cell, column, or row location. In Automation 360, the Excel Advanced package contains the following actions to return location values: [Get cell address](#), [Get column](#), and [Get row](#).
- Version 11.3 contained the Counter system variable to return the loop iteration count. In Automation 360, the user must create and configure a number variable.

## Your variables (user-defined)

Users and some actions create user-defined variables to temporarily hold values. Use this kind of variable to input values into an action (window title, login credential, or file path) or to accept the output of an action (values read from a file or a Boolean return).

### Variable types

The variable type dictates what kind of data the variable holds. Most variable types have a package with a similar name, which contains actions used to perform operations on the values stored in the variable. For example, use the actions in the String package to work on String variables. Similarly, to work on Number variables, use the actions in the Number package.

### Variable naming

A variable name can contain a maximum of 50 Unicode characters, including numbers (0-9), Latin letters (A-Z, a-z), and special characters (- and \_). You can use double-byte characters, such as Chinese, Japanese, or Korean characters, in a variable name. [Unicode range supported in variables](#)

We recommend using camel case for variable names and prefixing the variable name to indicate the scope and data type. For example, `iFileEmailAttachment` for a file type variable that is used to provide an input. For more information about scope, see [Task Bot package](#). This standard enables you to search for variables by type. For example, `oStr` returns variables that are used to hold output string values.

## Variable types

Variable type and suggested name	Description	Use examples
Any <i>Any</i>	Stores Boolean, Data table, Datetime, File, Number, Record, String, or Window data types. Use this variable type when you are uncertain of which data type an action will output.	<a href="#">Example of using the Run action</a>
Boolean <i>Bool</i>	Stores either a True or False value.	
Credential <i>Cred</i>	Stores string values securely, preventing values from being displayed in a message box or written to a file. The value is either selected from the Credential Vault or is user-provided.  <a href="#">Credentials and credential variables in the Bot editor</a>	
DateTime <i>Date</i>	Stores a value containing a single date and time value.	You can format the values by selecting a predefined format or specifying a custom format.  <a href="#">Date time formats</a>
Dictionary <i>Dict</i>	Stores data in the form of key-value pairs. The value can be boolean, number, or string.	<ul style="list-style-type: none"> <li>• <a href="#">Using dictionary variable for email properties</a></li> <li>• <a href="#">Using a dictionary variable for PDF properties</a></li> </ul>
File <i>File</i>	Stores a file path.	
Form <i>Form</i>	Stores the value that was input into an interactive form field.  <a href="#">Using interactive forms</a>	
List <i>List</i>	Stores a sequence of boolean, number, or string values.	

Variable type and suggested name	Description	Use examples
Number <i>Num</i>	Stores numeric values, including integers and decimals. It holds values from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807, and up to 15 decimal digits.  You can assign a randomly generated value to this variable.  <i>Random number action</i>	You can remove the digits following a decimal when converting the value into a string.  <i>Number to string action</i>
Record <i>Rec</i>	Stores a single row of values extracted from a table. The values can be boolean, datetime, number, or string.  <i>Record variable</i>	<i>Example of entering data into a web form from a worksheet</i>
Session <i>Sess</i>	Stores the session name from the Excel basic, Excel advanced, or Terminal Emulator packages. Pass this variable from a parent to a child bot in the <b>Task bot &gt; Run</b> action to enable the child bot to process the data in the file opened in the parent bot.  <hr/> <b>Note:</b> When initializing this variable in the child bot, select <b>Use as input</b> .	<i>Example of sharing an Excel session between bots</i>
String <i>Str</i>	Stores alphanumeric and special characters, and empty values. It can hold up to 65535 UTF-8 characters. A string variable can hold multiple lines of text.	You can compare the value in a String variable to an empty String variable.  <i>Example of using a conditional statement</i>
Table <i>Table</i>	Stores multiple values in a table of rows and columns. The values can be boolean, datetime, number, or string.	Assign values to a table variable by extracting values from a <i>CSV/TXT file</i> , <i>Excel file</i> , or a <i>Web form</i> .
Window <i>Table</i>	Stores a window title and URL.	Some actions, such as the Capture action, create a Window variable to store the specified window title and URL.  <i>Example of extracting data from a web table</i>

## Delete variables

You can delete user-created variables in either of the following ways:

- **Delete one variable:** In the **Variables** palette, click the vertical ellipsis to the right of the variable name and click **Delete variable**.
- **Delete unused variables:** In the **Variables** palette, click **Delete unused variables**, select which variables to delete, and click **Delete**.

### Related tasks

#### [Create a variable](#)

Create a variable to store values.

### Related reference

#### [Boolean package](#)

The **Boolean** package contains actions that enable you to do various operations on Boolean values.

#### [Data Table package](#)

The Data Table package contains actions that enable you to perform various operations on the values of table variables. Use these actions to join or merge content, search for specific values, insert rows and columns, remove duplicate rows, and write values to a file.

#### [Datetime package](#)

A datetime value consists of a date, time, and time zone. RPA Workspace stores datetime values in a Datetime variable. The **Datetime** package contains actions that enable you to perform various operations on datetime values. You can use these actions to manipulate and compare values in the Datetime variables.

#### [Dictionary package](#)

The **Dictionary** package contains actions that enable you to do various operations on dictionary-type values.

#### [List package](#)

The **List** package contains actions that enable you to perform various operations on a variable of the list data type.

#### [Number package](#)

The Number package contains actions that enable you to perform various operations on a number variable. A number variable holds numeric values, including integers and decimals. It holds values from -9,223,372,036,854,775,808 to 9,223,372,036,854,775,807, and up to 15 decimal digits.

#### [String package](#)

Use the **String** package to perform various operations such as comparing two strings, retrieving the string length, or converting a string to uppercase or lowercase.

#### [Type casting](#)

You can temporarily convert the values inside a Boolean, Number, or String variable from one type to another type to use within one action. For example, use `$(YourStringVariable).String:toNumber` to convert the value of a string variable to a number variable to perform mathematical operations.

#### [Recursive expressions](#)

Use a recursive expression to insert a variable in the place of an index or key of a dictionary, list, record, or table variable.

## Create a variable

Create a variable to store values.

To create and configure a variable, follow these steps:

1. From the Bot editor, click the **Create variable** icon at the top of the **Variables** menu. The **Variables** accordion menu is located below the **Actions** menu.
2. In the **Create variable** window, enter a descriptive name for the variable that is prefixed by a lowercase letter to indicate the variable type. For example, `sCellValue` to indicate a string data type.

**Note:**

- You can use double-byte characters, such as Chinese, Japanese, or Korean characters, in a variable name. [Unicode range supported in variables](#)
- Variables cannot be named Java keywords such as String, Boolean, Integer, Public, and Finally.

**3.** Optional: Enter a description.

**Recommendation:** Provide meaningful variable description when defining input or output variables.

**4.** Optional: Select the **Constant (read-only)** option to ensure values cannot be edited or overwritten.**5.** Select from the following options:

This field pertains to using a bot to run other bots. See [Task Bot package](#).

- **Use as input:** The variable holds a value that can be passed from the parent bot to a child bot. (Applicable only to a child bot).
- **Use as output:** The variable holds a value that can be passed from a child bot to the parent bot. (Applicable only to a child bot).
- **Both:** The value can be passed in both directions.
- **Neither:** The variable is confined to this bot; it cannot be shared across other bots.

**6.** Select a data type from the drop-down list.

For more information on data types, see [Variable types](#).

**7.** Optional: Enter a default value to assign to the variable.

The values are NULL/empty by default.

**8.** Click **Create**.

The variable appears in the Variables pane on the left side of the Bot editor.

**9.** To insert a variable into an action field, perform one of the following actions:

- Click F2 to open the variables list.
- Click the **Insert a value** icon, located on the right side of the field.
- Enter the variable name. As you type, the field generates suggestions of existing variables.

**Note:** Add a dollar sign at the start and end of the variable. For example, `$myVariableName$`.

[Build a Go be Great bot](#): Follow the steps in this procedure for an example of how to create a variable and assign it to an action.

## Type casting

You can temporarily convert the values inside a Boolean, Number, or String variable from one type to another type to use within one action. For example, use `$<YourStringVariable>.String:toNumber` to convert the value of a string variable to a number variable to perform mathematical operations.

In the text field, enter `$<variable name>..` After you enter the period, the auto-fill suggests possible actions such as `toNumber`.

Variable type	Type casting options
Boolean	<ul style="list-style-type: none"> <li>• <b>invert</b>: Converts the Boolean value to the opposite value (True to False and False to True).</li> <li>• <b>toNumber</b>: Converts the Boolean value to a numeric value (True to 1 and False to 0).</li> <li>• <b>toString</b>: Converts the Boolean value to a string value.</li> </ul>
Number	<ul style="list-style-type: none"> <li>• <b>decrement</b>: Decreases the number value by one.</li> <li>• <b>increment</b>: Increases the number value by one.</li> <li>• <b>toString</b>: Converts the number value to a string value.</li> </ul>
String	<ul style="list-style-type: none"> <li>• <b>length</b>: Returns the number of characters in the string as a numeric value.</li> <li>• <b>lowercase</b>: Converts the characters in the string to lowercase.</li> <li>• <b>reverse</b>: Reverses the characters in the string.</li> <li>• <b>toBoolean</b>: Converts the string value to a Boolean value.</li> <li>• <b>toNumber</b>: Converts the string value to a number value. The limits of the <b>String to Number</b> action apply here.</li> </ul> <p>See <a href="#">String to number action</a>.</p> <ul style="list-style-type: none"> <li>• <b>trim</b>: Trims blanks and whitespaces from the string.</li> <li>• <b>uppercase</b>: Converts the characters in the string to uppercase.</li> </ul>

---

**Note:** Type casting is not supported for the following scenarios:

- As a value that is passed between bots.
- As a property value for an object captured with the Universal Recorder.

*Object properties*

---

## Recursive expressions

Use a recursive expression to insert a variable in the place of an index or key of a dictionary, list, record, or table variable.

A recursive expression contains a variable nested inside of another variable (the outer variable). The value of the outer variable is conditional based on the value of the nested variable.

For example, the list variable `$listOfPlanets$` has the following values: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The Number variable `$indexPosition$` has value of 2. The expression `$listOfPlanets[$indexPosition$]` returns Earth.

The following types of expressions are supported. You can create a recursive expression containing up to 10 expressions.

- `$dictionaryVariable{$key}$`
  - `$listVariable[$index]$`
  - `$recordVariable[$index]$`
  - `$tableVariable[$rowIndex][$columnIndexOrName]$`
- 

**Note:**

- You cannot use a Table variable within a List variable. For example, the following expression is not supported: `$vListStr[$vTable[0][0]$]`
- You cannot combine expressions with properties. For example, the following expression is not supported: `$dictionaryVar{$listStrVar[2]$}.String:reverse$`

---

## Record variable

A record variable holds a row of data extracted from a database, spreadsheet, or table in name-field pairs. The fields can store values of Boolean, datetime, number, or string data type.

### Working with a record variable

Record variables are commonly used in the loop action to store a single row of retrieved data; you can access a single value by specifying the index number or name. The index number is the position of the name-field pair. The name is either configured when the variable is initialized or it can be extracted from the column headers of the source table.

The following is an example table:

CustomerName	City
Dana	Pittsburgh
Sam	Los Angeles
Alex	Boston

In this example, a bot loops through the preceding table and assigns each row to `rCurrentRow`. To retrieve the value from the first column of each row, use either the index number `$rCurrentRow[0]$` or name `$rCurrentRow{CustomerName}$`.

---

**Note:** To retrieve a date time value from a record variable and use it as a string, concatenate the record variable with a string value in the action field.

---

## Schema

A schema is like a template for the record fields. It sets the order of the fields and the type of data that can be entered into each field.

If you select the **Set schema** option when creating a new record variable, the following conditions apply at runtime, where the bot retrieves a row of data and stores it to a record variable:

- The retrieved values must match the configured field data types.

For example, the data set [{"name": "Sally"}, {"id": 002}, {"dob": "03/05/1989"}] can be assigned to a record variable with the schema [{"name": String}, {"id": Number}, {"dob": Date}].

- The data set attributes must follow the same order and capitalization.

For example, the data set [{"name": "Henry"}, {"id": 003}, {"dob": "06/13/2001"}] cannot be assigned to a record variable with the schema [{"id": Number}, {"name": String}, {"dob": Date}] or {"Name": String}, [{"ID": Number}, {"DOB": Date}].

- The record variable can accept a superset of the configured fields if the fields are in the same order.

For example, the data set [{"name": "Alex"}, {"id": 004}, {"dob": "12/10/1995"}, {"pet": "yes"}] can be assigned to a record variable with the schema [{"name": String}, {"id": Number}, {"dob": Date}].

- The record variable does not accept a subset of data.

For example, the data set [{"id": 005}, {"dob": "05/21/1975"}] cannot be assigned to a record variable with the schema [{"name": String}, {"id": Number}, {"dob": Date}].

If the bot encounters a row of data that does not meet the record variable schema, the bot fails. This prevents the bot from passing incorrect or invalid data into the next action.

## Unicode range supported in variables

Review the valid characters that can be used in a variable name.

Language	Characters	Range
Arabic		U+0600 - U+0605, U+0620 - U+0669, U+066E - U+06D3
CJK ideographs	Common	U+4E00 - U+9FEA
	Extension A	U+3400 - U+4DB5
	CJK compatibility ideographs	U+F900 - U+FA6D
Chinese	Chinese Kanji	See CJK ideographs

Language	Characters	Range
Greek		U+0370 - U+0374, U+0376 - U+0377, U+037A - U+037D, U+037F - U+0386, U+0388 - U+038A, U+038C, U+038E - U+03A1, U +03A3 - U+03F5, U+03F7 - U+03FF, U+1F00 - U+1F15, U+1F18 - U+1F1D, U+1F20 - U+1F45, U+1F48 - U+1F4D, U+1F50 - U+1F57, U+1F59, U +1F5B, U+1F5D, U+1F5F - U+1F7D, U+1F80 - U+1FB4, U+1FB6 - U+1FBC, U+1FBE, U+1FC2 - U+1FC4, U+1FC6 - U+1FCC, U+1FD0 - U+1FD3, U+1FD6 - U+1FDB, U+1FE0 - U+1FEC, U+1FF2 - U+1FF4, U+1FF6 - U+1FFC
Japanese	Hiragana	U+3041 - U+3096, U+309D, U+309E
	Katakana	U+30A1 - U+30FA, U+30FC
	Kanji	See CJK ideographs
	Double-byte numbers	U+FF10 - U+FF19
Korean	Hangul Syllables	U+AC00 - U+D7A3
Latin	a-z	U+0061 - U+007A
	A-Z	U+0041 - U+005A

Language	Characters	Range
Latin extended (Czech, Danish, Dutch, Finnish, French, German, Hungarian, Italian, Norwegian, Polish, Portuguese, Romanian, Spanish, and Swedish)	Latin-1 supplement	U+00C0 - U+00D6, U+00D8 - U+00F6, U+00F8 - U+00FF
	Latin Extended-A	U+0100 - U+017F
	Latin Extended-B	U+0180 - U+024F
	Latin Extended-C	U+2C60 - U+2C7F
	Currency symbols	U+20AC
Numbers	0-9	U+0030 - U+0039
Russian	Cyrillic	U+0400 - U+0481, U+0483 - U+0487, U+048A - U+04FF
Special characters	Hyphen (-) and underscore (_)	U+002D, U+005F

## Use Work Item variables

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

The Work Item variables are available in a TaskBot only after you attach a work item template to the TaskBot when you define the work item template in the work item structure during queue creation.

*Attach work item template to TaskBot*

1. Go to the **My bots** page.
2. Click **Create a bot**.
3. In the **Create a Taskbot** window, enter the required parameters such as **Name**, **Description**, and **Folder** location.
4. Click **Create & edit** to open the TaskBot in edit mode.
5. Attach the bot to a queue category by selecting a **Work item template**.

*Attach work item template to TaskBot*

6. Press the function key F2 to open the **Insert a variable** window and add the following Workload variables to an action:
- a) **workItem** to view the default values or attributes of the Work Item when you run the TaskBot using the **Run bot with queue** option.  
The **workItem** is an input variable for debugging a Workload bot to be used for TaskBot deployment options **Run now** and **Schedule a bot**. You can add the values for the **workItem** variable when you create an automation.  
On the other hand, when you use the option **Run bot with queue**, the **workItem** variable uses the values passed on by the Control Room.
  - b) **workItemResult** to set the final outcome of the Work Item when you run the TaskBot using the **Run bot with queue** option.  
Use the **String > Assign action** to set the value of **workItemResult** variable. This is an output variable type and you can use the string values as well as other variables to set the value of **workItemResult** variables.

The variables are read-only and therefore cannot be edited or deleted from the TaskBot editor page. Double click a variable in the **Variables** panel to view the variable parameters:

- Variable name.
- Description of the variable.
- Read only if the Constant check box is selected when the variable was created.
- To be used as input or output parameter in a TaskBot during run time.
- Variable type.
- The default values or attributes that are configured with the Work Item template for a **workItem** variable or the default output values for a **workItemResult** variable.

### Related concepts

#### [Workload management](#)

The workload management module enables users to upload Microsoft Excel and CSV files to the Control Room so that it feeds the records from the files into the bot deployments.

### Related tasks

#### [Define Work Item structure](#)

Define the Work Item structure for processing in a queue. This enables you to manually upload the Work Items from the system in the absence of ready data in a file.

#### [Attach work item template to TaskBot](#)

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

### Related reference

#### [Workload package](#)

The Workload package enables you to insert work items in a queue for workload automation. It also enables data chaining between multiple queues. You can orchestrate multiple bots, and enable optimal device utilization through the queueing mechanism of workload management.

## Credentials and credential variables in the Bot editor

Use credentials when building bots to pass sensitive information such as passwords and account numbers. Using credentials separates the sensitive information from the bots and Bot Runners, which reduces the risk of data spillage or unauthorized user access.

### Credential

A credential holds the sensitive information in attributes. An attribute can have a value that is standard for all users or it can accept a user-input

value. For example, an `Email` credential can hold three attributes: `host name` (standard value), `username` (user input), and `password` (user input).

Credentials are predefined in the **CREDENTIALS** tab and cannot be modified when the user is building or running a bot.

By default, all users can create, manage, and use their own credentials. A user is granted access to another user's credentials by receiving access to a locker that holds the credential. If the credential requires a user-input value, it appears in the **CREDENTIAL REQUESTS** tab.

A credential must be assigned to a locker to be used for building and running a bot.

### Locker

A locker specifies which users can view, modify, or access the credentials. For example, a human resources (HR) locker can hold `Email`, `Database`, and `Training website` credentials and allow only specific employees of the HR department to use the credentials in their bots.

### Credential variable

A credential variable stores a credential value in a user-defined variable. It enables users to securely pass values to a bot and from a bot to another bot. Using a credential variable ensures that the values are not displayed in a message box or written to a file. The value is either selected from the Credential Vault or is provided by the user. You can use it into any action field that accepts a variable.

---

**Note:** Values of this data type cannot be converted to another data type.

---

You can:

- Pass login credentials to a child bot.
- Retrieve confidential data, such as account numbers, and pass them to the main bot.

---

**Note:** You cannot pass credential values to the main bot when you deploy it from the **Run bot now** page. The values must be hard-coded in the bot or selected from the Credential Vault.

---

## Working with credentials

- Only fields with a **Credential** tab below the field name accept a credential.
- Action fields display the locker, credential, and attribute name; users can not see attribute values in the Bot editor.
- A credential cannot be appended to other variables or to a string.

**Related tasks**[Create credential](#)

Create a credential and add the required attributes.

[Edit a credential](#)

Modify credential details and add or remove attributes.

**Example of building a bot that uses credentials**

Build a bot that securely logs in to an online bank using credentials from Credential Vault, ensuring that the username or password is not stored in the bot or on the device.

- Credentials must be assigned to a locker to be used in a bot.
- You must have **Consumer** permissions to the locker.

If the email notification setting is enabled, you receive an email that confirms the locker name and your permissions to that locker.

In this example, you configure a credential with user-provided values and build a bot to automate logging into an online bank website.

1. Provide the user-input values.
  - a) Navigate to **BOTS > Credentials > CREDENTIAL REQUESTS**.  
The credentials that require a user-provided value have an incomplete icon in the first column.
  - b) Click the credential that holds the bank login credentials.
  - c) Click **Edit**.
  - d) Enter the attribute values for the username and password and click **Save changes**.
2. Open a new bot.
  - a) From Automation Anywhere web interface, select **BOTS > My bots**.
  - b) Click **Create new > Bot**.
  - c) Enter a bot name and click **Create and edit**.
3. Open the browser to the bank login page.
  - a) Double-click or drag the **Browser > Launch website** action.
  - b) Enter the URL.  
For example, `www.examplebank.com/login`.
  - c) Select your preferred browser.
  - d) Click **Save and Run**.  
The bank website opens in a new window. If the website opens in a new tab, drag it into a separate window.
4. Specify the username text box.
  - a) Double-click or drag the **Recorder > Capture** action.
  - b) From the **Object detail** menu, select the window containing the bank website.
  - c) Click **Capture object**.  
The window containing the bank website is activated.
  - d) Hover over the username text box and click when a red outline appears.
  - e) In the Object properties table, verify that the Control Type is a textbox.
  - f) From the **Action** menu, select **Set text**.

- g) Select the **Select a credential** option and click **Pick** to navigate to the credential.  
The **Pick a credential** window appears.
  - h) Select the **Locker, Credential,** and **Attribute** for the bank website username and click **Confirm.**
5. Repeat Step 4 to specify the password text box.
  6. Specify the Log on button.
    - a) Double-click or drag the **Recorder > Capture** action.
    - b) From the **Object detail** menu, select the window containing the bank website.
    - c) Click **Capture object.**  
The window containing the bank website is activated.
    - d) Hover over the Log on button and click when a red outline appears.
    - e) In the Object properties table, verify that the Control Type is a button.
    - f) From the **Action** menu, select **Click.**
  7. Close the window containing the bank website.
  8. Click **Save** and **Run.**

#### *Example of building a bot that uses credential variables*

Perform the steps in this task to learn how to pass values securely between bots.

#### **Related reference**

##### [Recorder package](#)

Use the **Capture** action from the Recorder package to capture an interaction with a user interface (UI) object such as a text box, button, table, menu, radio button, combo box, check box, list view, link, tree, and page tab.

##### [Credentials and credential variables in the Bot editor](#)

Use credentials when building bots to pass sensitive information such as passwords and account numbers. Using credentials separates the sensitive information from the bots and Bot Runners, which reduces the risk of data spillage or unauthorized user access.

## Example of building a bot that uses credential variables

Securely pass values to a bot using credential variables to automate the process of logging in to a bank website.

Complete the steps in the following task to build the child bot that automates logging in to a bank website:

#### *Example of building a bot that uses credentials*

This task is performed by the user who wants to build and deploy . You must have the necessary rights and permissions to complete this task, and authorization to log in to the as the licensed user.

In this example, you modify the bot to accept credentials passed from a parent bot.

In the bot that you built for [Example of building a bot that uses credentials](#), create two credential variables and insert them into the **Recorder > Capture** actions.

1. Configure the credential variable to hold the username.

Field	Input
<b>Name</b>	username
<b>Use as input</b>	select
<b>Type</b>	Credential

Field	Input
<b>Default value</b>	Insecure string, leave field empty

2. Configure the credential variable to hold the password.

Field	Input
<b>Name</b>	password
<b>Use as input</b>	select
<b>Type</b>	Credential
<b>Default value</b>	Insecure string, leave field empty

3. Modify the first **Recorder > Capture** action.
- Click the action to open it in the action editor.
  - In the **Select a credential** field, select the **Variable** tab.
  - Click F2 to open the Variables menu and select \$username\$.
  - Click **Yes, insert**.
4. Repeat the substeps in step 3 to insert the \$password\$ variable into the second **Recorder > Capture**.
5. Click **Save** and **Close**  
The **My bots** page appears.

Create a parent bot that will run the child bot and pass it the credential values.

6. Open a new bot.
- Click **Create new > Bot**.
  - Enter a bot name and click **Create and edit**.
7. Insert a **Task Bot > Run** action to select the bot and provide the login credentials.
- Double-click or drag the **Task Bot > Run** action.
  - In the **Task Bot to run** field, select the **Control Room file** tab.
  - Click **Browse** and select the bot that you modified in the above steps.
  - In the **Input values** options, select both **Set username** and **Set password**.
  - For each credential variable, click **Pick** to select the locker, credential, and attribute.
8. Click **Save** and **Run**.

### Related tasks

[Create a variable](#)

Create a variable to store values.

### Related reference

[Task Bot package](#)

Use the **Run**, **Pause**, and **Stop** actions in the Task Bot package to manage running one or more child bots from a parent bot or with a third-party software using an API.

[Credentials and credential variables in the Bot editor](#)

Use credentials when building bots to pass sensitive information such as passwords and account numbers. Using credentials separates the sensitive information from the bots and Bot Runners, which reduces the risk of data spillage or unauthorized user access.

## Global values

Global values enable users to reuse identical values between bots instead of creating new variables for each bot. A user with the `AAE_admin` role configures a global value with a default value and can enable non-admin users to overwrite the value to use in their bots.

## Data types

Data type	Description
DateTime	Stores a value containing a single date and time value.
Number	Stores numeric values, including integers and decimals. It can hold up to 15 decimal digits.
String	Stores alphanumeric and character values.

## Working with global values

Users can perform the following tasks:

- Create a global value as an admin  
*Create a global value*
- Update the default value as a non-admin  
*Overwrite the default value*
- Delete a global value

A user with the **AAE\_Admin** role can delete a global value by hovering over the vertical ellipsis to the right of the value, and clicking the **Delete** icon. When a global value is deleted, any overridden values for that global value are also deleted.

- Insert global values into bots

All action fields that accept a user-created variable accept a global value. Insert a global value into an action field by pressing F2 or by clicking the **Insert a value** icon on the left side of the field.

## Create a global value

As a user with the `AAE_admin` role, you can create a global value, configure the data type, set the default value, and enable the value to be updated by non-admin users.

1. Navigate to **BOTS > Global values**.  
The **All global values** page appears with a table of global values.
2. Click **Create global value**.

3. Enter a descriptive name of up to 50 characters.

---

**Note:**

- When the global value is initialized, you cannot change the name.
  - Global values cannot be named Java keywords such as String, Boolean, Integer, Public, and Finally.
- 

4. Optional: Enter a description of up to 255 characters.
5. Select the data type from the drop-down list.

[Data types](#)

6. Enter the default value.
- 

**Note:** When the value is initialized, you cannot change the type.

---

7. Specify whether users can overwrite the value:
  - **CANNOT be changed:** The default value remains constant across all users and bots.
  - **CAN be changed:** Users can overwrite the default value to use in their bots.
8. Click **Create global value**.

## Overwrite the default value

Global values can be configured to allow non-admin users to overwrite the default value. When building bots, use a global value for values that remain constant across all bots instead of creating a new variable for every bot.

As a non-admin user, you can only overwrite the default value in global values with a changeable scope. You can identify which global values have a changeable scope by checking the value in the **Scope changeable** column in the **All global values** table.

To verify if a global value has a changeable scope and to overwrite the default value, do the following steps:

1. Navigate to **BOTS > Global values**.  
The **All global values** table appears. Each row shows the data type, value name, whether the scope is changeable, and the last modified date and time.
2. Find the global value that has a changeable scope.
3. Move your mouse over the vertical ellipsis and click **Edit global value**.  
The **Edit global value** page appears with the **User value** field enabled.
4. Enter the value that will overwrite the default value.

---

**Note:** This value will overwrite the default value of this global value in all of your bots.

---

5. Click **Save changes**.

## Bot dependencies

Bots dependencies are files and other bots that are required to run that bot successfully.

### Related tasks

[Upload bot and its dependencies](#)

You can upload 11.x or 10.x bots, their dependent bots, and other files that are required to run a bot successfully in the Automation 360 Control Room.

[View bots dependencies](#)

You can view the files and bots that are added to a bot as its dependencies.

### Related reference

[Bot dependencies](#)

Bots dependencies are files and other bots that are required to run that bot successfully.

## Upload bot and its dependencies

You can upload 11.x or 10.x bots, their dependent bots, and other files that are required to run a bot successfully in the Automation 360 Control Room.

1. Click **BOTS > My bots**.
2. In the **PRIVATE** tab, expand the **Bots** folder and select the folder in which you want to upload the dependent files.
3. Click the **Upload files** icon.
4. On the **Upload files** page, click **Add files**.
5. From the **Open** dialog box, select the files you want to upload and click **Open**.
6. Click **Upload**.

### Related tasks

[Add bot dependencies](#)

You must add the files that are required to run a bot as its dependencies.

[View bots dependencies](#)

You can view the files and bots that are added to a bot as its dependencies.

## Add bot dependencies

You must add the files that are required to run a bot as its dependencies.

Ensure that the files you want to add as dependencies are uploaded in the Control Room, except for bots.

The system identifies the automatic dependencies for a bot and adds the required files and other bots as its dependencies. However, for manual dependencies, you must identify the files and bots that are required and add them as dependencies for a bot.

1. Click **BOTS > My bots**.
2. In the **PRIVATE** tab, expand the **Bots** folder that contains the bot for which you want to add dependencies.
3. Select the bot for which you want to add dependencies.
4. Select the **Edit Task Bot** icon from the actions menu (vertical ellipsis) on the right.
5. Select **Dependencies** from the actions menu (vertical ellipsis) on the top-right.
6. Expand the **Bots** folder and select the folder that contains the files you want to add as dependencies.
7. Select the files you want to add as dependencies from the Available files section and click the right arrow.
8. Click **Save**.
9. Click **Return to editor** if you want to update the bot or click **Close** to close the bot.

### Related tasks

[View bots dependencies](#)

You can view the files and bots that are added to a bot as its dependencies.

[Upload bot and its dependencies](#)

You can upload 11.x or 10.x bots, their dependent bots, and other files that are required to run a bot successfully in the Automation 360 Control Room.

## View bots dependencies

You can view the files and bots that are added to a bot as its dependencies.

1. In the **PRIVATE** or **PUBLIC** tab, expand the folder that contains the bot for which you want to view dependencies.
2. Select the bot for which you want to view dependencies.
3. Select the **View Task Bot** icon from the actions menu (vertical ellipsis) on the right.
4. Select **Dependencies** from the actions menu (vertical ellipsis) on the top-right.  
The system shows a list of files and bots that are added as dependencies for the bot.

### Related tasks

[Add bot dependencies](#)

You must add the files that are required to run a bot as its dependencies.

[Upload bot and its dependencies](#)

You can upload 11.x or 10.x bots, their dependent bots, and other files that are required to run a bot successfully in the Automation 360 Control Room.

## Get started building bots

Use the following three examples to become familiar with building bots using in the cloud-based Bot editor. These examples demonstrate using actions and the Universal Recorder to automate tasks in applications and browsers.

*[Build a Go be Great bot](#)*

Build a basic bot using a **Message Box** action and a variable. Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

*[Build a basic bot that uses a desktop application](#)*

Build a bot that uses a conditional statement to verify that the calculator is open, then uses the calculator to multiply two numbers. This example uses actions from the Application, If, Simulate keystrokes, Message Box, and Window packages.

*[Example of extracting data from a web table](#)*

Build a bot to open a browser window to the NASDAQ website, extract the data from a table, and write it to a CSV file on your desktop. This example uses actions from the Browser, Data Table, Recorder, and Window packages.

For more examples, see [Examples of building bots](#).

### More resources

- To learn more, search for the *Hello Automation 360 Bot: Getting Started with Building Bots* course in [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#).
- You can also visit the [Learn section of the developer portal](#) for more guidance. Find learning journeys and videos for both new and experienced developers on how to build your first bots.

## Build a Go be Great bot

Build a basic bot using a **Message Box** action and a variable. Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

To build a bot you must already have done the following:

- [Install Bot agent and register device](#)
- [Set user device credentials](#)

If you have already completed the steps in [Create your first bot](#), skip to Step 6.

### 1. Open a new bot:

- a) From the Control Room, select **Bots > My bots**.
- b) Click **Create new > Bot**.
- c) In the **Create Task Bot** window, enter a bot name.
- d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
- e) Click **Create and edit**.

### 2. Insert a **Message box** action.

- a) Click **Actions**.
- b) Search for the Message Box package.  
Click in the **Actions** search box and enter `message`. Click the arrow to expand the Message Box options.
- c) Double-click or drag the **Message box** action to the Bot editor (open space to the right).

### 3. In the dialog box on the right, specify the conditions for the **Message box** action.

- a) In the **Enter the message box window title** field, enter `My first bot!`.
- b) In the **Enter the message to display** field, enter `Go be great!`.
- c) Accept the defaults in the **Scrollbar after lines** field and **Close message box after** check box.

### 4. Click **Save**.

Your bot is now ready to run.

### 5. Test your bot.

Click **Run** at the top right.

The bot displays a Message box with the text `Go be great!`.

In the following steps, you configure a variable and insert it in the Message box.

### 6. Create a variable.

- a) Click **Variables** from the accordion menu on the left panel.
- b) Click **Create variable** (the + sign).
- c) Enter `vHelloWorld` in the name field.
- d) Select the **Use as output** option.
- e) Enter `Say Go be Great! with a variable` in the **Default value** field.
- f) Click **Create**.

7. Assign the `vHelloWorld` variable to the **Enter the message to display** field.
  - a) Click the **Message box** action in the Bot editor.
  - b) In the dialog box, delete the text from the **Enter the message to display** field.
  - c) Either press the F2 key or click the **Insert variable** icon.  
The **Insert variable** icon is located on the right-side of the text field.
  - d) Select `vHelloWorld` from the drop-down list.
  - e) Click **Yes, insert**.
8. Click **Save**.
9. Click **Run**.  
The bot displays a Message box with the text `Say Go be Great! with a variable`.

After you successfully run your bot, go to [Build a basic bot that uses a desktop application](#).

## Build a basic bot that uses a desktop application

Build a bot that uses a conditional statement to verify that the calculator is open, then uses the calculator to multiply two numbers. This example uses actions from the Application, If, Simulate keystrokes, Message Box, and Window packages.

To build a bot you must already have done the following:

- [Install Bot agent and register device](#)
- [Set user device credentials](#)

1. Open a new bot.
  - a) From Automation Anywhere web interface, select **BOTS > My bots**.
  - b) Click **Create new > Bot**.
  - c) Enter a bot name and click **Create and edit**.
2. Insert an conditional sequence that verifies that the calculator is open and activates the window.
  - a) Double-click or drag the **If** action.
  - b) Select **Window exists** from the **Condition** drop-down list.
  - c) Select **Calculator** from the **Window** drop-down list.  
The Calculator window is saved to the variable `window-1`.
  - d) Drag the **Message box** action into the **If** container.
  - e) In the **Enter the message to display** field, enter `The calculator is running`.
  - f) Drag the **Window > Activate** action into the **If** container below the **Message box** action.
  - g) In the **Window** field, insert the `window-1` variable.

3. Insert an alternative sequence that opens the calculator.
  - a) Double-click the **If > Else** action.
  - b) Drag the **Message box** action into the **Else** container.
  - c) In the **Enter the message to display** field, enter `The calculator is not running`.
  - d) Drag the **Application > Open program/file** action into the **If** container below the **Message box** action.
  - e) In the **Location of the program/file** field, enter `C:\Windows\System32\calc.exe`.
4. Insert the **Simulate keystrokes** action to perform the calculation.
  - a) Drag the **Simulate keystrokes** action below the **If** and **Else** containers.
  - b) In the **Window** field, insert the `window-1` variable.
  - c) In the **Keystrokes** field, enter `5*5=`.
  - d) In the **Delay** field, enter `500`.
5. Click **Save** to save the bot.
6. Run the bot.  
When the bot runs, the `The calculator is not running` message appears, then the Calculator window opens, and the calculation is performed.
7. Run the bot again.  
When the bot runs, the `The calculator is running` message appears, then the Calculator window activates, and the calculation is performed.

If the bot does not input all of the numbers into the calculator, try increasing the keystrokes delay.

## Example of extracting data from a web table

Build a bot to open a browser window to the NASDAQ website, extract the data from a table, and write it to a CSV file on your desktop. This example uses actions from the Browser, Data Table, Recorder, and Window packages.

To extract data from a table, do the following steps:

1. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.

2. Open a browser window to the web page from which you will extract the table.
  - a) Double-click or drag the **Browser > Open** action.
  - b) In the URL field, enter `https://old.nasdaq.com/`.
  - c) Select your preferred browser.
  - d) Click **Save**.
  - e) Click **Run**.  
The bot opens the window.
  
3. Specify the table.
  - a) Double-click or drag the **Recorder > Capture** action.
  - b) Click the **Window** tab and select the **Daily Stock Market Overview** window from the drop-down list.  
If the window title does not appear in the list, click **Refresh**.
  - c) Click **Capture object**.  
The **Daily Stock Market Overview** window activates.
  - d) Hover over the table below the Stock Market Overview heading.  
An orange box appears, surrounding the table.
  - e) Click the table.  
The **Object Processing** message box appears.
  - f) Return to the Control Room.
  - g) In the Object properties table, verify the Control Type is TABLE.  
If it is not, click **Recapture object**.
  - h) From the **Action** drop-down list, select **Get table**.
  - i) In the **Assign output to variable** field, create the `tNasdaqTable`.

The **Daily Stock Market Overview** window is saved as the variable `window-1`.

4. Specify the file where to save the data.
  - a) Double-click or drag the **Data Table > Write to file** action.
  - b) From the **Data table name** list, select `tNasdaqTable`.
  - c) Provide a file path to create a CSV file.  
For example, `C:\Users\\Desktop\NasdaqTable.csv`.
  - d) Select the **Create folders/files if it doesn't exist** option.
  - e) Select to overwrite the existing file.
  
5. Close the **Daily Stock Market Overview** window.
  - a) Double-click or drag the **Window > Close** action.
  - b) Select the **Variable** tab and insert `window-1`.
  
6. Click **Save**.
7. Click **Run**.  
The bot creates a CSV file on the desktop with data on seven indexes, their values, and net change.

## Examples of building bots

Use these example tasks to become familiar with the features and learn to build bots in Automation 360.

### Example of entering data into a web form from a worksheet

In this example, you build a bot to enter multiple rows of data from an XLSX sheet into a web form. Use actions from the Excel advanced, Loop, and Recorder packages.

To retrieve values from an Excel file and input them into a web form, do the following:

1. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.
  
2. Open the Excel file.
  - a) Double-click or drag the **Excel advanced > Open** action.
  - b) Enter a session name.
  - c) Select the Excel file.
  - d) Mark the **Sheet contains a header** option.

By marking the **Sheet contains a header** option, you enable the bot to search for the column by the header name during run time.

3. Launch the website.
  - a) Double-click or drag the **Browser > Launch website** action.
  - b) Enter the website URL.
  
4. Retrieve the worksheet values and store them in a Table variable.
  - a) Double-click or drag the **Excel advanced > Get multiple cells** action.
  - b) Enter the same session name you used in the **Excel advanced > Open** action.
  - c) Select **All rows** from the drop-down list.
  - d) Create a Table variable using the icon to the right of the **Assign to variable** drop-down list.

5. Instruct the bot to process the data row by row.
  - a) Double-click or drag the **Loop** action.
  - b) Select the **For each row in table** iterator.
  - c) Select the same Table variable that you used in **Get multiple cells**.
  - d) Create a Record variable using the icon to the right of the **Assign to variable** drop-down list.

The Record variable holds all of the values for one row. With each iteration of the Loop, the bot retrieves the values of the next row and stores them in the Record variable, overwriting the values from the previous row.

6. Map the first column header to the web form textbox.
  - a) Double-click or drag the **Recorder > Capture** action.
  - b) Select the same window you opened with the **Launch website** action.
  - c) Click **Capture object**.
  - d) Hover over the textbox until a red outline appears.
  - e) Click the textbox.
  - f) Return to the Control Room.
  - g) Verify that the **Control Type** value is TEXTBOX.
  - h) Select **Set text** from the **Action** drop-down list.
  - i) In the **Keystrokes** field, insert the same Record variable that you used in the Loop.
  - j) Select the **By name** option and copy-paste the first column header into the field.
7. Repeat the sub-steps in step 5 to map the other columns, with the following differences:
  - a) Instead of searching for the browser window title, insert the Window variable generated by the Recorder.
  - b) When inserting the Record variable in the **Keystrokes** field, copy-paste the subsequent column header into the "By name" field.
8. Capture the Submit button.
  - a) Double-click or drag the **Recorder > Capture** action.
  - b) Insert the Window variable generated by the Recorder.
  - c) Click **Capture object**.
  - d) Verify that the **Control Type** value is BUTTON.
  - e) Select the **Click** action.

9. Click **Save**.

### Related reference

#### [Excel advanced package](#)

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

#### [Recorder package](#)

Use the **Capture** action from the Recorder package to capture an interaction with a user interface (UI) object such as a text box, button, table, menu, radio button, combo box, check box, list view, link, tree, and page tab.

## Example of passing a value between bots

Learn how to pass a value from one TaskBot to another by using a dictionary variable.

To pass values between TaskBots, use any variable type in the child bot and a dictionary variable in the parent bot. This example uses a string called *sMySong* in the child bot.

Build the child bot.

1. Open a new bot:
  - a) From the Control Room interface, select **Bots > My bots**.
  - b) Click **Create New > Bot**.
  - c) Enter the bot name: `FavoriteSongs`
  - d) Enter the folder location: `Bots\TaskBotExample`
  - e) Click **Create and Edit**.
2. Create a variable: `sMySong`: string type; use as input, use as output.  
*Create a variable*
3. Use a **Prompt > For value** action to capture a song name.
  - a) Double-click or drag the **Prompt > for value** action.
  - b) In the **Prompt window caption** field, enter `Add a song`.
  - c) In the **Prompt message** field, enter `Type in a favorite song`.
  - d) In the **Assign the value to a variable** field, enter `sMySong`.

---

**Note:** In the List display mode, your child bot should be one line of code:

```
Prompt: For value
```

---

4. Click **Save** and then click **Close**.

Build the parent bot.

5. Open a new bot:
  - a) From the Control Room interface, select **Bots > My bots**.
  - b) Click **Create New > Bot**.
  - c) Enter the bot name: `GetFavoriteSongs`
  - d) Enter the folder location: `Bots\TaskBotExample`.
  - e) Click **Create and Edit**.
6. Create the following variables:
  - `sMySong`: string type; use as input
  - `sPassedSong`: dictionary type/string subtype; use as input, use as output

7. Use a **Task Bot > Run** action to call the child bot:
  - a) Double-click or drag the **Task Bot > Run** action.
  - b) In the **Task Bot to run** field, select **Control Room** and click **Choose**.
  - c) Click **Browse**, navigate to `Bots\TaskBotExample`, and select **FavoriteSongs**.
  - d) In **Input values**, select **Set sMySong**.
  - e) In **Save the outcome to a variable (optional)**, select **Dictionary**, and then select **sPassedSong**.
  - f) Click **Save**.
  
8. Use the **Dictionary > Get** action to accept the value returned from the child bot.
  - a) Double-click or drag the **Dictionary > Get** action.
  - b) In the **Dictionary Variable** field, select **sPassedSong**.
  - c) In the **Key** field, select **sMySong**.
  - d) In the **Assign the output to variable** field, select **sMySong**.
  - e) Click **Save**.
  
9. Use a **Message box** action to report what was returned from the child bot:
  - a) Double-click or drag the **Message box** action.
  - b) In the **Enter the message box window title** field, enter `What do you like?`.
  - c) In the **Enter the message to display** field, enter `You said, $sMySong$`.
  - d) Click **Save**.

---

**Note:** In List display mode, your parent bot should look like this:

```
Start
Task Bot: Run and assign output to variable
Dictionary: Get value of the key "sMySong" from sPassedSongS
Message box "You said, $sMySong$"
End
```

---

## 10. Run your bot.

When prompted to **Set input variables**, click **Confirm**. Follow the prompts and a message box should return the same value you entered for your song. If no value are returned, ensure you have performed the steps to assign the incoming value to a dictionary key and a variable.

### Related reference

[Dictionary package](#)

The **Dictionary** package contains actions that enable you to do various operations on dictionary-type values.

## Example of using a conditional statement

In this example, you build a bot that prints a message based on whether a cell has a value or is empty. Use the actions from the Excel basic or Excel advanced, If, and Message Box packages.

Before building this bot, save an empty Excel worksheet to the desktop.

Because this bot does not create a new Excel worksheet, you can use either the Excel basic or Excel advanced packages.

---

**Note:** All of the actions must be from the same package.

---

1. Open a new bot.
  - a) From Automation Anywhere web interface, select **BOTS > My bots**.
  - b) Click **Create new > Bot**.
  - c) Enter a bot name and click **Create and edit**.
  
2. Use the **Open** action from the Excel basic or the Excel advanced package to open the Excel sheet.
  - a) Double-click or drag the **Open** action.
  - b) Enter a session name.
  - c) Click **Browse** to provide the file path to the empty Excel worksheet on the desktop.
  
3. Use the **Get single cell** action to assign the value of a cell to a string variable.
  - a) Double-click or drag the **Get single cell** action from the same package that you used for the **Open** action.
  - b) Provide the session name that you used in the **Open** action.
  - c) Select the **Active cell** option.
  - d) In the **Store cell contents to** field, create the variable `Output`.
  
4. Use the **If** action to configure the conditional statement.
  - a) Double-click or drag the **If** action.
  - b) Select **String** from the **Condition** drop-down list.
  - c) In the **Source value** field, insert the variable `Output`.
  - d) Select **Equals to** as the **Operator**.
  - e) Leave the **Target value** field empty.
  
5. Insert a Message box into the **If** container.
  - a) Drag the **Message box** action.
  - b) In the **Enter the message to display** field, enter `Cell is empty`.
  
6. Use the **Else** and **Message box** actions to configure the alternative sequence of actions.
  - a) Drag the **Else** action next to the **If** action.
  - b) Drag the **Message box** action into the **Else** container.
  - c) In the **Enter the message to display** field, enter `Cell is not empty`.
  
7. Click **Save**.
8. Run the bot.

As the bot runs, the message box appears with the message `Cell is empty`.
9. Enter a value into the cell located at A1 in the Excel sheet and save the sheet.
10. Run the bot.

As the bot runs, the message box appears with the message `Cell is not empty`.

**Related reference**[Excel advanced package](#)

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

[If package](#)

Use the actions in the **If** package to control the sequence of execution based on one or more conditions of a task.

[Message box package](#)

Use the **Message box** action from the **Message box** package to insert a message box that shows a message when the task runs. For example, you can insert a **Message Box** action to follow a web form so that the action displays the message: `Web Form Filled and Complete.`

## Example of using Python script to join a list

Build a bot that uses a Python function to print the message `Go Be Great!`, the Automation Anywhere version of `Hello World`. In this example, the bot combines a list of string values and prints them to a message box.

To run Python script from Automation 360, you must already have the latest version of Python 3.x installed on your device.

1. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location `\Bots\`.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.
2. Create a variable to hold the list values:
  - a) Click the **Create variable** icon.
  - b) Enter `lArgument` in the **Name** field.

---

**Recommendation:** Prefix the variable name with a lowercase character to indicate the variable data type.

[Variable naming](#)

---

- c) Select the **List** type and **String** subtype.
- d) In the **Default value** field, enter the following values:
  1. **Value at 0:** `Go`
  2. **Value at 1:** `Be`
  3. **Value at 2:** `Great`
  4. **Value at 3:** `!`
- e) Click **Create**.

3. Provide the script with a **Python Script > Open** action:
  - a) Double-click or drag the **Python Script > Open**.
  - b) Select the **Manual input** option.
  - c) Copy and paste the following text into the **Enter script here** field.

```
def data ( str ) :
    x = " ".join( str )
    return x
```

4. Use a **Python Script > Execute function** action to tell the bot to run the script:
  - a) Double-click or drag **Python Script > Execute function**.
  - b) Enter `data` in the **Enter name of function to be executed** field.
  - c) Select the **Argument** variable from the **Arguments to the function** drop-down list.
  - d) Create the variable `sOutput` for the **Assign the output to variable** field.
5. Insert a **Message box** action to hold the Python function output:
  - a) Double-click or drag the **Message box > Message box** action.
  - b) In the **Enter the message to display** field, select and insert the variable **sOutput**.
  - c) Select the **Close message box after** option. Retain the default value of 5 seconds in the field.
6. Close the script execution session with a **Python Script > Close** action:
  - a) Double-click or drag **Python Script > Close**.
  - b) Click **Save**.
7. Click the **Run** icon.  
The bot generates a message box with the text `Go Be Great!`. After 5 seconds, the message box disappears.

To review the bot launcher logs, navigate to `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\<current month>\Bot_Launcher-<today's date>.log.zip`. Each zipped folder contains a file with data on the code execution, which is useful for debugging.

### Related reference

[Python Script package](#)

The **Python Script** package contains actions that enable Python Script functions in a task.

[Message box package](#)

Use the **Message box** action from the **Message box** package to insert a message box that shows a message when the task runs. For example, you can insert a **Message Box** action to follow a web form so that the action displays the message: `Web Form Filled and Complete`.

## Example of transferring data from CSV file to Excel worksheet

In this example, you build a bot to update the product inventory in an Excel worksheet with new product names from a CSV file. Use actions from the CSV/TXT, Excel advanced, IF/ELSE, and Loop packages.

Before you start building the bot, create the following data sets on your desktop in the specified file formats:

### Data set 1: ProductInventory.xlsx

Item number	Name	Count	Category	Unit price	Taxable
A0001	Milk	15	Grocery	3	N
A0002	Eggs	6	Grocery	4	N
A0003	Flower	3	Garden	10	Y
A0004	Table	1	Home	50	Y
A0005	Towel	4	Home	10	Y
A0006	Dog Food	16	Pet	22	N
A0007	Paint	43	Home	12	Y

### Data set 2: NewProductNames.csv

Item number	Name
A0005	Hand Towel
A0002	Chicken Eggs
A0003	Sunflower
A0004	Coffee Table
A0006	Dog Food - Small Dogs
A0007	Paint - Dark Blue
A0001	2% Milk

1. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.
  
2. Open the `NewProductNames.csv` file that you just created.
  - a) Double-click or drag the **CSV/TXT > Open** action.
  - b) In the **Session name** field, enter `session 1`.
  - c) Provide the file path to `NewProductNames.csv`.
  - d) Select the **Contains header** option.

3. Open the `ProductInventory.xlsx` file that you just created.
  - a) Double-click or drag the **Excel advanced > Open** action.
  - b) In the **Session name** field, enter `session 1`.
  - c) Provide the file path to `ProductInventory.xlsx`.
  - d) Choose to open the file in **Read-write** mode.
  - e) Select the **Contains header** option.
4. Use the **Go to cell** action to indicate the first cell in which to update the product names.
  - a) Double-click or drag the **Excel advanced > Go to cell** action.
  - b) In the **Session name** field, enter `session 1`.
  - c) Select the **Specific cell** option and enter `B2`.
5. Use a **Loop** action to retrieve the cell values in each row from `ProductInventory.xlsx`.
  - a) Double-click or drag the **Loop** action.
  - b) Select the **Excel Advanced > For each row in worksheet** iterator.
  - c) In the **Session name** field, enter `session 1`.
  - d) In the **Loop through** field, select **All rows**.
  - e) In the **Assign current value to this variable** field, create a `rInventory` variable.
6. Use a **Loop** action to retrieve the cell values in each row from `NewProductNames.csv`.
  - a) Drag the **Loop** action into the **For each row in worksheet Loop** container.
  - b) Select the **For each row in CSV/TXT** iterator.
  - c) In the **Session name** field, enter `session 1`.
  - d) In the **Assign current value to this variable** field, create a `rNewProduct` variable.
7. Use an **If** action to compare the item number from `ProductInventory.xlsx` to the item number from `NewProductNames.csv` to ensure they are the same before moving on to the next action.
  - a) Double-click or drag the **If** action into the **For each row in csv/txt Loop** container.
  - b) Select the **String** condition.
  - c) In the **Source value** field, input `rInventory[0]`.
  - d) Select the **Equals to (=)** operator.
  - e) In the **Target value** field, input `rNewProduct[0]`.
8. Use the **Set cell** and **Go to cell** actions to update the product name and move to the cell below.
  - a) Double-click or drag the **Excel Advanced > Set cell** action.
  - b) In the **Session name** field, enter `session 1`.
  - c) Select the **Active cell** option.
  - d) In the **Cell value** field, input `rNewProduct{Name}`
  - e) Double-click or drag the **Excel Advanced > Go to cell** action.
  - f) In the **Session name** field, enter `session 1`.
  - g) From the **Active cell** drop-down list, select **One cell below**.

9. Insert an alternative to the **If** action: if the item numbers are not the same, the bot continues to the next row in `NewProductNames.csv`.
- Drag the **If > Else** action.
  - Drag the **Loop > Continue** action.

10. Close the files.

- Double-click or drag the **Excel advanced > Close** action.
- In the **Session name** field, enter `session 1`.
- Select the **Save changes** option.
- Double-click or drag the **CSV/TXT > Close** action.
- In the **Session name** field, enter `session 1`.

11. Click **Save**.

12. Run the bot.

The bot updates the `ProductInventory.xlsx` file to look like the following table:

**Data set 3: ProductInventory.xlsx**

Item number	Name	Count	Category	Unit price	Taxable
A0001	2% Milk	15	Grocery	3	N
A0002	Chicken Eggs	6	Grocery	4	N
A0003	Sunflower	3	Garden	10	Y
A0004	Coffee Table	1	Home	50	Y
A0005	Hand Towel	4	Home	10	Y
A0006	Dog Food - Small Dogs	16	Pet	22	N
A0007	Paint - Dark Blue	43	Home	12	Y

**Related reference**

[CSV/TXT package](#)

The **CSV/TXT** package contains actions that enable you to open a CSV or text file, read data from that file, and assign the data to a Table variable. This package supports files encoded in ANSI, Unicode, UTF-8, or Windows-1251, and can process up to one million records.

[Excel advanced package](#)

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

[If package](#)

Use the actions in the **If** package to control the sequence of execution based on one or more conditions of a task.

[Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

## Run TaskBot to merge Excel sheets

Download and run sample TaskBot from the Bot Store to merge two spreadsheets.

Complete these requirements for using the example *TaskBot*:

- Microsoft Excel must reside on the Bot Runner device
- Automation 360 Build 4088 or later
- Excel Advanced package version 2.0.0-20200422-000103 or later
- Two spreadsheets as input: Both sheets must have common data within column A, such as a product or customer number

You can manually create the spreadsheets with columns similar to the following tables 1 and 2. Sheet 1 has columns to append to sheet 2 where a common value resides in column A. The bot expects the file locations and names to be `c:\bot_test\Spreadsheet1.xlsx` and `c:\bot_test\Spreadsheet2.xlsx`.

**Table 1**

Item Number	Name	Count	Category	Unit Price	Taxable	Backorder	Perishable	Locale
A0001	Milk	15	Grocery	3	N	Y	Y	US
A0005	Towel	4	Home	10	Y	N	N	US
A0006	Dog Food	16	Pet	22	N	N	N	US
A0007	Paint	43	Home	12	Y	N	N	IN

**Table 2**

Item Number	Name	Brand	Popular	Unit Price	TTS
A0001	Milk	Wholesome Foods	Y	3	1
A0002	Eggs	Dairy Love	Y	4	1
A0003	Flower	Spring Me Up!	N	10	3
A0004	Table	Woods Are Us	N	50	10
A0005	Towel	Claire Dane	N	10	6
A0006	Dog Food	Purina	Y	22	3
A0007	Paint	Color the World	N	12	2

1. Get the *Merge Excel Sheets Example* bot from the Bot Store.  
The bot is automatically loaded to your Automation 360 On-Premises or Cloud environment.  
You will receive an email with instructions for installing the bot in Automation 360 from the Bot Store.
2. Follow the instructions carefully. If you do not have the Bot Developer role assigned, contact your administrator to add the role.

3. If your spreadsheets are not located at `c:\bot_test\Spreadsheet1.xlsx` and `c:\bot_test\Spreadsheet2.xlsx`, update lines 5 and 9 of the bot with your desktop file location.
4. Run the TaskBot.
5. Update the TaskBot with any changes that reflect your use case, and make it your own.  
You can also use the bot as a template for future Excel Advanced TaskBots by copying and saving it with a new name.

### Related reference

#### [Excel advanced package](#)

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

## Example of migrating data from Excel to a database

In this example, you build a bot to transfer values from an Excel spreadsheet to a database using actions from the Database, Excel advanced, and Loop packages.

Before you start building your bot, create the following:

- Excel spreadsheet with the following values:

John	Williams	jwilliams@gmail.com
Sam	Li	sam.li@xyz.org
Carl	Miller	carl@carlmillerllc.com

- Access database table named CustomerT with the following columns:
  - FirstName
  - LastName
  - Email

To migrate values from a spreadsheet to a table in a database, perform the following steps:

1. Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.
2. Open the spreadsheet:
  - a) Double-click or drag the **Excel advanced > Open** action .
  - b) Click **Browse** to provide the file path.
  - c) Select the option to open the file in **Read-write**.

3. Connect to the database:
  - a) Double-click or drag the **Database > Connect** action.
  - b) Select the **User defined** connection mode.
  - c) Select the **Microsoft Access** database type.
  - d) Click **Browse** to provide the file path.
4. Insert the Excel values into the database, row by row:
  - a) Double-click or drag the **Loop** action.
  - b) Select the **Excel advanced > For each row in worksheet** iterator.
  - c) In the Assign the current value to this variable, create the record variable `rExcelCurrentRow`.
  - d) Drag the **Database > Insert/Update/Delete** action into the Loop container.
  - e) Enter the following SQL statement:
 

```
INSERT INTO CustomerT (FirstName,LastName,Email) values
('{$rExcelCurrentRow[0]}','{$rExcelCurrentRow[1]}','{$rExcelCurrentRow[2]}');
```
5. Disconnect from the database. Drag the **Database > Disconnect** action below the Loop container.
6. Close the spreadsheet. Double-click or drag **Excel advanced > Close Spreadsheet** action.
7. Click **Save**.

### Related reference

#### [Database package](#)

Databases support internal operations of an enterprise by storing a variety of data, such as sales transactions, product catalogs, inventories, and customer profiles. Use the Database package to connect to a database, begin a transaction, and manipulate the stored data by retrieving, inserting, updating, deleting, and exporting it to a CSV file.

#### [Excel advanced package](#)

The Excel advanced package contains actions that enable you to automate many of the repetitive tasks when working with Microsoft Excel spreadsheets.

#### [Loop package](#)

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

## Example of using the Run action

The **Run** action from the TaskBot package enables you to run and pass values to one or more child bots. In this example, you use the **Run** action to pass two values from a parent bot to the child bot; the child bot adds the values and passes the sum back to the parent bot.

This example demonstrates the following:

### Modularization

Modularization separates a TaskBot into several bots, where each bot is built with all the actions necessary to perform one specific function of the greater task.

In this example, you build a single child bot to add the values. You can build several child bots, with each performing a different mathematical operation,

and edit the parent bot to call whichever one you want to use.

## Reusability

Reusability enables the user to build a bot once, and then use that bot to automate many processes.

The child bot contains only the actions necessary to add the values and print them to a Message Box. Also, the bot adds two variables instead of hard-coded values. As a result, this bot can be reused for any task that involves an addition operation.

## Data control

Because the child bot accepts and returns values only through the use of variables, it does not hold data. This minimizes the chance of data leakage.

To run a TaskBot from the current task, perform these steps:

Build the child bot.

### 1. Open a new bot.

- a) From Automation Anywhere web interface, select **Bots > My bots**.
- b) Click **Create a bot**.
- c) Enter the bot name `AddChildBot`.
- d) Enter the folder location `Bots\TaskBotExample`.  
To change where your bot is stored, click **Choose** and follow the prompts.
- e) Click **Create and Edit**.

### 2. Create the following variables:

- `v1`: number type; use as input
- `v2`: number type; use as input
- `nSum`: number type
- `sSum`: string type; use as output

#### *Create a variable*

### 3. Use a **Number > Assign** action to perform the mathematical operation.

- a) Double-click or drag the **Number > Assign** action.
- b) In the **Select the source string variable/ value** field, enter the following expression: `$(v1) + $(v2)`
- c) Select `nSum` from the **Select destination number variable** list.

### 4. Use the **Number > To string** action to convert the value so it can be printed to a Message Box.

- a) Double-click or drag the **Number > To string** action.
- b) In the **Enter a number** field, enter the following expression: `$(nSum)`
- c) Select `sSum` from the **Assign output to variable** list.

### 5. Click **Save**.

### 6. Click **Close**.

Build the parent bot.

7. Open a new bot.
  - a) From the web interface, select **Bots > My bots**.
  - b) Click **Create a bot**.
  - c) Enter the bot name `MathBot`.
  - d) Enter the folder location `\Bots\TaskBotExample`.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and Edit**.
8. Create a Dictionary variable of Any subtype named `dSums` to accept the values passed from the child bot.  
Use the Any subtype to enable the parent bot to accept String, Number, or Boolean type values.
9. Insert a **Task Bot > Run** action to specify the values for the mathematical operation and the output variable to hold the sum.
  - a) Double-click or drag the **Task Bot > Run** action.
  - b) Click **Browse** to navigate to `Bots\TaskBotExample\AddChildBot`.
  - c) Enter the following values in the **Input values** fields:
    - `v1: 12`
    - `v2: 54`
  - d) Select `dSums` from the **Assign output to variable** list.

---

**Note:** Use a Dictionary variable to hold the output of the **Run** action in order to make the parent bot more versatile. This way a parent bot can handle different child bots regardless of whether they return a single value or several values.

---

10. Use a Message Box to retrieve and print the sum.  
The variable `sSum` retrieved from the child bot is a key in the Dictionary variable `dSums`.

---

**Note:** You must know the variable names from the child bot to extract them from the parent bot. The interface does not automatically import the variable names to the parent bot.

---

- a) Double-click or drag the **Message box** action.
  - b) Enter `$dSums{sSum}$` in the **Message to display** field.
11. Click **Save**.
  12. Click **Run**.  
The bot runs and the Message Box appears containing the sum 66.

### Related reference

[Task Bot package](#)

Use the **Run**, **Pause**, and **Stop** actions in the Task Bot package to manage running one or more child bots from a parent bot or with a third-party software using an API.

[Message box package](#)

Use the **Message box** action from the **Message box** package to insert a message box that shows a message when the task runs. For example, you can insert a **Message Box** action to follow a web form so that the action displays the message: `Web Form Filled and Complete`.

## Example of using the SOAP web service action

Use the **SOAP web service** action to pass two numeric values and return the sum from an online calculator application.

To make a SOAP web services call, perform these steps:

1. Double-click or drag the **SOAP web services** action.
2. Select a connection method:
  - To connect using a URI, enter the URI. For example, `http://www.dneonline.com/calculator.asmx?WSDL`.
  - To connect using a file, select a file from the Control Room or the Desktop, or insert a variable.
3. Optional: Enter the SOAP endpoint in the **Address location** field.
4. In the **Service** field, enter the service name.  
This field identifies the collection of ports supported by the web service. It holds the `@service name` value for a SOAP web service call.  
For example, `Calculator`
5. In the **Port** field, enter the endpoint to connect with.  
This field holds the `@binding name` value for a SOAP web service call.  
For example, `CalculatorSoap`
6. Select the **SOAP version** of the endpoint that you specified in the **Port** field.  
Choose from **1.1** or **1.2**.
7. In the **Operation** field, enter the name of the service function for the endpoint that you specified in the **Port** field.  
This field holds the `@operation name` value for a SOAP web service call.  
For example, `Add`
8. Select either the **Operation parameters** or **Raw data parameters** option to provide the parameter details.
  - If you select **Operation parameters**, enter the name and value of each parameter. For example, enter these values:
    - a. `intA` in the first **Name** field.
    - b. `10` in the first **Value** field.
    - c. `intB` in the second **Name** field.
    - d. `20` in the second **Value** field.
  - If you select **Raw data parameters**, enter the XML value.
9. Select either the **No Authentication** or **Basic** option from the **Authentication Mode** list.
  - If you select **No Authentication**, proceed to the next step.
  - If you select **Basic**, enter your credentials.
10. Optional: Provide a Client certificate by selecting a file from the Control Room or your desktop, or insert a variable.
11. Optional: Provide custom headers.

- 12.** Optional: Provide a file to save the XML output.
- 13.** Select either the **Complete response** or **Selected response** option to narrow the response scope.

- If you select **Complete response**, proceed to the next step.
- If you select **Selected response**, perform the following steps:

- a.** Provide the XPath expression. For example:

```
/*[local-name()='Envelope' and namespace-uri()='http://schemas.xmlsoap.org/soap/envelope/']/*[local-name()='Body' and namespace-uri()='http://schemas.xmlsoap.org/soap/envelope/']/*[local-name()='AddResponse' and namespace-uri()='http://tempuri.org/']/*[local-name()='AddResult' and namespace-uri()='http://tempuri.org/']
```

- b.** Select a section of the XML output: **Values**, **Inner XML**, or **Outer XML**.
- c.** If you select **Values**, choose a delimiter option: **Pipe** or **Semicolon**.

- 14.** Select a variable to store the XML output.

For example, *prompt-assignment*

- 15.** Verify the output of the **SOAP web service** action by inserting a **Message box** action with the variable *prompt-assignment* in the body message.

When you run the bot, the Message box should show 30.

### Related reference

#### [SOAP Web Service package](#)

Use the **SOAP web service** action from the SOAP Web Service package to access and exchange information between two systems in XML format.

## Build a Bot Insight dashboard bot

In this example, you build a bot that retrieves data from a website to create visualizations in Bot Insight.

Configure an empty string variable named `sNull`.

### [Create a variable](#)

- 1.** Open a new bot:
  - a) From the Control Room, select **Bots > My bots**.
  - b) Click **Create new > Bot**.
  - c) In the **Create Task Bot** window, enter a bot name.
  - d) Accept the default folder location **\Bots\**.  
To change where your bot is stored, click **Choose** and follow the prompts.
  - e) Click **Create and edit**.

2. Open a browser window to the web page from which you want to extract the table.
  - a) Double-click or drag the **Browser > Launch website** action.
  - b) In the URL field, enter `https://www.statista.com/statistics/183483/ranking-of-languages-spoken-at-home-in-the-us-in-2008/`.
  - c) Select the Internet Explorer browser.

---

**Recommended:** Use Microsoft Internet Explorer because it reliably launches the website in a new window, even if another window is already open. Other browsers might launch the website in a new tab if there is an open window.

---

- d) Click **Save**.
  - e) Click **Run**.  
The bot opens the window.
3. Select the table for extraction.
  - a) Double-click or drag the **Recorder > Capture** action.
  - b) Click the **Window** tab and select the **Languages spoken in the United States 2018 | Statista** window from the drop-down list.  
If the window title does not appear in the list, click **Refresh**.
  - c) Click **Capture object**.  
The **Languages spoken in the United States 2018 | Statista** window is activated.
  - d) Hover over the table until an orange box that surrounds the entire table appears.
  - e) Click the table.
  - f) Return to the Control Room.
  - g) In the Object properties table, verify the Control Type is TABLE.  
If it is not, click **Recapture object**.
  - h) From the **Action** drop-down list, select **Get table**.
  - i) In the **Assign output to variable** field, create the `tLanguages` table variable.
4. Specify the file in which to save the data.
  - a) Double-click or drag the **Data Table > Write to file** action.
  - b) From the **Data table name** list, select **tLanguages**.
  - c) Provide a file path to create a CSV file.  
For example, `C:\Users\\Desktop\LanguagesTable.csv`.
  - d) Select the **Create folders/files if it doesn't exist** option.
  - e) Select to overwrite the existing file.
5. Specify the file that holds the extracted data.
  - a) Double-click or drag the **CSV/TXT > Open** action.
  - b) Provide the file path to the file specified in step 4.
  - c) Select the **Contains header** option to exclude the first row.

6. Iterate though each row of the file.
  - a) Double-click or drag the **Loop** action.
  - b) Select the **For each row in CSV/TXT** iterator.
  - c) In the **Assign the current row to this variable** field, create the variable `rCurrentRow`.
  
7. Specify the data to populate the Bot Insight dashboard.
  - a) Double-click or drag the **Analyze > Open** action.
  - b) Double-click or drag the **String > Assign** action.
  - c) Enter `$rCurrentRow[0]$` as the source string.  
Press F2 to open the variables menu.
  - d) In the **Select destination string variable** field, create the variable `sLanguage`.
  - e) Double-click or drag the **String > Replace** action.  
The extracted data uses commas to separate digits. You must remove the commas before you can convert the string to a number data type to use in Bot Insight.
  - f) Enter `$rCurrentRow[1]$` as the source string.  
Press F2 to open the variables menu.
  - g) Enter `,` in the **Find string** field.
  - h) Select the **Not a regular expression** option.
  - i) In the **Replace with** field, enter `$sNull$`.
  - j) In the **Assign the output row to variable** field, create the variable `sPopulation`.
  - k) Double-click or drag the **String > To number** action.
  - l) Enter the `$sPopulation$` variable.
  - m) In the **Assign the output row to variable** field, create the variable `nPopulation`.
  - n) Double-click or drag the **Analyze > Close** action.
  - o) Select the following variables:
    - **sLanguage**
    - **nPopulation**
  
8. Click **Save** and then **Run**.
9. Click **Analyze**.  
The Bot Insight window appears.

Learn more about dashboards.

[Bot Insight dashboards](#)

### Related reference

[Analyze package](#)

Use the actions in the **Analyze** package to specify the actions and variables to use in the Bot Insight dashboard and widgets. The **Analyze** package enables you to perform transactional analytics for the data that is logged by the variables when the bot runs.

[Browser package](#)

The **Browser** package contains actions that enable you to download files, find broken links, and launch a website. This package supports Internet Explorer, Microsoft Edge and Google Chrome browsers.

[Recorder package](#)

Use the **Capture** action from the Recorder package to capture an interaction with a user interface (UI) object such as a text box, button, table, menu, radio button, combo box, check box, list view, link, tree, and page tab.

#### Data Table package

The Data Table package contains actions that enable you to perform various operations on the values of table variables. Use these actions to join or merge content, search for specific values, insert rows and columns, remove duplicate rows, and write values to a file.

#### CSV/TXT package

The **CSV/TXT** package contains actions that enable you to open a CSV or text file, read data from that file, and assign the data to a Table variable. This package supports files encoded in ANSI, Unicode, UTF-8, or Windows-1251, and can process up to one million records.

#### Loop package

Use the Loop package to run a sequence of actions repeatedly for a specific number of times or until a specific condition is met.

## Using AARI on the web interface

AARI on the web interface guides you through complex workflows in front- and back-office functions. It automatically involves the relevant parties for their observation and response without you ever having to leave the web browser.

AARI on the web interface provides an engaging experience with attended and unattended bots. It gives you a one-stop place to view and organize your documents and tasks, perform actions, and hand over the work to bots. In addition, it provides a process-centric approach to deliver automation.

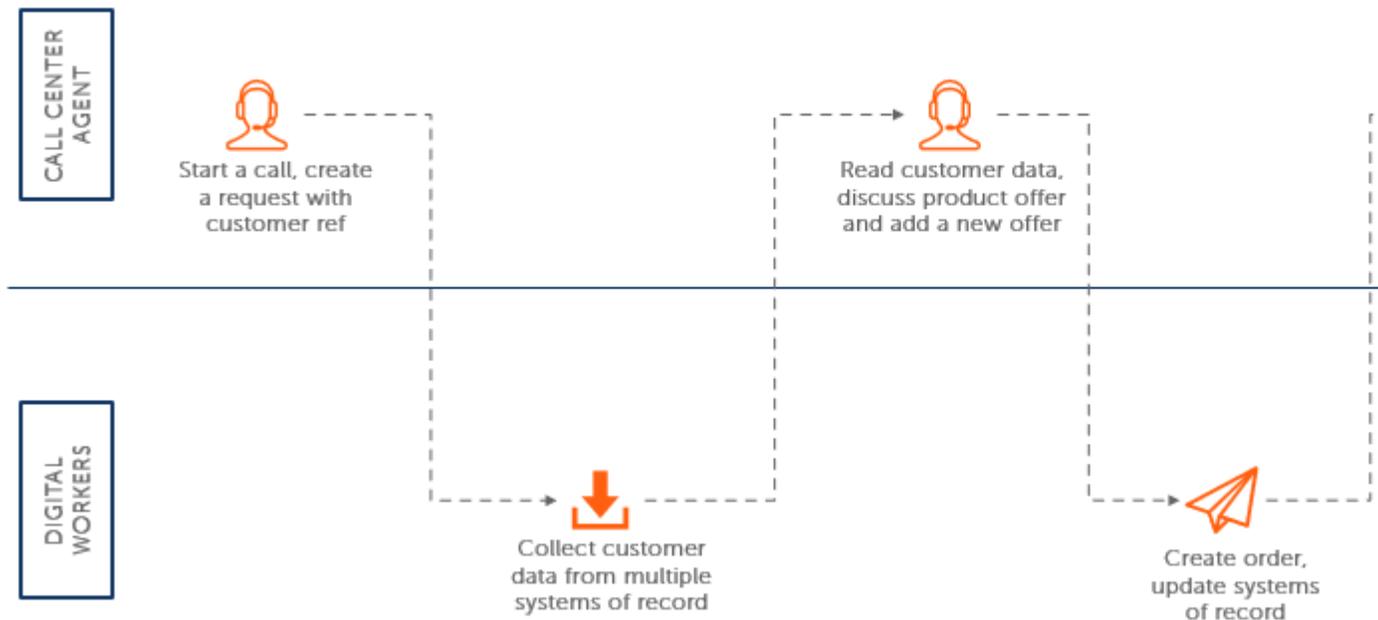
### AARI web interface capabilities

AARI on the web interface helps you in the following ways:

- Start automation from an easy to use process catalog.
- Automate long-running workflows across multiple users and bots.
- Handle bot exceptions.
- Train users and reduce errors with guided automation.
- Multitask with humans and bots.
- Monitor and audit attended automation.

It also helps multiple users working in a team collaborate with bots without disruption and helps in protecting the PII data and confidential systems.

The following illustration explains front-office automation:



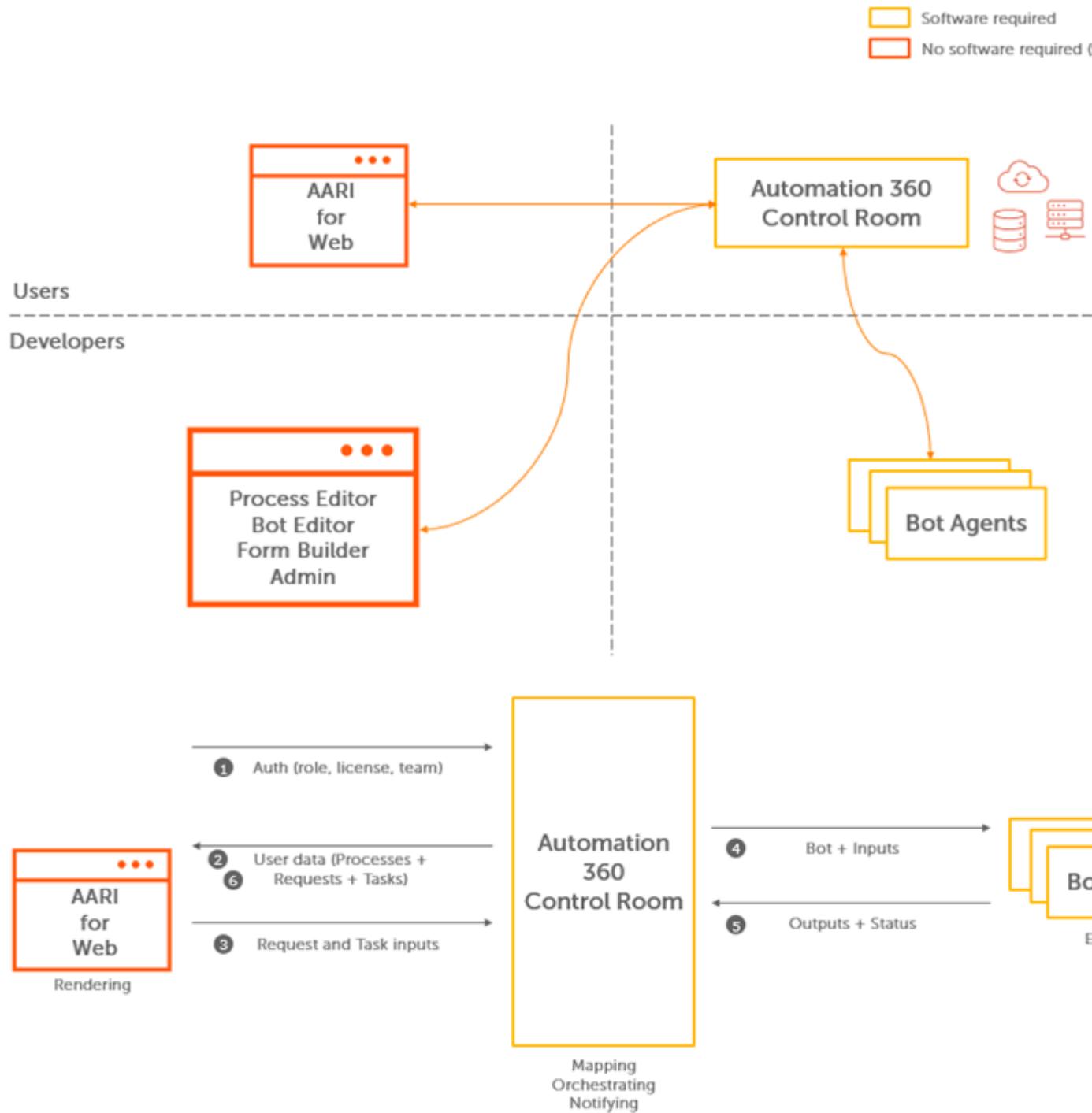
## AARI web interface components

The components that constitute AARI in the web interface are as follows:

- **Bots:** The bots automate specific, repetitive, rule-based tasks.
- **Form:** The form enables humans to invoke and interact with the bots through the customizable web interface.
- **Process:** The process connects the bots and the forms together. The process contains the logic for triggering the bots and the forms and coordinating the flow of data between them.
- **Request:** The request is an instance of a process. If the process defines a template of how bots and forms interact, a request is a specific instance of that template.
- **Task:** Tasks are the steps that need to be performed within a process. Processes can have two types of tasks:
  - **Human task:** A task that is performed by a human; a human task is a form.
  - **Bot task:** A task that is performed by a bot.

## AARI web interface architecture

The following images illustrate the architecture of AARI in the web interface.



## Setting up AARI on the web interface

The following workflow describes how to use AARI on the web interface to automate and manage your tasks:

- *Configure and set up roles*
- *Configure processes*

- *Deploy processes*

## AARI web interface users

Various users are involved in AARI on the web interface and each user contributes in different ways to help the automate the business requirements.

AARI users are broadly categorized into two types, users who can access the Control Room and users who have access only to the web interface. Each user's role and responsibility vary depending on the stage of the workflow.

### Users and their roles

The following table illustrates the relationship between users, roles, and the permissions they have while using AARI on the web interface.

User	Role	Permissions
Control Room administrator	<b>AAE_Admin</b>	Create users with AARI license and assign roles.
Bot Creator	<b>AAE_Basic</b>	<ul style="list-style-type: none"> <li>• Create a process.</li> <li>• Check in a process.</li> <li>• Check out a process.</li> <li>• Run a private process.</li> <li>• Delete a process.</li> <li>• Import a process.</li> <li>• Export a process.</li> </ul>
AARI admin	<b>AAE_Robotic Interface Admin</b>	<ul style="list-style-type: none"> <li>• Configure scheduler user and allocate Control Room resources (device pool and unattended bot runners) to a process in the configuration setup stage.</li> <li>• Perform the following global team and process management tasks in the process deployment stage: <ul style="list-style-type: none"> <li>• Create, view, and modify all teams.</li> <li>• Assign AARI to a team.</li> <li>• Assign teams to processes.</li> </ul> </li> </ul>

User	Role	Permissions
AARI manager	<b>AAE_Robotic Interface Manager</b>	<ul style="list-style-type: none"> <li>• Create and view teams.</li> <li>• Add members to or remove members from the teams.</li> <li>• Assign owners to the teams.</li> <li>• Function as default admin for the teams they create.</li> <li>• Request AARI admin to assign their team to processes.</li> </ul>
AARI user	<b>AAE_Robotic Interface User</b>	<ul style="list-style-type: none"> <li>• Create and access requests.</li> <li>• Submit and access tasks.</li> </ul>

### Team roles and permissions

The following table explains the users, their roles and permissions within an AARI team.

Team Role	Control Room Role	Team Type	Permissions
<b>Admin</b>	<b>AAE_Robotic Interface Manager</b>	<b>Shared</b>	<ul style="list-style-type: none"> <li>• Create</li> <li>• View all</li> <li>• Delete all</li> <li>• Assign all</li> <li>• Modify team</li> </ul>
		<b>Private</b>	<ul style="list-style-type: none"> <li>• Create</li> <li>• View all</li> <li>• Delete all</li> <li>• Assign all</li> <li>• Modify team</li> </ul>
<b>Owner</b>	<b>AAE_Robotic Interface User</b>	<b>Shared</b>	<ul style="list-style-type: none"> <li>• Create</li> <li>• View all</li> <li>• Delete all</li> <li>• Assign all</li> </ul>
		<b>Private</b>	<ul style="list-style-type: none"> <li>• Create</li> <li>• View all</li> <li>• Delete all</li> <li>• Assign all</li> </ul>
<b>Member</b>	<b>AAE_Robotic Interface User</b>	<b>Shared</b>	<ul style="list-style-type: none"> <li>• Create</li> <li>• View all</li> <li>• Delete</li> <li>• Assign all</li> </ul>

Team Role	Control Room Role	Team Type	Permissions
		<b>Private</b>	<ul style="list-style-type: none"> <li>• Create</li> <li>• View</li> <li>• Delete</li> <li>• Auto-assign</li> </ul>

**Note:** The **AAE\_Robotic Interface Manager** role sets the AARI manager to automatically have an admin team role.

### Example

Consider two teams, Finance and HR, and their team roles as given in the following table:

Finance (Private)		HR (Shared)	
User	Role	User	Role
User A	Owner	User X	Member
User B	Member	User Y	Member
User C	Member	User Z	Owner

For any process:

- User A can view and delete all the requests created inside the team Finance.
- Users B and C can view and delete only their requests inside the team Finance.
- Users X, Y, and Z can view all the requests but can delete only their request inside the team HR.
- User Z can view and delete all the requests created inside the team HR.

## Configuration - set up roles

Configure users and assign them the AARI license and relevant roles and permissions to start using the web interface.

As AARI is already installed in the Control Room, you do not need to install it separately in the web interface.

The primary users involved in the configuration stage are as follows:

- Control Room administrator: The Control Room administrator creates users and assigns AARI roles (AARI admin, manager, and user) with the AARI licenses.

*Create users for Automation Anywhere Robotic Interface*

- AARI admin: The AARI admin creates the scheduler user and allocates Control Room resources required to run a process.

*Configure scheduler user for AARI on the web*

### Related concepts

[AARI web interface users](#)

Various users are involved in AARI on the web interface and each user contributes in different ways to help the automate the business requirements.

## Create users for Automation Anywhere Robotic Interface

Create the Automation Anywhere Robotic Interface (AARI) admin, manager, and users to use the AARI functionality for business processes. The Control Room admin creates users and assigns the required system roles.

Ensure that you have purchased the AARI user license for your business users.

---

**Note:** These roles are only applicable for the web interface.

---

1. From your local machine, log in to your Control Room as administrator.
2. Go to **Administration > Users**.
3. Click **Create user**.  
The icon is located at the top-right of the **Users** table.  
The **Create user** page is displayed.
4. In the **General Details** section, enter the following user details:

<b>Enable User</b>	Select the check box so that the user can log in immediately.
<b>Username</b>	Enter a unique user name.
<b>Description</b>	Optional: Enter a description for the user.
<b>First name</b>	Optional: Enter the first name of the user.
<b>Last name</b>	Optional: Enter the last name of the user.
<b>Password</b>	Type and confirm a password for the user. Ensure the password follows any necessary password policy.
<b>Email</b>	Enter and confirm the email address for the user. If SMTP is enabled, the user is sent an email to this address to confirm the account. Click the URL in the email to log in to the Control Room and set up your credentials. All important Control Room notifications will be sent to this email address.

5. In the **Select Roles** section, select one of the following roles from the **Available roles** column:

Role	Select this role
<b>Admin</b>	<b>AAE_Robotic Interface Admin</b>
<b>Manager</b>	<b>AAE_Robotic Interface Manager</b>
<b>User</b>	<b>AAE_Robotic Interface User</b>

6. Click the right arrow to move the role to the **Selected** column.
7. In the **Allocate a device license** section, select the following:

Role	Action
<b>Admin</b>	Retain the default <b>None</b> . The user with administrator role has access to the Control Room and AARI on the web.

Role	Action
<b>Manager</b>	<p>Retain the default <b>None</b>.</p> <p>You can optionally assign the AARI user license to create a request or submit tasks.</p> <p>The user with manager role has access to AARI on the web.</p>
<b>User</b>	<p>Assign the AARI user license. You can also optionally assign the attended Bot Runner license to run local bots or use the desktop interface.</p> <p>The user has access to AARI on the web.</p>

8. In the AARI licenses section, select the **AARI user** check box.
9. Click **Create user**.  
The new user is displayed in the User table. If SMTP is enabled, an email will be sent to the new user inviting them to log in.

## Configure scheduler user for AARI on the web

You can configure a scheduler user (global scheduler or per process scheduler) to allocate the Control Room resources (devices and unattended Bot Runners) to AARI on the web interface.

Complete the prerequisites: [Prerequisites to configuring AARI scheduler user](#).

1. Log in to the Control Room as an AARI administrator.  
AARI admins can create device pools in the Control Room.
2. Navigate to **Devices > My device pools**.
3. Create a device pool (for example: **AARI-pool**).

[Create device pools](#)

---

**Note:** The owner of the device pool is the AARI administrator. At least one device pool is required for configuring AARI on the web.

---

4. Select your custom role (**AARI-pool-scheduler**) in **Device Pool Consumers**.
5. Save your changes.
6. Navigate to the web interface either by clicking the **settings page** link in the **My device pools** screen or log in to the web interface as an AARI administrator.

7. Select the scheduler user by choosing one of the following options:

You can either select the global scheduler (common scheduler to run all processes) or a scheduler for each process. The AARI process uses the device pool and unattended Bot Runners configured with this user for each bot deployment.

Scheduler Type	Steps
<b>Global scheduler</b>	<ol style="list-style-type: none"> <li>a. Navigate to the <b>Process Setup</b> page.</li> <li>b. Click <b>Edit</b> in the <b>Global scheduler</b> field.</li> <li>c. Click <b>Refresh the scheduler list</b>.</li> <li>d. Select the available scheduler user from the drop-down menu.</li> <li>e. Click <b>Save</b>.</li> </ol>

Scheduler Type	Steps
<b>Scheduler (per process scheduler)</b>	<ol style="list-style-type: none"> <li>a. Navigate to <b>Manage &gt; Process setup</b>.</li> <li>b. Select the process to configure the scheduler user.</li> <li>c. In the <b>Edit Process</b> page, select the scheduler user from the drop-down menu in the <b>Scheduler</b> field.</li> <li>d. Click <b>Save</b>.</li> </ol>

**Note:** By default, **Global scheduler** is selected if you have not set a **Scheduler** for any process.

## Prerequisites to configuring AARI scheduler user

You must perform certain tasks as prerequisites to configuring the scheduler user to run the AARI processes in the web interface.

1. Log in to the Control Room as an administrator.
2. Navigate to **Administration > Roles**.
3. Create a custom role (for example, AARI-pool-scheduler).
  - Create and assign roles*
  - a) Set the permissions to **View my bots, View packages, Run my bots, and AARI Scheduler**.
  - b) Select the unattended users in the **Run As** section.
  - c) Save your changes.
4. Create a user (for example AARI-scheduler-user) and assign the custom role (AARI-pool-scheduler) you created to this user.

## Configure processes

AARI provides front-office and back-office automations, where the Bot Creator user creates a process workflow with human and bot tasks as per the business requirement.

A Bot Creator user can configure a process in the process editor in the Control Room. The process editor provides a drag-and-drop interface to help create process flows. It enables the user to configure when a bot should be executed. It also displays correct data to the users and exchanges the data across multiple teams.

## Designing processes

A process consists of human and bot tasks. A process contains the following components:

- An entry form which is the first step in a process.
- A sequence of process elements as follows:
  - Forms or TaskBots
  - Input, output, and meta-variables to share data
- Logical conditions such as **If, Else** for internal and conditional branching of the process.

- End states to close each request such as completed, failed, or canceled.



## Designing forms

A Bot Creator user can create a form and enter the required data by using form elements that can be rendered in the web interface. They can add or remove form actions when creating processes.

As a user, you can interact with the form only when it is assigned to you. If the form is unassigned, it is not enabled and is read-only. To edit the form, you can assign the form either to yourself or to any member of the team who has access to the process. After editing the form, the assignee can either submit the form or use any other action options. After the form is submitted or an action option is used, the case view displays the next step or task.

In the web interface, the following elements are supported in a form:

- Checkbox
- Date
- Dropdown
- Hyperlink
- Label
- Number
- Radio Button
- Rich Text Editor
- Select File
- Table
- Text Area
- Text Box

## Designing TaskBots

A Bot Creator user can create a TaskBot that will execute inside the process by using the input and output variables. When the **Use as input** check box is selected, the process passes data into the input variables, and when the **Use as output** check box is selected, the process gets data from the output variables after bot execution.

## Process workflow

The following workflow describes the steps involved in building an AARI process and making it available in the web interface:

1. *Create an AARI process.*
  - a. *Create a TaskBot.*
  - b. *Create an AARI form.*
2. *Check in an AARI process.*

## Other tasks

Depending on the requirement, a Bot Creator user can also perform other tasks after creating a process.

- If there is a change in the requirement, a Bot Creator user can check out the process to their private workspace and edit the process according to the requirement.

*Check out an AARI process.*

- The Bot Creator can test the process before checking it in by running it in the private workspace.

You can run the process either in the public or the private workspace using the **Run** option in the process editor. The bots in the private process executes on the default device of the Bot Creator.

When the private process is executed, the Bot Creator can create a request, enter data in the initial form, and run their request from the private workspace. Requests created from the private process execution can be viewed only by the user creating the request. Requests created from the public process execution can be viewed by the AARI administrator. Managers and users can view the requests only if they have access to the process.

*Run an AARI process.*

- Access a process from one Control Room to another by either importing or exporting the process. For example, if a process is developed and tested in the staging pod and is now ready for production, it can be exported from the staging pod. Similarly, this exported process can imported into the production pod.

- *Import an AARI process.*
  - *Export an AARI process.*

- If a requirement becomes redundant, the created process can be deleted.

*Delete an AARI process.*

## Related concepts

### [AARI web interface users](#)

Various users are involved in AARI on the web interface and each user contributes in different ways to help the automate the business requirements.

## Create an AARI form

Create an Automation Anywhere Robotic Interface (AARI) form to provide interaction between humans and bots. You can enter the required data using form elements that can be rendered in the web interface. You can add or remove form actions when creating the process.

- You must have a Bot Creator license.

- You must be assigned a custom role with the create folder permission.

Forms in AARI can be displayed in two scenarios:

- Case creation: This is the initial form that is displayed when you want to create a new case and enter the required business data.
- Form step: This form is displayed to show information and prompt for additional inputs.

1. Click **Bots > My Bots > Create new > Form**.
2. In the **Create form** page, enter a name for the new form.  
Forms are saved in the `\Bots\` folder by default. Click **Browse** to change the default folder.
3. Click **Create & edit**.  
The form builder page appears with a single row **Column** layout.
4. If you want to delete a row, click the vertical ellipsis in the form layout and click **Delete row**.
5. Confirm the delete action in the confirmation message.
6. Drag the required element into the form from the **Elements** panel on the left.
7. Use the **Properties** panel on the right to update or change the form properties.
8. Click **Save**.
9. Click **Close**.

*Create an AARI process*

## Create an AARI process

Create an Automation Anywhere Robotic Interface (AARI) process workflow to address your business requirements. You create the process in a process editor that incorporates human and bot tasks.

- You must have a Bot Creator license.
  - You must be assigned a custom role with the create folder permission.
1. Create a process:
    - a) From your local machine, log in to your Control Room as a Bot Creator.
    - b) Click **Bots > My Bots > Create new > Process**.
    - c) In the **Create process** page, enter a name for the new process.  
Processes are saved in the `\Bots\` folder by default. Click **Browse** to change the default folder.
    - d) Click **Create & edit**.
    - e) Optional: Click the process name to rename it.
  2. Add an initial form to the process by clicking **Start**.
  3. From the **Start** panel, perform these steps:
    - a) Browse and **Select initial data form**.
    - b) In the **Request display name field**, enter any text or insert a variable.  
This is the input variable. A dynamic title is created for this request that will be displayed in the web interface and will serve as a reference.
    - c) Optional: In the **Data privacy tag** field, enter a text or variable to generate hidden custom output.
    - d) Click **Apply**.
  4. Add a **Bot Task** to the process by dragging the element from the **Element** panel.

5. From the **Bot Task** panel, perform these steps:
  - a) Enter a name in the **Element name** field.
  - b) Enter the task name in the **Task display name** field.  
The task display name appears in the web interface as a reference.
  - c) Optional: Select the **Hide this task after completion** check box.  
After task completion, the **Bot Task** is not displayed to the user in the web interface.  
  
To display the hidden task, select the **View hidden tasks** check box in the tasks view page of the web interface.
  - d) Browse and select the TaskBot.
  - e) Optional: In the **Data privacy tag** field, enter a text or variable to generate hidden custom output.
  - f) Select the check box in **Input values** and specify a variable.  
The variable input expected by the bot is mapped with the variable that will be populated when creating the request.
    1. Select a task in the **Process task** field.
    2. Select a type in the **Variable type** field.  
You can choose **Input, Output, or Meta**.  
See [AARI variable types](#).
    3. Specify your variable in the **Variable** field.
  - g) Click **Apply**.
6. Add a condition to the process by dragging the condition from the **Elements** panel.  
You can choose **If/Else pair** or **Else if**.
7. From the **Condition** panel, perform these steps:
  - a) Optional: Add a description in the **Description** field.
  - b) Optional: Add a message in the **Display message** field.  
The display message you enter is shown in the request view page in the web interface.
  - c) Click **Add Condition** to add a condition.  
You can choose a condition from the four available types: **Boolean, Datetime, Number, or String**.
  - d) Click **Apply**.
8. Add the **Human Task** to the process by dragging the element from the **Element** panel.

- 9.** From the **Human Task** panel, perform these steps:
- a) Enter a name in the **Element name** field.
  - b) Enter the task name in the **Task display name** field.  
The task display name is displayed in the web interface as a reference.
  - c) Optional: Select the **Hide this task after completion** check box.  
After task completion, the **Human Task** is not displayed to the user in the web interface.  
To display the hidden task, select the **View hidden tasks** check box in the tasks view page of the web interface.
  - d) Select the **Make the form read-only** check box.  
The **Human Task** does not require any input and executes automatically to the next task.
  - e) Select the **Assign this task to the user who created this request** check box.  
The task is automatically assigned to the user creating this request in the web interface.
  - f) In the **Select form** field, browse and select the second form created.  
This form displays the result.
  - g) Optional: In the **Data privacy tag** field, enter a text or variable to generate hidden custom output.
  - h) In the **Add form button** field, specify your button details.
    - Specify a name in the **Button label** field.
    - Select a style in the **Button style** field.  
You can choose between **Primary**, **Secondary**, or **Cancel**.
    - Click **Add button** to add any additional buttons.
  - i) Select the check box in the **Feed data into form** field.
    - 1.** Select a task in the **Process task** field.
    - 2.** Select a type in the **Variable type** field.  
You can choose **Input**, **Output**, or **Meta**.  
See [AARI variable types](#).
    - 3.** Specify your variable in the **Variable** field.
- 10.** Optional: Add the **Process Task** option to the process by dragging the element from the **Task** panel.

**11.** From the **Process Task** panel, perform these steps:

- a) Enter a name in the **Element name** field.
- b) Enter the task name in the **Task name** field.  
The task display name appears in the web interface as a reference.
- c) Optional: Select the **Hide this task from users** check box.  
After task completion, the **Process Task** is not displayed to the user in the web interface.  
To display the hidden task, select the **View hidden tasks** check box in the tasks view page of the web interface.
- d) Select either the **Public folder** or **Private folder** and browse and select the process.
- e) Optional: In the **Data privacy tag** field, enter a text or variable to generate hidden custom output.
- f) Select the check box in **Input values** and specify a variable.
  1. Select a task in the **Process task** field.
  2. Select a type in the **Variable type** field.  
You can choose **Input**, **Output**, or **Meta**.  
See [AARI variable types](#).
  3. Specify your variable in the **Variable** field.

**12.** Add the **Filter Task** option to the process by dragging the element from the **Task** panel.

**13.** From the **Filter Task** panel, perform these steps:

- a) Enter a name in the **Element name** field.
- b) Enter the task name in the **Task display name** field.  
The task display name is displayed in the web interface as a reference.
- c) Optional: Select the **Hide this task** check box.  
After task completion, the **Filter Task** is not displayed to the user in the web interface.  
To display the hidden task, select the **View hidden tasks** check box in the tasks view page of the web interface.
- d) Enter a variable in the **Variable to be filtered** field.
- e) In the **Filtered type** field, select an option.  
For example, for a dictionary variable, the **Check each key/value pair in the dictionary** or **Check entire dictionary** options are available for you to choose.
- f) In the **Filter criterion** field, select a condition.  
After you select a condition, specify the **Source variable**, **Operator**, and **Target value** fields.

**14.** Add the **End point** by selecting the **Go to** or **End process**.

**15.** From the **End point: Go to** panel, perform these steps:

- a) In the **Select target task** option, specify the task by choosing **Bot Task** or **Human Task**.
- b) Select the **Override the task assignment setting** check box and from the drop down, you can choose either **Unassign the task** or **Assign the task to the user who created the request**.  
Depending on your choice, the task is unassigned or the user creating the request can automatically view the task assigned to them in the web interface.

- 16.** From the **End point: End process** panel, perform these steps:
- Choose the type in the **End process status** field.  
You can choose between **Completed**, **Failed**, or **Cancelled**.
  - Optional: Specify a name in the **Update request title** field.
  - Optional: Add a message in the **Display message** field.  
The display message you enter is shown in the last step of your task in the request view.
  - Click **Apply**.
  - Click **Save** to save the process.
- 17.** If you want to preview your bot or forms information in the process editor (**Edit process** page) in both your public and private workspace, follow these steps.
- Click the vertical ellipsis next to the **Bot Task** or the **Human Task**.
  - Select either the **Preview bot** or **Preview form** option.  
In the public workspace, these options display the **Bot name preview** or **Form name preview** page. The page enables you to quickly view a bot or form.  
In the private workspace, these options display the **Edit Task Bot** or **Edit form** page in which you can make changes to your TaskBot or form.

## Related tasks

### [Create your first bot](#)

Follow these steps to create your first bot that prints the message, `Go be great!`, the Automation Anywhere version of `Hello World!`

### [Create an AARI form](#)

Create an Automation Anywhere Robotic Interface (AARI) form to provide interaction between humans and bots. You can enter the required data using form elements that can be rendered in the web interface. You can add or remove form actions when creating the process.

## AARI variable types

Data flow (workflow engine) is the core part of a process that moves data between each task. Tasks require variables in order to run properly and three types of variables are available: input, output, and meta-type variables.

## Variable types

### Input

Users can use this type of variable in the process editor to return values that went "in" a task.

### Output

Users can use this type of variable in the process editor to return values that went "out" a task.

### Meta

Users can use this type of variable in the process editor to return high-level information about the request of a task.

## Variable entities

Two types of entities can hold variables:

### Request

Requests can only hold meta-type variables and have the following form: `$(meta variable name)]$`

This meta-type variable value is from the request.

### Task

Tasks can hold three types of variables (input, output, meta) and have the following forms:

- `$(task).<input|output>[<variable name>]$:` This variable value is read from the task input or output.
- `$(task).<meta variable name>$:` This meta-type variable value is read from the task.

## Date time variables

Name	Entities	Description
<i>createdOn</i>	Request, Task	Shows the date when the request or task was created. Example: <code>\$(createdOn\$</code> or <code>\$(Approval_Task.createdOn\$</code>
<i>updatedOn</i>	Request, Task	Shows the date when the request or task was last updated. Example: <code>\$(updatedOn\$</code> or <code>\$(Approval_Task.updatedOn\$</code>

## Dictionary variables

Name	Entities	Description
<i>assignedTo</i>	Task	Shows information about the user who is assigned to the task. Dictionary key: <code>{id}, {username}, {email}</code> Example: <code>\$(Approval_Task.assignedTo\$</code>
<i>createdBy</i>	Request	Shows information about the user who created the request. Dictionary key: <code>{id}, {username}, {email}</code> Example: <code>\$(createdBy\$</code>

## Number variables

Name	Entities	Description
<i>executionCount</i>	Task	Shows the number of times the task was run. Example: <i>\$Name_Bot.executionCount\$</i>
<i>id</i>	Request, Task	Shows the numerical ID of a request or task. Example: <i>\$id\$</i> or <i>\$Approval_Task.id\$</i>
<i>assignedTo{id}</i>	Task	Shows the numerical ID of the user who is assigned to the task. Example: <i>\$Approval_Task.assignedTo{id}\$</i>
<i>createdBy{id}</i>	Request	Shows the numerical ID of the user who created the request. Example: <i>%createdBy{id}\$</i>

## String variables

Name	Entities	Description
<i>status</i>	Task	Shows the label of the button clicked (action) for the task or the return code for a bot task (equal to <b>failed</b> when the task fails). Example: <i>%Approval_Task.status\$</i> or <i>\$Name_Bot.status\$</i>
<i>title</i>	Request, Task	Shows the title of the request or task. Example: <i>%title\$</i> or <i>%Approval_Task.title\$</i>
<i>type</i>	Request	Shows the task type (equal to <b>BOT</b> for bot tasks). Example: <i>%Task.type\$</i>
<i>assignedTo{username}</i>	Task	Shows the username of the user who is assigned to the task. Example: <i>\$Approval_Task.assignedTo{username}\$</i>
<i>createdBy{username}</i>	Request	Shows the username of the user who created the request. Example: <i>\$createdBy{username}\$</i>
<i>assignedTo{email}</i>	Task	Shows the email of the user who is assigned to the task. Example: <i>\$Approval_Task.assignedTo{email}\$</i>
<i>createdBy{email}</i>	Request	Shows the email of the user who created the request. Example: <i>\$createdBy{email}\$</i>

## Delete an AARI process

As an AARI administrator or a user with **Delete from Public** permission, you can delete an AARI process in the public workspace.

While deleting a process, keep the following considerations in mind:

- You can delete processes that have open requests.
    - After a process is deleted, you cannot access the process even if the requests still exist. The scheduled bots can still be executed, but the forms cannot be submitted. If you republish the same process, the old requests can be restored and team permissions can be created again.
  - You cannot delete checked-out processes.
1. Log in to the Control Room as an AARI administrator or a Bot Creator user.
  2. In the public workspace, click **Bots > My bots**.  
The **My bots** page is displayed with the list of folders or files containing the processes.
  3. Select the process you want to delete, open the actions menu (vertical ellipsis), and click **Delete process**.  
You must first delete the process in order to delete the bots or forms within the process.
  4. Select **Yes, delete** to confirm.  
When the process is deleted from the public workspace, it is removed from the process management page in the web interface. Additionally, if the process is already assigned to any AARI user or team, access is removed after the process is deleted from the public workspace.

## Run an AARI process

In the Control Room, as a Bot Creator, you can run a process from the process editor in the private workspace.

Keep in mind the following considerations:

- When the process is executed in the private workspace, the Bot Creator can create a request and enter data in the initial form.  
In the private workspace, the bots are executed on the default device of the Bot Creator.
- Requests created from the private workspace can be viewed only by the user creating the request.  
The AARI administrator cannot view the processes executed from the private workspace in the process management page.

1. Log in to the Control Room as a Bot Creator user.
2. In the private workspace, click **Bots > My bots**.  
The **My bots** page is displayed with the list of folders or files containing the processes.
3. Click the process name.
4. When the process opens in the process editor, click **Run**.  
A window opens, where you are prompted with the initial form.

## Check in an AARI process

Check in an Automation Anywhere Robotic Interface (AARI) process to the public workspace from the private workspace to make it available for other users.

- You must have a Bot Creator license.

- You must be assigned a custom role with the following permissions:
    - Required: Check-in and check-out permission
    - Optional: Create folder permission
    - Optional: View packages permission
  - To check in a process with dependent folders and files, ensure you have the following:
    - Create folder permission.

If you are checking in a process from your private workspace and if the folder in which the process is present does not yet exist in the public workspace, you must have the create folder permission to successfully check in the process.
    - Check-in permission on the dependency folder.
1. Log in to the Control Room as a Bot Creator user.
  2. In the private workspace, click **Bots > My bots**.

The **My bots** page is displayed with the list of folders or files containing the processes.
  3. Select the process you want to check in, open the actions menu (vertical ellipsis), and click **Check in process**.
  4. In the **Check in Process** window, add your comment and click **Check in**.

The process appears in the same folder structure in the public workspace.

## Check out an AARI process

Check out an Automation Anywhere Robotic Interface (AARI) process from the public workspace to create an editable copy of the process.

- Ensure you have the Bot Creator license to check out a process to your private workspace.
  - To check out a process with dependent folders and files, you must have the following:
    - Create folder permission
    - Check-out permission on the dependency folder
1. Log in to the Control Room as a Bot Creator user.
  2. In the public workspace, click **Bots > My bots**.

The **My bots** page is displayed with the list of folders or files containing the processes.
  3. Select the process, open the actions menu (vertical ellipsis), and click **Check out process**.

The process appears in the same folder structure in the private workspace.

## Import an AARI process

You can import an Automation Anywhere Robotic Interface (AARI) process from one Control Room to another.

- Ensure that the following rights are enabled to import processes:
  - Import process permission
  - Create folder permission, if it is required
  - Check-in permission
  - Manage package permission
- The process directory path is case-sensitive. So ensure that the export and import paths use the same case in the Control Room to avoid any process execution failure.

- You require a Bot Creator license to import the process either into the private or public workspace.

In this task, the required process is already exported and an email is received with a link to the zip file containing the package to import.

Any previously exported process is located in the public repository and must be imported and checked in so that it can be deployed from the new Control Room.

You can import the process only into your private workspace. After the process is imported, you must then check in the imported files to the public workspace in order to complete the import process activity.

1. Navigate to **BOTS > My bots**.
2. Click **Import bot** and browse and select the process to import.

---

**Note:** This option currently applies to both bots and processes.

---

3. Select the option to import a process into the private or public workspace.
4. Set the option for importing the process based on whether a previous version of the process resides in the destination location.  
During the import, if a file already exists, you can choose to either skip the process during import or overwrite the existing process and file.
5. Click the **Import bot** icon.
6. Navigate to the private repository to find and select the imported process.
7. Click **Check in process**.

---

**Important:** All related dependencies are checked in. If the process is imported to a public folder, then it has to be checked out and then checked in again for it to appear on the web interface. However, if the process is imported to a private folder, then it can only be checked in but not checked out.

---

8. Update the comment for the check-in process.
9. Click **Check in**.  
On completion, the imported process is placed in the public repository and is ready for deployment from the new Control Room.

## Export an AARI process

You can export an Automation Anywhere Robotic Interface (AARI) process from one Control Room to another.

- Only processes within the public workspace can be exported. To export a process, check in the process into the public workspace.
- Ensure that you have the correct role and permissions to export the process, including the **View package** permission.
- To receive the link to the exported package through email, enable SMTP.

[Email server settings](#)

- To export the process from one Control Room to another, both Control Rooms must be the same version.

The Control Room maintains a maximum of 10 GB of historical export files in the download directory. Files are deleted on a first-in/first-out basis in order to maintain this threshold.

1. Navigate to **BOTS > My bots**.

2. Click the **Export bot**, browse the public directory, and select the process to export.

---

**Note:** This option currently applies to both bots and processes.

---

The selected process as well as the required dependencies are displayed.

3. Click **Next**.  
The process and its dependencies are ready for export and displayed in the **Review Dependencies** window.
4. Click **Next**.  
All related packages are displayed.
5. Select the necessary packages associated with the process to export.  
You can select **Exclude process packages** to remove all packages from the export.
6. Click **Export bots and files**.  
If you have configured SMTP, an email is sent, which contains a link to the zip file of the exported package.  
If you have not configured SMTP, perform the following steps to access the link to the zip file of the exported package:
  - a) Navigate to **ACTIVITY > Historical**.
  - b) Search and view the historical activity of the exported package.
  - c) Click **Download exported zip file**.  
A link to download the zip file is displayed.
7. Use the link to download the zip file and save it to a location for importing it to another Control Room.

Import the process to an Control Room.

## Deploy processes

AARI on the web interface provides a dedicated workspace to organize processes, create requests, and run and view tasks. Managers can create new teams and manage their teams' roles and deployment of tasks.

The checked-in processes are available on the web interface and can be assigned to the teams so that the team members can create requests and complete tasks.

The three main components involved in deploying a process are as follows:

- *Team management*
- *Process management*
- *Request management*

## Deployment workflow

The following workflow describes the steps involved in deploying a process by using the web interface:

1. *Create an AARI team and assign team roles to members.*
2. *Assign an AARI team to a process.*
3. *Create a request and complete a task.*

## Other tasks

Depending on the requirement, you can also perform the following tasks:

- As an AARI manager, you can either assign or unassign tasks to your team members.

*Assign or unassign a task .*

- To clear the memory space, as an AARI user, manager, or admin, you can delete the requests that are no longer required.

*Delete a request.*

- To make process selection easier at the time of request creation, as an AARI user or manager, you can view, pin, or search for your assigned processes.

*View and search for a process.*

- As an AARI user, to quickly search for a specific request created, you can filter and search for that request.

*Filter and search for a request.*

- As an AARI user, when you have many tasks created from multiple requests, you can filter and search for a specific task.

*Filter and search for a task.*

## Upgrade changes

For users who had any access to a process or created requests from a process (regardless of existing team assignment), when they upgrade to Automation 360 v21, their team remains the same with existing team members and process that were assigned to their team. The team is now set to a **shared** team type so all members can view the migrated process and requests. The AARI users and AARI admins or managers are converted to team **member** and **admin** respectively. Existing processes assigned to a team are shown as **Team Migrated for Process** for reference of any migrated processes. Teams will be created for existing processes with this name. User should now be able to create requests in a team. For AARI managers (process manager) who could create requests without assigning process to teams. After the upgrade, AARI managers must create teams, ask the AARI admin to assign their teams to a process in order to create new requests.

### Related concepts

#### [AARI web interface users](#)

Various users are involved in AARI on the web interface and each user contributes in different ways to help automate the business requirements.

## Team management

Team management is an essential function of AARI in the web interface. The basis of request and process assignment is dependent on the team setup.

The team configurable in AARI helps business managers to define the following aspects:

- How a request can be created
- How a request is visible to the other users
- Who can read, update, or delete requests

A team contains users with specific team roles—admin, owner, and member. The admin has the ability to modify their team. The admin has the ability to modify their team. By default, the AARI manager is the admin of their team. They can create new teams, manage existing teams, assign team roles (admin,

owner, member) to members, and add members to their team. As an admin, an AARI manager can add other admins to their teams. A team can have more than one admin but must have at least one admin. To access a process and create new requests, the AARI manager must request the AARI admin to assign the AARI manager's team to a process.

Each team is configured to a team type (shared or private) and depending on that type, requests that can be viewed and accessed by members of that team might change.

- **Shared:** All the requests can be viewed by admins, owners, and members of that team.
- **Private:** Requests can be viewed only by the users creating those requests and the owner and admin of the team.

The team roles are based on the Control Room role assigned to the user. Each team role has a subset of permissions and actions that can be performed by that role. These sets of permissions vary between the shared and private team types.

### Related concepts

#### [AARI web interface users](#)

Various users are involved in AARI on the web interface and each user contributes in different ways to help automate the business requirements.

## Process management

A process contains human tasks and bot tasks. The AARI teams can use the process to automate their tasks by creating requests.

The AARI admin performs the global process management tasks. The AARI admin can view the checked-in processes from the Control Room and assign teams to a process for request creation.

You can view your requests on the **Processes** page. For easy access to a specific process, you can sort the processes by name in ascending or descending order and toggle the pinning of a process. The responsive view of the **Processes** page adjusts the display to your screen size. To guide with your team assignment, you can also reference the team from which a request is created by referring to the team name added in the process tile on the **Processes** page.

## Request management

A request must be created to automate processes to complete assigned tasks. Members of a team create requests and complete the corresponding tasks.

Requests must always be created within a team. This ensures that the teams assigned to the same process cannot see each other's data anymore. By default, an AARI user, selected as an owner or member of their team, can create requests because their role has the **AARI user** license, which enables them to access the web interface and create requests.

The structure of request creation is as follows:

- An AARI user (team owner or member) can access and view all the processes that are assigned to a team on the **Processes** page.
- The AARI user must provide all the required information in an **initial form**.
- The bots and human tasks run in the **request view** page, which contains high-level details of the tasks.
- The task information is displayed in the **Requests** page, for the AARI user to verify.
- The AARI user can view their requests on the **Requests** page. They can manage or sort their existing requests by using a filter.
- A request can be created by either a user or a bot on the **Edit Process** page. If the request is created by a user, the process is displayed on the **Processes** page. If the request is created through a bot, the user cannot create a request or view the process.

## Create a request and complete a task

An AARI user can create a new request from processes that is their team is assigned to, enter required information in an initial form, and complete tasks.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface User** role for the AARI user.
- Assigned the AARI user license.
- Have access to the web interface.

### 1. Log in to the web interface as an AARI user.

As an AARI user, you are now assigned to a team with an owner or member team role, created by the AARI manager or admin.

### 2. Navigate to the **Processes** page.

This page shows all available processes that your team was assigned to by the AARI admin.

### 3. Select an assigned process.

The initial form appears and shows the required fields for you to complete. These fields are from supported interactive form elements.

---

**Important:** Processes now includes team names associated to the process that the team is assigned to. The **Team Migrated For Process** team name indicates that the process is available to team members who had previous access to that process, regardless of team assignment, before the Automation 360 upgrade.

---

### 4. Complete the required information to the initial form.

### 5. Click **Submit** to confirm the information and progress.

Optionally, you can click **Cancel** to discard your changes.

### 6. View the request view page.

Your process is now running, and you might be prompted to complete pending tasks in the request tabs.

### 7. Complete the required task information in the request tab.

As the bot completes its task, it might prompt you to take over and complete the remaining steps.

### 8. View your request status.

Your request is now completed.

### 9. Navigate to **Requests > All requests** to view all requests created in the team.

### 10. Optional: Click **Create request** button to create a new request from the **Request** page.

## Delete a request

An AARI user, manager, or administrator can delete requests that are no longer required. Deleting requests helps clear the memory space. You can also recover a deleted request if necessary.

Ensure you have completed the following:

- Assigned a system-created **AAE\_Robotic\_Interface User** role for the AARI user, **AAE\_Robotic\_Interface Manager** for the AARI manager, or **AAE\_Robotic\_Interface Admin** role for the AARI administrator.

- For the AARI user, manager, or admin:
  - Assigned the AARI user license.
  - Provided access to AARI on the web.

Only requests that are in **Aborted**, **Cancelled**, **Failed**, or **Completed** status can be deleted.

- An AARI administrator can delete any requests.
- The AARI manager can delete requests of the team for which they are the owner.
- The AARI user can delete only the requests they have created.

1. Log in to the web interface.
2. Navigate to the **Request** tab.
3. From the list of requests, select the request or requests you want to delete and click the delete icon. A confirmation message appears to confirm the deletion.
4. Click **Yes, delete** to delete the selected requests.
5. Optional: To recover a deleted request or requests, perform these steps:
  - a) Navigate to the **Recycle Bin** tab.
  - b) Select the requests you want to recover and click the recover icon. A confirmation message appears to confirm recovery of the request.
  - c) Click **Yes, recover**.  
The requests are recovered and appear in the **Requests** tab.

## Create an AARI team and assign team roles to members

An AARI manager is a team admin who can create new teams, add members to their team, and assign new team roles. AARI admin can also configure a team but does not have a team role.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface Manager** role for the AARI manager.
- Provided a system-created **AAE\_Robotic\_Interface Admin** role for the AARI admin.
- Have access to the web interface.

1. Log in to the web interface as an AARI manager or admin.
2. Navigate to **Mangage > Team setup**.  
The **Team Setup** page enables the AARI manager or admin to view all of their teams and provides the option to create a new team.
3. Click **Create new team**.  
A **Create new team** window prompts for the AARI manager or admin to enter the team details.
4. Enter a team name in the **Team Name** field.
5. Optional: Enter a description in the **Description** field.
6. Select either the **Shared** or **Private** option in the **Request Visibility** field.  
If the **Shared** option is selected, then all requests that are created is accessible to members of the team. If the **Private** option is selected, requests will be available only to the member who created that request and the owners and admins of the team.
7. Click the **+** (plus) icon to add members to the team.  
The **Add members to** window appears to search for members to add.
8. Search for a name in the search bar.

9. Click on their name to confirm the member.
10. Click **Apply**.  
Members are now successfully added to the team.
11. Optional: To remove a team member, click the **trash** icon next to the member name.
12. Navigate to **Roles** next to each member names.  
Each member's team role is set to **Member** by default.
13. Click **Member** to change the team role when applicable.
14. Select **Member**, **Owner** or **Admin** to designate the team role.

---

**Important:** A team must have at least one **Admin** as a member. Only the AARI manager can be assigned the **Admin** team role, as the roles are based on the Control Room roles assigned to the user. A team however can be comprised of many admins if necessary.

---

15. Click **Save**.
16. Optional: To edit an existing team, click the team's name in **Team** column within **Team Setup** page.  
The AARI manager or admin can edit a team to update their team setup or click **Delete** to erase the team entirely.

## Assign an AARI team to a process

An AARI admin can configure processes in the web interface and assign teams to a process for request creation. They access the web interface to view and manage processes in the **Process Setup** page.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface Admin** role for the AARI admin.
- Have access to the web interface.

As an AARI admin, their key function is to assign teams to a process.

1. Log in to the web interface as an AARI admin.
2. Navigate to **Mangage > Process setup**  
The **Process Setup** page enables the AARI admin to view all of the check-in processes from the Control Room and assign teams to a process.
3. Click on a process.  
An **Edit Process** window appears and shows related information about the process such as the process name, description, tags, and teams.
4. Edit the **Process name** field if necessary.
5. Optional: Enter a description in the **Description** field.
6. Click **Add tag** in the **Tags** field to add tags to the process.  
The **Add tag** window appears to search for tags to add.
7. Search for a tag description in the search bar.
8. Click on their name to confirm the tag.
9. Click **Add**.
10. Select the scheduler user from the drop-down menu in the **Scheduler** field.

---

**Note:** The **Global scheduler** option is selected by default if a scheduler is not set for any process.

---

11. Select the **by user** (default) or **by bot** options in the **Request creation** field.

---

**Important:** If the **by user** option is selected, then processes are visible in the **Processes** page for all AARI users (owners or members of team). If the **by bot** option is selected, then the request is created by a bot or another process using the **Process Task** in the process editor. A team must be selected in the **Default team to take the bot created request** field, for requests to be created by that team.

---

12. Click the **+** (plus) icon to add teams to the process.  
The **Add teams** window appears to search for teams to add.
13. Search for a team in the search bar.
14. Click on their name to confirm the team.
15. Click **Add**.  
Team are now successfully added to the process.
16. Optional: To remove a team, click the **trash** icon next to the team name.
17. Click **Save**.

## Assign or unassign a task

The Automation Anywhere Robotic Interface (AARI) manager and user can assign specific tasks to their team. They can also unassign tasks.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface Manager** role for the AARI manager.
- Provided a system-created **AAE\_Robotic\_Interface User** role for the AARI user.
- Have access to AARI on the web.

Managers can assign tasks to all members who have access to a process. Users can assign tasks to other users in the same team. Managers and users can unassign tasks.

1. Log in to the web interface as an AARI manager.
2. Navigate to the **Tasks** tab.
3. Select a task from the list.
4. Navigate to
  - **Unassigned**  
Tasks are unassigned by default.
  - **Assign to me**  
This option assigns the task to the current user.
5. Select the user.  
The task is now assigned.
6. Optional: Select **Unassigned**.  
The task is now unassigned.

## View and search for a process

The AARI user can view, pin, or search their assigned processes.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface User** role for the AARI user.

- Assigned the AARI user license.
- Have access to AARI on the web.

1. Log in to the web interface as an AARI user.
2. Click **Create request** from the home page and choose from these options:

Option	Steps
<b>View a process</b>	View your assigned process in the <b>Select a process</b> window. <hr/> <b>Important:</b> A list of processes is available in the <b>All</b> tab by default and are assigned to your team by the manager. <hr/>
<b>View a pinned process</b>	<ol style="list-style-type: none"> <li>a. Click the <b>pin</b> icon.</li> <li>b. Navigate to the <b>Pinned</b> tab.</li> <li>c. View your pinned process.</li> </ol>
<b>Search for a process</b>	<ol style="list-style-type: none"> <li>a. Click <b>Create request</b> from the home page.</li> <li>b. Navigate to the search bar.</li> <li>c. Enter your keyword.  The search bar dynamically searches your processes for common keywords. You can also search for tags.</li> <li>d. View the searched process.</li> </ol>

## Filter and search for a request

When an AARI user has created many requests, they can quickly search for a specific request.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface User** role for the AARI user.
- Assigned the AARI user license.
- Have access to AARI on the web.

Follow these steps to quickly search or filter your requests:

1. Log in to the web interface as an AARI user.  
You are now in your home page, where you can view your requests.

2. Navigate to the **Requests** tab (set by default) and choose from these options:

Option	Steps
<b>Sort</b>	<p><b>a.</b> Click on a column.</p> <p>You can choose from: <b>Status, Request ID, Process, Request title, Created , Updated or Tag.</b></p> <p>The column is sorted to ascending order by default.</p> <p><b>b. Optional:</b> Click the same column again.</p> <p>The column is now sorted to descending order by default.</p> <p><b>c.</b> View your sorted requests.</p>
<b>Search</b>	<p><b>a.</b> Click <b>Search title.</b></p> <p><b>b.</b> Search a request title.</p> <p>The search bar dynamically searches for common keywords.</p> <p><b>c. Optional:</b> Click <b>x</b> to clear keywords.</p> <p><b>d.</b> View the searched requests.</p>

Option	Steps
<b>Filter</b>	<p><b>a.</b> Click <b>Filter</b>.</p> <p><b>b.</b> In the dedicated filter window that appears, configure your content from these filters:</p> <ol style="list-style-type: none"> <li><b>1.</b> Select a status in the <b>Status</b> option. You can choose from <b>Open, Closed, Failed, and Cancelled</b>.</li> <li><b>2.</b> Select a date in the <b>Created</b> option. You can select the current date or specify any dates in the <b>From</b> and <b>To</b> fields.</li> <li><b>3.</b> Select a date in the <b>Updated</b> option. You can select the current date or specify any dates in the <b>From</b> and <b>To</b> fields.</li> <li><b>4.</b> Enter an ID in the <b>Request ID</b> field.</li> <li><b>5.</b> Enter a process name in the <b>Process</b> field.</li> <li><b>6.</b> Enter a tag name in the <b>Tags</b> field.</li> </ol> <hr/> <p><b>Note:</b> When you confirm your search criteria for the <b>Request ID, Process, and Tags</b> fields, you create a custom filter tag.</p> <hr/> <p><b>7. Optional:</b> Enter the query in the <b>Data Privacy tag</b> field.</p> <hr/> <p><b>Note:</b> This option is available only for the AARI admin. The admin can update the field and manage any information about data privacy.</p> <hr/> <p><b>c. Optional:</b> Click <b>x</b> to discard any custom filter tags.</p> <p><b>d. Optional:</b> Click <b>Reset</b> to discard all changes.</p> <p><b>e.</b> Click <b>Apply</b>.</p> <p><b>f.</b> View your filtered requests.</p>

## Filter and search for a task

When the AARI user has created many tasks, they can quickly search for a specific task.

Ensure you have completed the following:

- Provided a system-created **AAE\_Robotic\_Interface User** role for the AARI user.
- Assigned the AARI user license.
- Have access to AARI on the web.

Follow these steps to quickly search or filter your tasks:

1. Log in to the web interface as an AARI user.  
You are now in your home page, where you can view your tasks.
2. Navigate to **Tasks** tab and choose from these options:

Option	Steps
<b>Sort</b>	<ol style="list-style-type: none"> <li>a. Click on a column. You can choose from: <b>Status, Task Name, Assignee, Request ID, Request title Task Created , Task Updated.</b> The column is sorted to ascending order by default.</li> <li>b. <b>Optional:</b> Click the same column again. The column is now sorted to descending order by default.</li> <li>c. View your sorted tasks.</li> </ol>
<b>Search</b>	<ol style="list-style-type: none"> <li>a. Click <b>Search task.</b></li> <li>b. Search a task name. The search bar dynamically searches for common keywords.</li> <li>c. <b>Optional:</b> Click <b>x</b> to clear keywords.</li> <li>d. View the searched tasks.</li> </ol>

Option	Steps
<b>Filter</b>	<p><b>a.</b> Click <b>Filter</b>.</p> <p>You can also filter your tasks and choose from <b>My Completed tasks, My Pending tasks, and Unassigned tasks</b>.</p> <p><b>b.</b> Click <b>Advanced filter</b>.</p> <p><b>c.</b> In the dedicated filter window that appears, configure your content from these filters:</p> <ol style="list-style-type: none"> <li><b>1.</b> Select a status in the <b>Status</b> option. You can choose <b>Pending</b> and <b>Completed</b>.</li> <li><b>2.</b> Select a date in the <b>Task created</b> option. You can select the current date or specify any dates in the <b>From</b> and <b>To</b> fields.</li> <li><b>3.</b> Select a date in the <b>Task updated</b> option. You can select the current date or specify any dates in the <b>From</b> and <b>To</b> fields.</li> <li><b>4.</b> Enter a name in the <b>Assignee</b> field.</li> <li><b>5.</b> Enter an ID in the <b>Request ID</b> field.</li> <li><b>6.</b> Enter a name in the <b>Request title</b> field.</li> </ol> <hr/> <p><b>Note:</b> When you confirm your search criteria for the <b>Assignee, Request ID, and Title</b> fields, you create a custom filter tag.</p> <hr/> <p><b>7. Optional:</b> Enter the query in the <b>Data Privacy tag</b> field.</p> <hr/> <p><b>Note:</b> This option is available only for the AARI admin. The admin can update the field and manage any information about data privacy.</p> <hr/> <p><b>d. Optional:</b> Click <b>x</b> to discard any custom filter tags.</p> <p><b>e. Optional:</b> Click <b>Reset</b> to discard all changes.</p> <hr/> <p><b>Tip:</b> You can also navigate to <b>Filter &gt; Reset filter</b> for the same results.</p> <hr/> <p><b>f.</b> Click <b>Apply</b>.</p> <p><b>g.</b> View your filtered tasks.</p>

## Get started with AARI desktop

Use Automation Anywhere Robotic Interface (AARI) through your desktop to manage routine tasks such as validating data, retrieving approvals, and managing escalations through bots.

The following workflow describes how to use AARI to automate and manage your tasks:

### 1. Create a user:

- The Control Room administrator creates a user with a Bot Creator license.

[Create a user](#) | [Automation 360 licenses](#)

- The user logs in to the Control Room to start building bots.

[Install Bot agent and register device](#) | [Get started building bots](#)

### 2. Create forms using the Interactive forms package:

- Interactive forms enable you to design forms for submitting and regrouping data from various applications.

[Create a form](#)

- Link the form to a newly created bot or an existing bot using the Bot editor interface.

[Add a form to bot](#)

### 3. Add triggers to the bot:

Trigger loop enables you to add triggers that can run a task automatically when certain predefined events occur.

[Adding a trigger to run a bot](#)

## About AARI Assistant

Attended Bot Runner users can use the AARI Assistant application to access bots without logging into Control Room.

Control Room administrator adds Active Directory (AD) users by selecting AD domain, providing environment details, and assigning a role and device license. Administrator can further deploy the Control Room RBAC by specifying role-based privileges and permissions at the bots and Bot Runner level.

Control Room RBAC on Bot Runner users facilitate a complete isolation based on pre-defined criteria such as users across various business units or departments. This also includes the privileges that is applied at a folder level to completely and seamlessly isolate bots of one department from the other.

In a typical scenario, triggering some specific bots to complete important tasks can be one of the daily routines for attended Bot Runner users. Entire process of signing into Control Room can be time consuming. AARI Assistant reduces this effort considerably. When Bot agent is installed on a device, an application shortcut on the desktop for AARI Assistant is also created along with a **Start** menu icon.

Users with attended Bot Runner license can launch this application, use their AD credentials to sign in and review the list of available bots, and run the specific bot.

## Sign into AARI Assistant

Use the AARI Assistant application to directly run the bots without signing into Control Room.

Automation Anywhere AARI service must be running in Control Room to use AARI Assistant.

This application is designed only for user with attended Bot Runner license. A sign in error is displayed if users with any other license tries to sign in.

1. Click the **AARI** icon to open AARI Assistant.
2. Use Automation 360 credentials to sign into the application.  
All the bots that you have access to are listed.
3. Optional: Use the **Search** bar at the top to find a bot.
4. Optional: Click **Show pinned only** check box to list your pinned bots.  
Ensure you pin (similar to favorites) the most used bots for a quick access.
5. Click **Launch** to run the bot.  
After the bot run is successful, a **Completed** message is displayed. You cannot launch another bot until this activity completes.

## Using interactive forms

Interactive forms enable you to build forms for submitting and regrouping data that is used to send and receive information from various applications within your attended automation process.

Interactive forms provide a list of actions that you can drag into a bot as a task logic. Specific function of each action is displayed when you hover over them. The actions within the interactive forms can be broadly classified into the following types:

### Form level actions

Represented by  and used within a task logic to manage the linked form.

### Element level actions

Represented by  and used to manage elements of a form.

Watch the following video to understand how to use Interactive forms in Automation 360:

## Create a form

The form builder in Automation 360 enables you to create or edit forms using various form elements available through a browser interface. A form provides structural content with little or no changes in the layout. You can link a form to bots that perform predefined automated tasks.

The form builder requires no additional installation over the Bot agent. Control Room users with the Bot Creator license can access the form builder to design a new form or edit an existing form.

This task provides an example scenario where you create a new user registration form that captures all the necessary information. When you link this form to a bot, it can trigger a third-party application to store user information.

1. Click **BOTS > My Bots > Create new > Form**.
2. In the **Create form** page, enter a name for the new form.  
Forms are saved in the `\Bots\` folder by default. Click **Browse** to change the default folder.
3. Click **Create & edit**.  
The form builder page appears with a single row **Column** layout.

4. Use the **Properties** panel on the right to update or change the form properties.

- a) Enter the title in the **Form title** field.
- b) Use the **Formatting** fields to set the display font or the font size of the form elements.

---

**Note:** Use the **Font name** drop-down menu to select an English-only font.

If you have used any of the supported non-English languages for the form elements, select **Font name > System default**. For example, if you added an element label or text in Japanese, select **Font name > System default** for the form elements to be displayed in Japanese during the bot runtime.

---

- c) Use the **Dimensions** field to set the width and height of the form.
- d) Use the **Display behaviors** field to set the way the form is displayed on the user desktop.
- e) Optional: Use the **Logos in footer** field and select one of the following tabs:

- **One Logo**

Click **Select File** and use the **Search**, **Browse**, or **Upload** tabs to select an image file. The selected file is displayed in the footer of the form during bot runtime.

- **Two Logos**

Click the two separate **Select File** options to select two image files. The selected files are displayed in the footer of the form during bot runtime.

- f) Set a variable using **Hidden elements**.

For example, if the registration form is linked to a Social Security Number (SSN) that cannot be displayed to users, select the hidden element **Type** as **Number**. A user with a Bot Creator license can then access this variable when creating a bot.

5. Optional: Click **Preview**.

The form preview screen enables you to view the display resolution of the form and change the form position on the user's desktop. You can either enter the values for the **X** and **Y** coordinates or drag the form using the cursor to update the corresponding X and Y coordinates dynamically.

6. Optional: Drag **Column** to arrange elements horizontally.

For example, if you want the first name and last name fields to appear next to each other on the form, drag **Column** into the form. Then drag two text boxes into the columns. Use the row properties to customize the number of columns and the column width.

Click **Delete** or select any element and press the **Delete** button from the keyboard to remove it from the form.

7. In this scenario, drag the following elements into the form:
  - a) **Textbox**: Enter **First Name** in the **Element label** field of the first text box, and enter **Last Name** in the **Element label** field of the second text box.
  - b) **Number**: Enter **Contact Number** in the **Element label** field.  
For a new user registration form, some of the fields such as contact number might be mandatory. Use the **Advance behaviors** to make it mandatory and the **Formatting** option to set the input format.
  - c) **Radio Button**: Update the **Element label** as **Gender**. Change the values for the **Radiobutton1** as **Male** and **Radiobutton2** as **Female**.
  - d) **Date**: Enter **Date of Birth** in the **Element label** field.
  - e) **Textbox**: Enter **Email ID** in the **Element label** field.
  - f) **Dropdown**: Update the **Element label** as **Newsletter**. Enter **Daily, Weekly, Monthly**, or **None** in the **Add dropdown content** field.  
In this scenario, you can use the **Dropdown** element to create a newsletter option for the new user. This can be used to trigger an email based on the selected option.
  - g) **Button**: Enter **Submit** in the **Button-text (required)** field.
  - h) Drag another **Button** element and enter **Cancel** in the **Button-text (required)** field.  
Use the **Button type** drop-down menu and set this as **Secondary**.
8. Optional: Click **Preview**.  
Use this feature to preview the appearance of the form based on the resolution of the destination device.
9. Click **Save**.  
The new registration form is created and is ready to be linked to a bot.

## Using the Button element

Use the **Button** element in the form builder to validate or cancel a form during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Button** into the form.
4. Enter the name of the element in the **Button-text** field.
5. Optional: Enter the hint text and tooltip.
6. Use the **Button types** drop-down menu to set the type of the button element.  
For example, consider you have two buttons, Save and Cancel. Use **Primary** for Save and **Secondary** for Cancel. Or, if you want the button element to appear as a link during bot runtime, select **Subtle**.
7. Optional: Use the following **Advance behavior** option:
  - **Disallow button click when this form is first loaded**: Enable this option to disable the button element when the form is displayed for the first time during bot runtime.
  - **Validate all form fields when this button is clicked**: Enable this option to validate all available fields of the form when a user clicks this button element during bot runtime.

8. Optional: Click one of the following options:
  - **Reset:** Clears all the element customization and sets the default.
  - **Delete:** Deletes the selected element.
9. Click **Save**.

## Using the Checkbox element

Use the **Checkbox** element in the form builder to enable users to select multiple options in a form during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Checkbox** into the form.
4. Enter the name of the element in the **Element label** field.
5. Optional: Enter the hint text and tooltip for the check box element.
6. Use the **Checkbox content** fields to add multiple check boxes and enter a name for each one of them.  
For example, if you are creating a sales chart form, use this field to add three check boxes and enter `Product 1`, `Product 2`, and `Product 3`.
7. Optional: Enable any of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users select this element during bot runtime.
  - Select the **Make field uneditable** check box to make the element a read-only option.
  - If you have multiple check boxes in the form and want a default selection during bot runtime, select the **Make default selections** check box, and select the necessary option.
8. Use the **Formatting** field to set the vertical or horizontal layout of the check boxes.
9. Optional: Click one of the following options:
  - **Reset:** Clears all the element customization and sets the default.
  - **Delete:** Deletes the selected element.
10. Click **Save**.

## Using the Date element

Use the **Date** element in the form builder if the user must schedule a date in the form during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Date** into the form.
4. Enter the name of the element in the **Element label** field.
5. Select a default date using the **Default value** field.
6. Optional: Select the **Use the local system date when form is loaded** check box to set your system date as the default value.
7. Select one of the following formatting options:

- **Use locale date format setting:** The date is displayed in the format set on the user's machine.
  - **Manual input:** Select the date format to be displayed from the drop-down menu.
8. Enter the hint text and tooltip for the formatting option.
  9. Optional: Enable any of the following **Advance behavior** options:
    - Select the **Make field required** check box to ensure users select this element during bot runtime.
    - Select the **Make field uneditable** check box to make the element a read-only option.
  10. Optional: Click one of the following options:
    - **Reset:** Clears all the element customization and sets the default.
    - **Delete:** Deletes the selected element.
  11. Click **Save**.

## Using the Document element

Use the **Document** element in the form builder to render a document, such as an image (.jpg) or PDF, that you want to preview along with the form.

---

**Note:** Only one **Document** element can be used in a form.

---

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Document** into the form.
4. Enter the correct URL or the document location address in the **Default file** field.
5. Use the **Formatting** drop-down menu to set the position of the document element in the form.
6. Optional: Enter a specific width for the element in the **Dimensions** field.
7. Optional: Click one of the following options:
  - **Reset:** Clears all the element customization and sets the default.
  - **Delete:** Deletes the selected element.
8. Click **Save**.

## Using the Dropdown element

Use the **Dropdown** element in the form builder to provide multiple options in the form during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Dropdown** into the form.
4. Enter the name of the element in the **Element label** field.
5. Optional: Enter the hint text and tooltip for the check box element.
6. Use the **Add dropdown content** field to enter the items that must appear in the drop-down menu during bot runtime.
7. Optional: Enable any of the following **Advance behavior** options:

- Select the **Make field required** check box to ensure users select this element during bot runtime.
  - Select the **Make field uneditable** check box to make the element a read-only option.
  - If you have multiple items in the drop-down element and want a default selection during bot runtime, select the **Select default list item** check box, and select the necessary option.
8. Optional: Click one of the following options:
    - **Reset:** Clears all the element customization and sets the default.
    - **Delete:** Deletes the selected element.
  9. Click **Save**.

## Using the Dynamic Area element

Use the **Dynamic Area** element in the form builder to display content that is not part of the form itself during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Dynamic Area** into the form.
4. Enter the name of the element in the **Element label** field.
5. Use the **Placeholder text** field to enter the text that must appear if this element is empty during bot runtime.
6. Enter a specific height of the element in the **Height** field.  
The default dimension value is set to 120 and enables a scroll bar if the additional content exceeds this value.
7. Optional: Click one of the following options:
  - **Reset:** Clears all the element customization and sets the default.
  - **Delete:** Deletes the selected element.
8. Click **Save**.  
The **Dynamic Area** action is available during bot runtime to render this field.  
See [Interactive forms package](#).

## Using the Select File element

Use the **Select File** element in the form builder to enable users to attach a file to the form. For example, if the registration form requires a new user to attach a photograph, you can use this element in the form.

1. Click **BOTS > My Bots**.  
A list of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Select File** into the form.
4. Enter the name of the element in the **Element label** field.
5. Optional: Enter the hint text and tooltip for the element.
6. Use the **Acceptable file format** field to add all the supported file formats.  
For example, if you want to allow users to only upload image files, enter `png`, `jpeg`, and `jpg`.
7. Optional: Choose one of the following **Advance behavior** options:

- Select the **Make field required** check box to ensure users must select this element during bot runtime.
  - Select the **Make field uneditable** check box to set the element as a read-only option.
- 8.** Optional: Choose one of the following options:
- **Reset:** Clears all the element customization and sets the default.
  - **Delete:** Deletes the selected element.
- 9.** Click **Save**.
- When you click **Preview** during bot runtime, the system default application is used to display the selected file.
- For example, if Microsoft Excel is set as the default application and you use **Select file** to upload a `.xls` spreadsheet, the selected document is displayed in Microsoft Excel when you click **Preview** during bot runtime.
- Users can click **Browse** to select a file or drag a file into the **Select File** element during bot runtime.

## Using the Select Folder element

Use the **Select Folder** element in the form builder to enable users to upload a folder that contains a specified file type during bot runtime.

- 1.** Click **BOTS > My Bots**.  
The list of available forms and bots is displayed.
- 2.** Click an existing form or click **Create new > Form**.  
The form builder page appears.
- 3.** Drag **Select Folder** into the form.
- 4.** Enter the name of the element in the **Element label** field.
- 5.** Optional: Select the **Show list of supported files in the folder** check box.  
If you select this option, the supported file types are displayed below the **Select folder** form element during bot runtime.
- 6.** Enter the supported file types for this element during bot runtime.  
For example, if you want to allow users to only upload folders that contain documents or text files, enter `doc` and `txt`.
- 7.** Optional: Enter the hint text and tooltip for the element.
- 8.** Optional: Choose one of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users must select this element during bot runtime.
  - Select the **Make field uneditable** check box to set the element as a read-only option.
- 9.** Click **Save**.  
Users can click **Browse** to select a folder or drag one into the **Select Folder** element during bot runtime.

## Using the Hyperlink element

Use the **Hyperlink** element in the form builder if you want to assign a URL during bot runtime.

- 1.** Click **BOTS > My Bots**.  
The list of available forms and bots is displayed.
- 2.** Click an existing form or click **Create new > Form**.  
The form builder page appears.

3. Drag **Hyperlink** into the form.
4. Enter the text to be displayed for the URL in the **Display text** field.
5. Enter the link in the **URL** field.
6. Use the **Open in browser** drop-down menu to select a browser to open the URL. If you select Google Chrome, the URL opens in Google Chrome during bot runtime.
7. Optional: Enter the hint text and tooltip for the check box element.
8. Click **Save**.

## Using the Image element

Use the **Image** element in the form builder to enable users to attach an image file to the form. For example, you can use this element to add a company logo to the form during bot runtime.

1. Click **BOTS > My Bots**.  
A list of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Image** into the form.
4. Enter the name of the element in the **Element label** field.
5. Optional: Enter a custom value for the height of the image.
6. Optional: Enter hint text and tooltip for the element.
7. Use the **Desktop or network path to retrieve image** field to specify the image filepath.
8. Click **Save**.

## Using the Label element

Use the **Label** element in the form builder to add a read-only field in the form during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Label** into the form.
4. Enter the name of the element in the **Element label** field.
5. Enter a tooltip that appears when the user points to the element.
6. Optional: Click one of the following options:
  - **Reset**: Clears all the element customization and sets the default.
  - **Delete**: Deletes the selected element.
7. Click **Save**.

## Using the Number element

Use the **Number** element in the form builder if the form must have a field that allows the user to enter only numeric values during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.

3. Drag **Number** into the form.
4. Enter the name of the element in the **Element label** field.
5. Set the default value for the element.
6. Enter the minimum and maximum number of characters that users can enter in this field during bot runtime.
7. Optional: Enter the hint text and tooltip for the check box element.
8. Optional: Enable any of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users select this element during bot runtime.
  - Select the **Make field uneditable** check box to make the element a read-only option.
9. Use the **Formatting** options to enable users to enter negative values, trailing zeroes, and comma during bot runtime.
10. Use the **Decimals** drop-down menu to set the number of decimal places.
11. Use the **Special characters** field to enter the prefix and suffix labels for the element.
12. Optional: Click one of the following options:
  - **Reset**: Clears all the element customization and sets the default.
  - **Delete**: Deletes the selected element.
13. Click **Save**.

## Using the Password element

Use the **Password** element in the form builder if the form must have a confidential or masked field. This element uses the masking feature by default and Credential Vault encryption to transfer data during bot runtime.

1. Click **BOTS > My Bots**.  
The list of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Password** to the form.
4. Enter the name of the element in the **Element label** field.
5. Use the **Formatting** field for additional options:
  - **Standard**
    - Set the character limit for password using the **Min** and **Max** fields.
    - Enable additional security options for the password.
  - **Custom**
    - Click the **Add regular expression** option and enter a custom password in the **Regular expression** field.
    - **Optional**: Enter the same custom password in the **Test Content** field, and click **Test regular expression** to verify it works correctly.
6. Optional: Enter the hint text and tooltip.
7. Optional: Enable any of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users select this element during bot runtime.
  - Select the **Make field uneditable** check box to make the element a read-only option.
8. Optional: Click one of the following options:

- **Reset:** Clears all the element customization and sets the default.
- **Delete:** Deletes the selected element.

9. Click **Save**.

---

**Note:** Use the view icon in the **Password** field to review the password during bot runtime.

---

## Using the Radio Button element

Use the **Radio Button** element in the form builder if you want to enable users to select only one of the available options from a field during bot runtime.

1. Click **BOTS > My Bots**.

List of available forms and bots is displayed.

2. Click an existing form or click **Create new > Form**.

The form builder page appears.

3. Drag **Radio Button** into the form.

4. Enter the name of the element in the **Element label** field.

5. Optional: Enter the hint text and tooltip for the check box element.

6. Enter the names of the radio buttons that will be displayed during bot runtime.

For example, if you are creating a client information form, use this field to add two radio buttons and enter `Male` and `Female`.

7. Enable any of the following **Advance behavior** options:

- Select the **Make field required** check box to ensure users select this element during bot runtime.
- Select the **Make field uneditable** check box to make the element a read-only option.
- If you have multiple radio buttons in the form and want a default selection during bot runtime, select the **Make default selections** check box, and select the necessary option.

8. Use the **Formatting** field to set the vertical or horizontal layout of the radio buttons.

9. Optional: Click one of the following options:

- **Reset:** Clears all the element customization and sets the default.
- **Delete:** Deletes the selected element.

10. Click **Save**.

## Using the Rich Text Editor element

Use the **Rich Text Editor** element in the form builder to insert a text editor in the form that provides various options to edit the content during bot runtime.

1. Click **BOTS > My Bots**.

List of available forms and bots is displayed.

2. Click an existing form or click **Create new > Form**.

The form builder page appears.

3. Drag **Rich Text Editor** into the form.

4. Enter the name of the element in the **Element label** field.

5. Set the default value for the element that must appear in the element during bot runtime.

6. Enter the minimum and maximum number of characters that users can enter in this field during bot runtime.

7. Optional: Enter the height for the input area of the field and tooltip for the element.
8. Optional: Enable any of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users select this element during bot runtime.
  - Select the **Make field uneditable** check box to make the element a read-only option.
9. Optional: Click one of the following options:
  - **Reset**: Clears all the element customization and sets the default.
  - **Delete**: Deletes the selected element.
10. Click **Save**.

## Using the Snapshot element

Use the **Snapshot** element in the form builder to provide the users a screen capture option on the form during bot runtime. The file is saved in the `.jpg` format.

1. Click **BOTS > My Bots**.  
A list of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Snapshot** into the form.
4. Enter the name of the element in the **Element label** field.
5. Optional: Enter the hint text and tooltip for the check box element.
6. Optional: Choose one of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users must select this element during bot runtime.
  - Select the **Make field uneditable** check box to set the element as a read-only option.
7. Enter a filepath in the **Desktop path to save snapshot** field where the snapshot file must be saved during bot runtime.  
Optionally, you can either allow the user to create a folder if the filepath is not available or change the destination folder of the snapshot file.
8. Enter the suffix text for the snapshot file.  
For example, if this element is used to capture sales information, enter `Sales`. The snapshot file is then saved with the text `Sales` added at the end.
9. Optional: Choose one of the following options:
  - **Reset**: Clears all the element customization and sets the default.
  - **Delete**: Deletes the selected element.
10. Click **Save**.  
When you click **Preview** during bot runtime, the system default application is used to display the snapshot file.  
For example, if Microsoft Photos is set as the default application to open `.jpg` files, the snapshot file is displayed in Microsoft Photos when you click **Preview**.

## Using the Table element

Use the **Table** element in the form builder to insert a customizable table in the form that can be used to populate data during bot runtime.

1. Click **BOTS > My Bots**.

A list of available forms and bots is displayed.

2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Table** to the form.
4. Enter the name of the element in the **Element label** field.
5. Optional: Enter hint text for the element.  
For example, enter `View outpatients details` if the table is used to capture a list of outpatients.
6. Use the **Rows before scrolling** field to enter the minimum number of rows the table element must have before a scroll bar is added during bot runtime.
7. Add or remove the total number of columns.
8. Click **Column settings** for additional options.
9. In the **Column settings** page, click the **Form element type** drop-down menu to set the element type.  
For example, if you select **Dropdown**, use the **Add dropdown content** field to enter the items that must appear in the drop-down menu during bot runtime.
10. Optional: Click **Make columns width equal**.
11. Optional: Enable **Advance behavior** option:
  - Select **Make table uneditable** check box to enable a read-only view during bot runtime.
  - Select **Include table actions** check box to enable users to add, remove or edit the table rows during bot runtime.

If you use the table actions to delete all the rows from a table and then add a new row, the columns and rows of the table appear misaligned. Drag and resize any column to reset the alignment.
12. Optional: Click one of the following options:
  - **Reset**: Clears all the element customization and sets the default.
  - **Delete**: Deletes the selected element.
13. Click **Save**.

## Using the Text Area element

Use the **Text Area** element in the form builder to insert a text field in the form for users to enter alphanumeric characters during bot runtime.

1. Click **BOTS > My Bots**.  
List of available forms and bots is displayed.
2. Click an existing form or click **Create new > Form**.  
The form builder page appears.
3. Drag **Text Area** into the form.
4. Enter the name of the element in the **Element label** field.
5. Use the **Default value** field to enter the default text to be displayed in the element.
6. Enter the minimum and maximum number of characters that users can enter in this field during bot runtime.
7. Enter the height for the input area of the field.
8. Optional: Enter the hint text and tooltip for the check box element.
9. Optional: Enable any of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users select this element during bot runtime.

- Select the **Make field uneditable** check box to make the element a read-only option.

**10.** Optional: Click one of the following options:

- **Reset:** Clears all the element customization and sets the default.
- **Delete:** Deletes the selected element.

**11.** Click **Save**.

## Using the Text Box element

Use the **Text Box** element in the form builder to insert a text box in the form.

**1.** Click **BOTS > My Bots**.

The list of available forms and bots is displayed.

**2.** Click an existing form or click **Create new > Form**.

The form builder page appears.

**3.** Drag **Text Box** into the form.

**4.** Enter the name of the element in the **Element label** field.

**5.** Enter the default text that must appear in the element.

For example, if this field is used in a registration form, enter `First name`, which is displayed during bot runtime.

**6.** Use the **Formatting** field for additional options:

- **Standard**

Set the character limit using the **Min** and **Max** fields.

- **Custom**

- Click the **Add regular expression** option and enter a custom text in the **Regular expression** field.

- **Optional:** Enter the same custom text in the **Test Content** field, and click **Test regular expression** to verify it works correctly.

**7.** Optional: Enter the hint text and tooltip for the element.

**8.** Enable any of the following **Advance behavior** options:

- Select the **Make field required** check box to ensure users select this element during bot runtime.
- Select the **Make field uneditable** check box to make the element a read-only option.
- Select the **Mask data** check box if you want the field to be masked by special characters when the user enters data during bot runtime.

**9.** Optional: Click one of the following options:

- **Reset:** Clears all the element customization and sets the default.
- **Delete:** Deletes the selected element.

**10.** Click **Save**.

## Using the Time element

Use the **Time** element in the form builder to set the time in the form during bot runtime.

**1.** Click **BOTS > My Bots**.

The list of available forms and bots is displayed.

**2.** Click an existing form or click **Create new > Form**.

The form builder page appears.

3. Drag **Time** into the form.
4. Enter the name of the element in the **Element label** field.
5. Select a default time using the **Default value** field.
6. Optional: Select the **Use the local system time when form is first displayed** check box to set your system time as the default value.
7. Use one of the following formatting options:
  - Set the time to **12 Hours** or **24 Hours** format.
  - Enter the hint text and tooltip.
8. Optional: Enable any of the following **Advance behavior** options:
  - Select the **Make field required** check box to ensure users select this element during bot runtime.
  - Select the **Make field uneditable** check box to make the element a read-only option.
9. Optional: Click one of the following options:
  - **Reset**: Clears all the element customization and sets the default.
  - **Delete**: Deletes the selected element.
10. Click **Save**.

## Add a form to bot

Adding an existing form to a bot enables users to collaborate with bots. Use the necessary action items to create a bot and build a task logic.

This task describes a scenario where you want to design a bot that triggers an existing New User Registration form. A **Hot key** preset trigger starts the bot. An existing form that is linked to the bot is displayed where the user enters the information.

- If the user clicks **Submit**, a User Agreement form is displayed.
- If the user clicks **Cancel**, `User registration is canceled` message is displayed and the bot is terminated.

1. Click **BOTS > My Bots > Create new > Bot**.
2. Enter a name for the bot.  
All the bots are stored in the `\Bots` folder. Click **Browse** to change the folder.
3. Click **Create & edit**.  
The bot builder pane is displayed that has **Flow** (default view), **List** and **Dual** view. You can drag the required actions from the left pane to create a task.
4. In **Triggers > Hot key**, drag **Hot key trigger** into **Drag a trigger here** in the bot logic.
5. Set **Ctrl** and **L** as the hot key combination.
6. Use the **Search actions** field to find **Interactive forms**.
7. Drag **Display** into the task logic.  
You can use the display action to show the form when the bot is triggered. The display action properties appear on the right.

8. Click the create variable icon (  ) to create a variable.

You have to create a form variable by linking an existing form. This enables you to use the form variable and the associated form across multiple instances.

---

**Note:** The form variable can be linked only to forms created using the Control Room form builder.

---

9. On the **Create variable** screen, enter a name for the form variable you are creating.
10. Click **Browse** and select the New User Registration form.  
This links the New User Registration form to the form variable that you are creating.
11. Click **Create & select**.  
A new form variable is created. For any existing form variable, use the **Form name** drop-down menu to select it.
12. Use the **Search actions** field to find **Trigger loop** and drag it to add event monitoring.  
Event monitoring enables you to simultaneously set multiple events within the task logic of a bot.
13. Drag **Handle** into the **Trigger loop**.  
Handle enables you to run an action by configuring a trigger in the **Trigger loop: Handle** for the bot. You can set a trigger when a event occurs on the selected interface (selected application) or when a user clicks the selected form element.
14. For this scenario, use the **Trigger on** drop-down menu to select **INTERACTIVE FORMS > Form trigger**.
15. Click the **Form name** drop-down menu and select the New User Registration form.  
This enables you to set a trigger for the **Submit** option of the New User Registration form.
16. Click the **Form element** drop-down menu and select **Submit**.  
For the **Button** element of a form, the **Select action trigger** is set to **Clicked** by default. When the user clicks **Submit** on the New User Registration form, it triggers the User Agreement form.
17. Search for **Interactive forms** and drag **Display** into **Trigger loop: Handle**.
18. Click the **Form name** drop-down menu and select User Agreement form.  
The User Agreement form appears.
19. Search for **Message** and drag it into **Trigger loop: Handle**, after **Interactive forms**.  
A successful registration message appears when the user clicks **Submit**.
20. Terminate the trigger by dragging **Break** into the **Trigger loop**.  
Use **Break** to exit the current event loop and for actions where finishing a process is required.
21. Drag another **Handle** next to the **Trigger loop: Handle**.  
This enables you to set a trigger for the **Cancel** option of the New User Registration form.
22. Click the **Form element** drop-down menu and select **Cancel**.
23. Search for **Message** and drag it into **Trigger loop: Handle**. Update the **Enter the message to display** field as User registration is canceled.  
When the user clicks **Cancel** on the New User Registration form, it triggers a `User registration is canceled` message and terminates the bot.
24. Drag **Trigger Loop > Break** to terminate the loop.
25. Click **Save**.
26. Click **Run with triggers**.  
The **Run with triggers** sets the **Hot key** trigger to start the bot, which is Ctrl plus L combination from the keyboard in this scenario.

## Related reference

[Interactive forms package](#)

The interactive forms package contains actions that handle exceptions encountered by a bot. All the actions performed by users on the interactive forms can be monitored to execute logic using subtasks.

## Adding a trigger to run a bot

Add triggers that can automatically run the selected bot whenever a specific event occurs. For example, clicking a specific button or using a combination of keystrokes.

Triggers integrate predefined events into your workflow and reduce the number of repetitive tasks that users must perform. Attended automation in Automation 360 enables you to create unique triggers for various applications. You can then use these triggers to start a bot.

Use one of the following types of triggers to start a bot:

### Email

Starts a bot when a new email message is received in the specified email service such as Microsoft Outlook, Email server, or EWS server.

### Files and folders

Starts a bot when a predefined file or folder event occurs. You can set one of the following options as the trigger:

- When a new file or folder is created.
- When an existing file or folder is deleted.
- When a file or folder is renamed.
- When a file or folder is modified.

### Hot key

Starts a bot when a predefined combination of keystroke is performed on the keyboard. You can set a combination of the following keys as the trigger:

- Control keys such as Ctrl, Alt, Windows logo key, and Esc.
- Keys with regular alphabetical (English) characters.

### Interface

Starts a bot when a predefined event occurs on the selected user interface element. Some examples of the predefined events are:

- User clicks a button.
- User opens or closes an application.
- User selects or clears a checkbox.

---

**Note:** When capturing an interface trigger in a SAP application, ensure that both the Recorder and Interface trigger packages are from Build 5933 or from a prior release.

---

### Related reference

[Trigger loop package](#)

The **Trigger loop** package enables you to run a series of actions when a trigger event occurs. You can insert multiple trigger loops within a bot or nest one trigger loop within another trigger loop.

## Add an email trigger

Use email triggers to start a bot when a new email message is received in a specified email service.

Connect the Control Room to one of the email services on your system and trigger the bot when you receive a new email.

1. Click **BOTS > My Bots > Create new > Bot**.
2. Enter a name for the bot.  
All the bots are stored under the `\Bots` folder. Click **Browse** to change the folder.
3. Click **Create & edit**.
4. In the bot builder page, click **Triggers > Email trigger**.
5. Drag **Email** into **Drag a trigger here**.
6. Use the **Email trigger** pane on the right to choose one of the following server types as the trigger for your incoming emails:

Server type	Steps
<b>Microsoft Outlook</b>	<p>Click <b>Outlook</b>.</p> <p>Microsoft Outlook is set as the email service and the bot is triggered when you receive a new email.</p>
<b>Email server</b>	<p>Click <b>Email server</b>.</p> <p><b>a.</b> Enter the email service <b>Host</b> information. For example, if you are using Office365 as your email service, enter <code>Outlook.office365.com</code>.</p> <p><b>b.</b> Select <b>IMAP</b> or <b>POP3</b>. IMAP and POP3 are protocols used to connect to the mail server that enables you to read your emails through an email client.</p> <hr/> <p><b>Note:</b> The POP3 protocol has a known limitation where any new calendar invite can also trigger the bot.</p> <hr/> <p><b>c.</b> Enter the configured port number for your email server.</p> <p><b>d.</b> Select one of the following user authentication methods to sign in to the email server:</p> <ul style="list-style-type: none"> <li>• <b>Credential:</b> Click <b>Pick</b> to select the stored <b>Username</b> and <b>Password</b>. <i>Credentials and credential variables in the Bot editor</i></li> <li>• <b>Insecure string:</b> Enter the username and password.</li> </ul> <hr/> <p><b>Note:</b> The <b>Email in folder</b> does not support sub-folders when you set the protocol as <b>POP3</b> for <b>Email Server</b>,</p> <hr/>

Server type	Steps
<b>EWS server</b>	<p>Click <b>EWS server</b>.</p> <ol style="list-style-type: none"> <li><b>a.</b> From the <b>Microsoft Exchange Version</b> drop-down menu, select your current version. For example, if you are using Microsoft Exchange Service Pack 2, select <b>Exchange2010_SP2</b> as your email service.</li> <li><b>b.</b> Select one of the following user authentication methods to sign in to the email server: <ul style="list-style-type: none"> <li>• <b>Credential:</b> Click <b>Pick</b> to select the stored <b>Username</b> and <b>Password</b>. <i><a href="#">Credentials and credential variables in the Bot editor</a></i></li> <li>• <b>Insecure string:</b> Enter the username and password.</li> </ul> </li> </ol>

7. Optional: Use the **Check every** drop-down menu available under all the server types to set the trigger interval.

The trigger interval for the bot is set to 120 seconds by default.

8. Optional: Use **Select Conditions** to specify an email event for the selected server type. Consider a scenario where you select **Outlook** and want to trigger a bot when you receive an email from a specific sender. In **Select Conditions**, select the **Email from** check box and specify the sender's email address.

9. Optional: In the **Assigned to > Record** tab, click  to create a variable.

You can use this variable to fetch various details about the email that triggered the bot such as sender, recipient, subject, email content, date, action information, email server host and port data.

10. Click **Apply**.

11. Click **Run > Run with triggers**.

Microsoft Outlook, Email server or EWS server is set as the trigger to start the bot for new emails.

## Add a file and folder trigger

Use the files and folders trigger to start a bot when a predefined action such as create, delete, rename, or modify is performed on a file or a folder.

This procedure is for a scenario where you want to trigger a bot when a user modifies a spreadsheet called `Sales update.xls`.

---

**Note:** This scenario is for a user with Bot Creator role.

For information about how a user with a Bot Runner role can link event triggers, see [Linking event triggers to a Bot Runner](#).

---

1. Click **BOTS > My Bots > Create new > Bot**.
2. Enter a name for the bot.  
All the bots are stored under the `\Bots` folder. Click **Browse** to change the folder.
3. Click **Create & edit**.
4. In the bot builder page, click **Triggers > Files & folders**.
5. Drag **File trigger** into **Drag a trigger here**.

6. Click **Browse** and select the `Sales update.xls` file.
7. From the **Start the bot when the file is** drop-down menu, select **modified**.  
This sets the trigger for the bot.
8. Optional: Use the **Assigned to** drop-down menu to assign a variable.  
If you want use the **Variables** tab to create a variable, ensure you select the **Use as input** check box for it to appear in the **Assigned to (optional)** drop-down menu.

---

**Note:** If you use the `%i` in the **Assigned to (optional)** drop-down menu to create a variable, ensure that you do not select the **Constant (read only)** check box.

---

The following set of data can be retrieved by defining a variable as the input type, which you can assign to get output from the trigger:

- **triggerType:** File or folder trigger
- **eventType:** The type of trigger event

The following set of data cannot be used if the **Set Schema** check box is selected as it returns a non-string variable type:

- **timeStamp:** The time when the trigger occurred

Ensure you link the **timeStamp** value to a string variable to obtain the trigger data. For example, consider you want to extract the date and time for the trigger event when a user modifies the `Sales update.xls` file. Use the **Message** action within the task logic, and enter `Date Time-$recordVar[2]$` in the **Enter the message to display** field.

- **fromFolder:** Details of the parent folder path
- **folder:** Details of the file or folder path on which the event occurred

9. Click **Save**.
10. Click **Run > Run with triggers**.  
Whenever a user modifies the `Sales update.xls`, the bot is triggered.

## Related reference

### [About event triggers](#)

An event trigger is a predefined action that runs an associated bot. All the bots with event triggers are listed under the **Event triggers** tab.

## Add a hot key trigger

Use the hot key trigger to start a bot when a predefined combination of keys is used on the keyboard.

This procedure is for a scenario where the bot triggered when a user presses Ctrl (plus) L keys from the keyboard.

1. Click **BOTS > My Bots > Create new > Bot**.
2. Enter a name for the bot.  
All the bots are stored under the `\Bots` folder. Click **Browse** to change the folder.
3. Click **Create & edit**.
4. In the bot builder page, click **Triggers > Hot key**.
5. Drag **Hot key trigger** into **Drag a trigger here**.
6. Click **Ctrl** to set it as the **Hot key** from the available key modifiers.
7. Use the drop-down menu to select **L** from the keyboard.  
The **Hot key** field displays the key combination that will trigger the bot.
8. Click **Apply**.

**9. Click Run > Run with triggers.**

When the Ctrl and L keys are used on the keyboard, the bot is triggered.

## Add an interface trigger

Use interface triggers to start a bot when a predefined action occurs on a specific interface element, such as clicking a button or closing an application.

This procedure is for a scenario where you want to configure a trigger to start a bot when the user clicks **New** option in Microsoft Word. Ensure you have the Microsoft Word application open on your system.

---

**Note:** Interface triggers for objects are available only for native Windows applications.

---

**1. Click BOTS > My Bots > Create new > Bot.****2. Enter a name for the bot.**

All the bots are stored in the `\Bots` folder. Click **Browse** to change the folder.

**3. Click Create & edit.****4. In the bot builder page, click Triggers > Interface trigger.****5. Drag Object into Drag a trigger here.**

The **Interface trigger: Object** editing panel appears.

**6. In Window detail tab, click Application.****7. Click the drop-down menu and select Taskbar under Preset.**

If Microsoft Word is not displayed in the list, you can use the Refresh option to reload the list of applications.

**8. Click Capture object.**

This initiates a built-in web recorder that captures the action. In this scenario, Microsoft Word is displayed. Click **New**, which is then set as the trigger to start the bot.

**9. Click the Select main event drop-down menu to choose a specific event.**

In this scenario, **New** in Microsoft Word is considered a button and the following events are available:

- **Click:** Triggers the bot when the user clicks the selected main event object.
- **Click with hotkey:** Use one of the available key modifiers and select a key (alphabetical letters) from the drop-down menu. This combination is set as the hot key to trigger the bot.

**10. Optional:** Select one of the available Control keys (Shift, Alt, Ctrl, Windows and AltGr) as an additional combination for the hot key to trigger the bot.**11. Click Save.****12. Click Run > Run with triggers.**

The preset trigger is created, and the bot is triggered when the user clicks **New** in Microsoft Word.

## Example for using hot key to trigger a bot

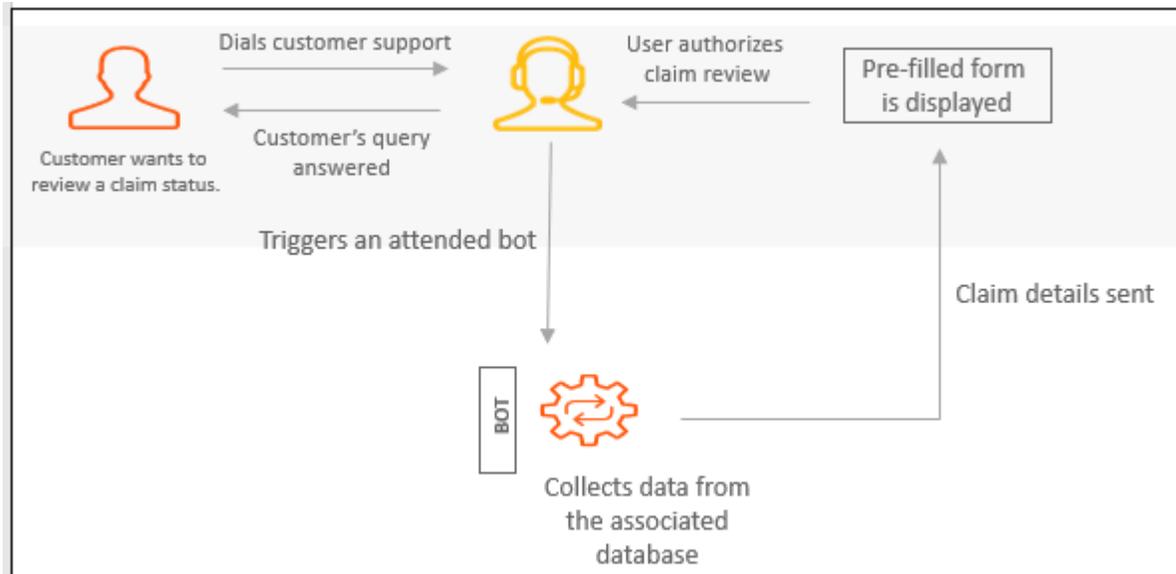
In this example, a front desk executive of an insurance company responds to a call from an existing customer who wants to understand the policy details and its validity. The executive uses a hot key to trigger a bot that retrieves the customer's information.

Information about all the existing customers and the insurance company's various policies is distributed across two different databases. An existing bot maps the data between the two databases and provides

consolidated information in a user readable format to the executive. **Ctrl+L** is set as the hot key to trigger this bot.

1. The executive collects caller's information to verify if it is an existing customer.  
The executive confirms the caller is an existing customer who wants to know the policy details.
2. The executive uses **Ctrl+L** to trigger a bot.  
The bot retrieves the customer information and the corresponding policy details. An authorization message is displayed.
3. The executive reviews the information that is consolidated in a form, and answers the customer queries without any delay or hold time.

The following image illustrates this attended automation scenario:



## Process Discovery using Discovery Bot

Use Discovery Bot to capture document processes, identify automation opportunities from business processes, prioritize opportunities based on ROI, and create bots automatically.

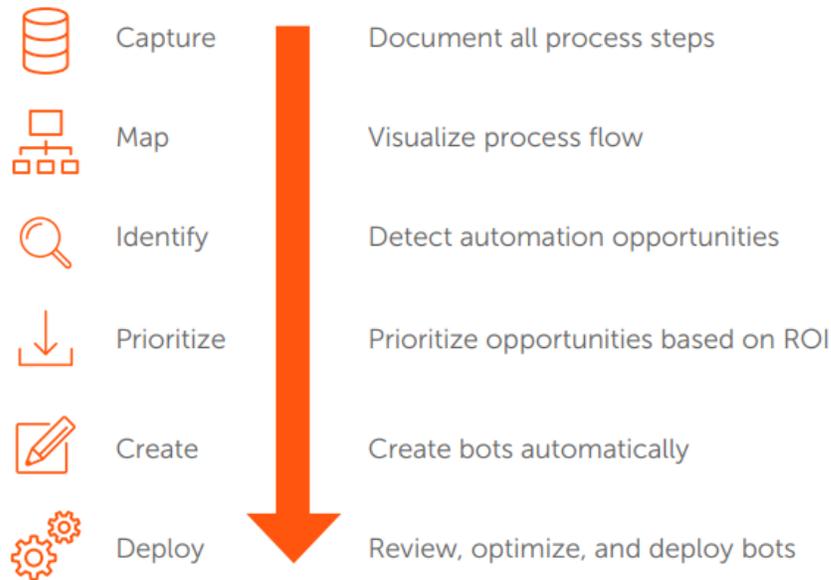
Intelligent automation begins with discovering and identifying patterns in business processes before RPA can begin. Process discovery solutions such as Discovery Bot align business workers to uncover automation opportunities that can optimize the return on your RPA investment.

### Who uses Discovery Bot

Business specialists can use Discovery Bot to capture and annotate the steps they perform for a business process. The business analyst collects, visualizes, and analyzes the documented business processes to identify potential opportunities to convert to an automated process.

### How Discovery Bot works

Discovery Bot enables users to record and document the steps of a business process, use visualizations and statistical data to identify automation opportunities, manage those opportunities, and convert them into automated business processes .



### *Get started with Discovery Bot*

Watch the following video on how to get started with Discovery Bot:

<https://www.youtube.com/embed/wxp8xi4zn14>

## Get started with Discovery Bot

Discovery Bot enables organizations to accelerate the automation of business processes from process discovery to bot creation.

- Ensure the system requirements are met.

### *Prerequisites for Discovery Bot*

- Install and configure Discovery Bot for users in your organization.

### *Installing Control Room On-Premises*

1. Set up users and assign Discovery Bot roles.

Assign Automation 360 users with the relevant Discovery Bot permissions and associated licenses.

- *Discovery Bot users*
- *Supported licenses for Discovery Bot*
- *Create users for Discovery Bot*
  - *Create multi-role users for Discovery Bot*
  - *Create a custom role for Discovery Bot*
  - *Assign the Discovery Bot custom role to a user*

2. Set up the business process within your organization.

Create a placeholder for collecting all of the recordings associated for a given process. Invite one or more users through email notification to a Discovery Bot process recording session.

### *Create a Discovery Bot process*

**3. Record the process.**

Business users record their work for the associated processes, annotate their steps, and submit for review for possible opportunities for automation. .

- *Supported applications and browsers for Discovery Bot*
- *Record a Discovery Bot business process*

**4. Analyze the process.**

The relevant business users (subject matter experts (SMEs), RPM or business analysts (BA)) review the recordings for specific usage patterns.

- *Analyzing processes for automation*
- *Review and compare recording data*

**5. Create opportunities. Merge specific recordings or steps as required.**

*Create a process view with branches and opportunities*

**6. Prioritize opportunities and generate bots automatically.**

*Review opportunities and convert to bot*

## Discovery Bot users

Various users are involved in the Discovery process, and each user's role and responsibility helps in identifying potential automation opportunities. The streamlined workflow in Discovery Bot enables various users to collaborate without changing their operations in a major way.

Discovering opportunities for automation involves the following users:

**Control Room administrator**

Responsible for creating users and assigning roles and licenses for Discovery Bot.

**Discovery Bot administrator**

Manages the creation, deletion, and editing of processes, and the associating or disassociating of Discovery Bot users roles to one or more processes.

Users with the Discovery Bot admin privileges cannot view the recording data of any process, participate in the recording analysis, or create new opportunities.

**Discovery Bot analyst**

These users can also be known by other names in an organization such as process owner, process analyst, business analyst, or subject matter expert. The Discovery Bot analyst is responsible for reviewing the associated recordings and identifying potential candidates for automation. The analyst can do the following:

- View all approved recordings from assigned users for a given process.

The analyst cannot edit the recordings; however, they can merge the necessary variations from multiple recordings and create an aggregate view of the process.

- Create one or more opportunities from individual recordings and the aggregated view created

from multiple recordings, and convert the opportunities into bots.

- Export an opportunity to a Word document.

While it is not a prerequisite for the analyst to have inherent knowledge of processes that are being reviewed, it is beneficial because this knowledge helps in easily selecting and analyzing the recordings.

### Discovery Bot business user

Represents the task force in an organization that will benefit from process automations. The business user performs the associated tasks within one or more business processes.

- Capture one or more recordings of performing the assigned processes.

The user is responsible for recording the steps in the process that are being reviewed and evaluated for potential automation candidates.

- The user is invited to participate in one or more processes by the Discovery Bot administrator.
- Edit and annotate the recordings.

For each recording, the user can review the recorded screen captures and provide annotations to capture the business context for the analyst to review. The user can update the keyboard entered text field if the information should not be shared with the analyst (e.g. user ID and password). If the captured steps are not relevant to the process, the business user can delete the steps before submitting for review.

---

**Note:** After the recording has been submitted, it cannot be edited for making any further changes.

---

- Control the steps being recorder.

Users can start, pause, resume, and stop the recording on demand using the Discovery Bot recorder to capture the relevant steps for each process.

---

**Note:** After the recorder has been stopped, additional steps cannot be inserted into that recording.

---

## Prerequisites for Discovery Bot

To use Discovery Bot for your enterprise business processes, you must have an Automation 360 working environment and the associated dependencies installed: Bot agent, browser extension, and so on.

### Supported versions and server requirements

Verify that you have the correct Control Room version installed. The Control Room deployment can be cloud or on-premises.

Ensure your Control Room server requirements are set up before installation.

---

**Note:** The minimum RAM required to support Discovery Bot functionality on your local machine is 4 GB.

---

See [Control Room server requirements](#).

### System requirements

For Discovery Bot users' recording processes or assigned bot creation privileges, verify that your device meets the following system requirements:

- Windows machine is only supported for recording sessions.
- Set your local device credentials for any device that is connected to the Control Room. This is a one-time setup for each device. Ensure each device that you use accepts the credentials in your profile.
- [Set user device credentials](#)
- Register your device and install the latest Bot agent version on your machine.

[Install Bot agent and register device](#)

- To record processes using Google Chrome, the Chrome plug-in must be installed.

[Browser requirements](#)

- Ensure your environment is ready to begin recording and analyzing processes using the Discovery Bot recorder. The prerequisites are similar to the Universal Recorder.

[Record a task with the Universal Recorder](#)

- Verify the Discovery Bot recorder requirements are completed.

[Supported applications and browsers for Discovery Bot](#)

### Update proxy settings

You must update your proxy settings to add the Automation Anywhere URL domain to the trusted list. The added URL domain is specific to your region of Automation Anywhere cloud. If you are using your proxy to access our cloud, you must avoid a redirect to your proxy. Remove any authentication type settings and policy acceptance.

### Installation requirements

The Discovery Bot installer is integrated with the Automation 360 installer. No separate installation is required for Discovery Bot On-Premises users. The IT administrator in your organization performs this task. See [Installing Control Room On-Premises](#).

---

**Note:** Ensure your database server requirements are met before using SQL authentication mode to connect to the Control Room: [Installing Control Room using Custom mode](#).

---

For custom installation, you can now change the default repository path location to a new location on your server after installation. The default path is: `C:\ProgramData\AutomationAnywhere\ServerFiles`. The Process Discovery files now reside in the ServerFiles folder.

---

**Note:** For Control Room admin. You must manually copy and paste the existing data into the new location if you change the default path to the new location.

---

The generated PDD file for an opportunity is now stored locally on your server by Automation 360 On-Premises. The path to the file storage is: `C:\ProgramData\AutomationAnywhere\ServerFiles\ProcessDiscovery\opportunity`. The existing PDD files will automatically be moved to the new location and will not be deleted when a reinstall or upgrade occurs in the Control Room.

## Verify installation

After the installation is complete, log in to your Control Room as an administrator. The Discovery Bot tab is available for use from the left panel.

## Process Discovery package

The Process Discovery package contains actions that record various object operations such as click (right or left), recording, and window resizing that are used during process recording sessions. View information about the Process Discovery package from the **View package** page (**Bots > Packages > Process Discovery**).

The package is included in the default packages. You can preload the default package when you connect to your device. Preloading the package helps to speed the start time of the recorder the first time you begin recording a process.

The actions in the package are not available for use from the Bot editor.

### Related tasks

#### [Preload packages](#)

You can preload packages on your local device to shorten the bot runtime.

## Upgrade Discovery Bot from Enterprise A2019.15 to later versions

Upgrade Discovery Bot from Enterprise A2019.15 (On-Premises) to a later version for the latest features and enhancements.

Enterprise A2019.15 provides a separate installer (executable file) for Discovery Bot On-Premises users to install and use Discovery Bot from the Control Room. Starting from A2019.16, the Discovery Bot installer is integrated with the Enterprise A2019 installer. To upgrade from Enterprise A2019.15 to a later version, you must first uninstall Discovery Bot from your machine and install the Control Room.

1. In your Windows device, go to **Apps & features**.
2. Search for Discovery Bot.
3. Click **Uninstall**.
4. Install the latest version of the Control Room.

[Installing Control Room On-Premises](#)

5. From your local machine, log in to your Control Room as an administrator. The **Discovery Bot** tab is available for use from the left panel.

## Supported licenses for Discovery Bot

Learn about the supported Discovery Bot licenses to ensure business workers are ready to begin using Discovery Bot.

Process Discovery licenses must be purchased for use for business analysts and business users using Discovery Bot. Discovery Bot supports two licenses:

- Process analyzer license for the Discovery Bot analyst

This license allows a user to view and manage the metadata from all recordings within the process and create, view, and manage opportunities created from the recordings.

- Process recorder license for the Discovery Bot user

The process recorder license allows a user to view, record, and submit a process using the Discovery Bot recorder.

The following table displays detailed information for supported licenses and permissions for Discovery Bot business workers:

Discovery Bot user	System-provided Discovery Bot role	Discovery Bot features	Discovery Bot license required
Discovery Bot admin	<b>AAE_Discovery Bot Admin</b>	<ul style="list-style-type: none"> <li>• Create, view, update, and delete processes.</li> <li>• Assign Discovery Bot analyst and business user to processes.</li> </ul>	None
Discovery Bot analyst	<b>AAE_Discovery Bot Analyst</b>	<p>View assigned processes.</p> <hr/> <p><b>Note:</b> Assigned processes are only displayed after the processes are created by the Discovery Bot admin.</p> <hr/>	Process analyzer

Discovery Bot user	System-provided Discovery Bot role	Discovery Bot features	Discovery Bot license required
		View only recordings (including annotated steps and metadata) that they have created or been assigned to. An Analyst can also view recordings of other users in the process as long as they are in Approved state.  If a user is no longer assigned to a process, the user will lose access to the recordings.	Process analyzer
		View all recordings (own and other users), including metadata and annotated steps, for a given process.	Process analyzer
		<ul style="list-style-type: none"> <li>• Create, view, update, and delete manual generated aggregation</li> <li>• View all manually generated aggregations</li> </ul>	Process analyzer
		Create and view own opportunities for a given process.	Process analyzer
		Convert an opportunity to a bot.	Process analyzer for opportunity creation.  Bot Creator license is required to convert an opportunity to a bot.
		Export opportunity to Word.	Process analyzer

Discovery Bot user	System-provided Discovery Bot role	Discovery Bot features	Discovery Bot license required
Discovery Bot user	<b>AAE_Discovery Bot User</b>	<ul style="list-style-type: none"> <li>• Using the Discovery Bot recorder, create or more recordings for an assigned business process.</li> <li>• Update own recording to include annotations for the steps.</li> <li>• Delete one or more steps from own recording before submission.</li> <li>• View only recordings (including annotated steps, keyboard entered text, and application type) that they have created or been assigned to. The user can update the keyboard entered text field if the information should not be shared with the analyst (e.g. user ID and password).</li> </ul> <hr/> <p><b>Note:</b> Assigned processes are only displayed after the processes are created by the Discovery Bot admin.</p> <hr/> <p>If a user is no longer assigned to a process recording, the user will lose access to the recording data.</p>	Process recorder

## Create users for Discovery Bot

Create the Discovery Bot admin, analyst, and users to begin using the Discovery Bot functionality for front-office and back-office business processes. The Control Room admin creates these users and assigns the required system roles.

Ensure that you have purchased the necessary Discovery Bot licenses for your business users before you begin creating users: [Prerequisites for Discovery Bot](#).

To use the Discovery Bot features, the user must be assigned the appropriate role and licenses.

---

**Note:** The Discovery Bot Admin role and permissions are distinct from the Control Room Admin role. See [Discovery Bot users](#).

---

1. From your local machine, log in to your Control Room as administrator.
2. Go to **Administration > Users**.
3. Click **Create user**.

The icon is located at the top-right of the **Users** table.

The **Create user** page is displayed.

4. In the **General Details** section, enter the following user details:

<b>Enable User</b>	Select the check box so that the user can log in immediately.
<b>Username</b>	Enter a unique user name.
<b>Description</b>	Optional: Enter a description for the user.
<b>First name</b>	Optional: Enter the first name of the user.
<b>Last name</b>	Optional: Enter the last name of the user.
<b>Email</b>	Enter and confirm the email address for the user. If SMTP is enabled, the user is sent an email to this address to confirm the account. Click the URL in the email to log in to the Control Room and set up your credentials. All important Control Room notifications will be sent to this email address.

5. In the **Select Roles** section, select one of the following roles from the **Available roles** column:

Discovery Bot user	Select this role
<b>Admin</b>	<b>AAE_Discovery Bot Admin</b>
<b>Analyst</b>	<b>AAE_Basic</b> and <b>AAE_Discovery Bot Analyst</b>  <b>Note:</b> The <b>AAE_Basic</b> role is required to view or add actions to the bots.
<b>Business user</b>	<b>AAE_Basic</b> and <b>AAE_Discovery Bot User</b>  <b>Note:</b> The <b>AAE_Basic</b> role is required to view or add actions to the bots created by the analyst.

6. Click the right arrow to move the role to the **Selected** column.

7. In the **Allocate a device license to this user** section, select the following:

Discovery Bot user	Action
<b>Admin</b>	Retain the default <b>None</b> for the user. This user only has access to the Control Room.
<b>Analyst</b>	Assign the <b>Bot Creator - Development license</b> to this user. <hr/> <b>Note:</b> This license is required to convert an opportunity to a bot. <hr/>
<b>Business user</b>	Retain the default <b>None</b> for the user. This user only has access to the Control Room.

8. In the **Allocate other types of licenses for this user** section, select the following:

Discovery Bot user	Action
<b>Admin</b>	No license is required.
<b>Analyst</b>	Select the <b>Process analyzer</b> license.
<b>Business user</b>	Select the <b>Process recorder</b> license.

9. Click **Create user**.

The new user is displayed in the User table. If SMTP is enabled, an email will be sent to the new user inviting them to log in.

### *Create a Discovery Bot process*

You can begin capturing business processes using Discovery Bot. Create a process and assign users to record and capture the process using the Discovery Bot recorder.

## Create multi-role users for Discovery Bot

Create multi-role users when you want to combine system-generated Discovery Bot roles and licenses to provide additional functionality for your users. Depending on your business requirements, you can combine up to three Discovery Bot system-generated roles and two process discovery licenses.

Ensure that you have purchased the necessary Discovery Bot licenses for your business users: [Prerequisites for Discovery Bot](#).

To use the Discovery Bot features, the user must be assigned the appropriate role and licenses.

---

**Note:** The Discovery Bot Admin role and permissions are distinct from the Control Room Admin role. See [Discovery Bot users](#).

---

Multi-role users will see a different set of menu actions (vertical ellipsis icon) available on a tile for a process. These actions are different from the standard Discovery Bot user actions that are available on a tile for a process.

The following actions are available for multi-role users (Admin + Business user + Analyst) on a tile for a process:

#### **Admin actions**

- View process details
- Edit process details
- Delete process

**Business user actions**

- Start recording

The **Start Recording** icon is displayed on a tile for a process, or you can select start recording from the vertical ellipsis icon.

- Edit my recording

**Analyst action**

Analyze processes

1. From your local machine, log in to your Control Room as administrator.
2. Go to **Administration > Users**.
3. Click **Create user**.

The icon is located at the top-right of the **Users** table.

The **Create user** page is displayed.

4. In the **General Details** section, enter the following user details:

**Enable User**

Select the check box so that the user can log in immediately.

**Username**

Enter a unique user name.

**Description**

Optional: Enter a description for the user.

**First name**

Optional: Enter the first name of the user.

**Last name**

Optional: Enter the last name of the user.

**Password**

Optional: Enter your password and confirm the password.

**Email**

Enter and confirm the email address for the user. If SMTP is enabled, the user is sent an email to this address to confirm the account. Click the URL in the email to log in to the Control Room and set up your credentials. All important Control Room notifications will be sent to this email address.

5. In the **Select Roles** section, select the following roles from the **Available roles** column to create multi-role users:

Discovery Bot user	Select this role
<b>Admin + Business user</b>	<b>AAE_Discovery Bot Admin</b> and <b>AAE_Discovery Bot User</b>
<b>Admin + Analyst</b>	<b>AAE_Basic</b> , <b>AAE_Discovery Bot Admin</b> , and <b>AAE_Discovery Bot Analyst</b>
<b>Business user + Analyst</b>	<b>AAE_Basic</b> , <b>AAE_Discovery Bot User</b> , and <b>AAE_Discovery Bot Analyst</b>
<b>Admin + Business user + Analyst</b>	<b>AAE_Basic</b> , <b>AAE_Discovery Bot Admin</b> , <b>AAE_Discovery Bot User</b> , and <b>AAE_Discovery Bot Analyst</b>

6. Click the right arrow to move the roles to the **Selected** column.

7. In the **Allocate a device license to this user** section, select the following:

Discovery Bot user	Action
<b>Admin + Business user</b>	Retain the default <b>None</b> for the user. This user only has access to the Control Room.
<b>Admin + Analyst</b>	Assign the <b>Bot Creator - Development license</b> to this user.  <b>Note:</b> This license is required to convert an opportunity to a bot.
<b>Business user + Analyst</b>	Assign the <b>Bot Creator - Development license</b> to this user.  <b>Note:</b> This license is required to convert an opportunity to a bot.
<b>Admin + Business user + Analyst</b>	Assign the <b>Bot Creator - Development license</b> to this user.  <b>Note:</b> This license is required to convert an opportunity to a bot.

8. In the **Allocate other types of licenses for this user** section, select the following:

Discovery Bot user	Action
<b>Admin + Business user</b>	Select the <b>Process recorder</b> license.
<b>Admin + Analyst</b>	Select the <b>Process analyzer</b> license.
<b>Business user + Analyst</b>	Select the <b>Process analyzer</b> and <b>Process recorder</b> licenses.
<b>Admin + Business user + Analyst</b>	Select the <b>Process analyzer</b> and <b>Process recorder</b> licenses.

9. Click **Create user**.

The new user is displayed in the User table. If SMTP is enabled, an email will be sent to the new user inviting them to log in.

### *Create a Discovery Bot process*

Log in with your multi-role credentials and create a process. Assign users to record and capture the process using the Discovery Bot recorder. Review and analyze business processes.

## Create a custom role for Discovery Bot

Learn how to create a Discovery Bot custom role that allows users to select Discovery Bot feature permissions from standard business user roles (Admin, Business user, or Analyst roles), and a single Control Room admin feature permission for viewing users.

Ensure that you have purchased the necessary Discovery Bot licenses for your business users: [Prerequisites for Discovery Bot](#).

To use the Discovery Bot features, the user must be assigned the appropriate role and licenses.

---

**Note:** The Discovery Bot Admin role and permissions are distinct from the Control Room Admin role. See [Discovery Bot users](#).

---

### Use case

The Discovery Bot custom role user is enabled with Control Room Admin feature permissions for viewing users, but does not have edit permissions. The role allows the user to view and manage all Discovery Bot feature permissions for processes, recordings, aggregations, and opportunities. However, the role does not allow the user to view opportunities or the associated metadata created by other analysts in the **Opportunities** tab. The permission to view all opportunities is not enabled for the user.

1. From your local machine, log in to your Control Room as administrator.
2. Go to **Administration > Roles**.
3. Click **Create role**.  
The icon is located at the top-right of the **All roles** table.  
The **Create role** page is displayed.
4. Enter a **Role** name, and optionally enter a **Role** description.
5. Scroll to the **Administration** section.
6. Select **View users**.
7. Select **View roles**.
8. Scroll to the **Discovery Bot** section.
9. Select **View assigned process** at the parent level.  
The child-level permissions are enabled.
10. Select **all** the following feature permissions:
  - a) **Discovery Bot** process feature permissions at the child level
  - b) **Discovery Bot** recording feature permissions at the parent and child levels
  - c) **Discovery Bot** aggregation feature permissions at parent and child levels
  - d) **Discovery Bot** opportunity feature permissions at the parent and child levels

---

**Note:** Do **not** select **View all opportunities**.

---

11. Click **Create role**.  
The **Discovery Bot** custom role is created.

*Assign the Discovery Bot custom role to a user*

## Assign the Discovery Bot custom role to a user

Create a new user and assign the **Discovery Bot** custom role you created to the user.

Ensure that you have purchased the necessary Discovery Bot licenses for your business users: [Prerequisites for Discovery Bot](#).

To use the Discovery Bot features, the user must be assigned the appropriate role and licenses.

**Note:** The Discovery Bot Admin role and permissions are distinct from the Control Room Admin role. See [Discovery Bot users](#).

Custom role users will see a different set of menu actions (vertical ellipsis icon) available on a tile for a process, depending on the permissions given to users. These actions are different from the standard Discovery Bot user actions that are available on a tile for a process.

For this custom role use case, the following actions are available on a tile for a process:

#### Admin actions

- View process details
- Edit process details
- Delete process

#### Business user actions

- Start recording

The **Start Recording** icon is displayed on a tile for a process, or you can select start recording from the vertical ellipsis icon.

- Edit my recording

#### Analyst action

Analyze processes

1. From your local machine, log in to your Control Room as administrator.
2. Go to **Administration > Users**.
3. Click **Create user**.

The icon is located at the top-right of the **Users** table.

The **Create user** page is displayed.

4. In the **General Details** section, enter the following user details:

#### Enable User

Select the check box so that the user can log in immediately.

#### Username

Enter a unique user name.

#### Description

Optional: Enter a description for the user.

#### First name

Optional: Enter the first name of the user.

#### Last name

Optional: Enter the last name of the user.

#### Password

Optional: Enter your password and confirm the password.

#### Email

Enter and confirm the email address for the user. If SMTP is enabled, the user is sent an email to this address to confirm the account. Click the URL in the email to log in to the Control Room and set up your credentials. All important Control Room notifications will be sent to this email address.

5. In the **Select Roles** section, select the **AAE\_Basic** role and the Discovery Bot custom role you created from the **Available roles** column.
6. Click the right arrow to move the roles to the **Selected** column.
7. In the **Allocate a device license to this user** section, select the **Bot Creator - Development license**.
8. In the **Allocate other types of licenses for this user** section, select the **Process analyzer** and **Process recorder** licenses.

**9. Click Create user.**

The new user is displayed in the User table. If SMTP is enabled, an email will be sent to the new user inviting them to log in.

*Create a Discovery Bot process*

Log in with your custom role credentials and create a process. Assign users to record and capture the process using the Discovery Bot recorder. Review and analyze business processes.

## Create a Discovery Bot process

Create a Discovery Bot process and assign users to record and analyze a process for your automation requirements.

- This task is performed by the Discovery Bot admin who manages the creation, deletion, and editing of Discovery Bot processes.

---

**Note:** Multi-role and custom role user can also perform this task depending on the roles or the permissions given to users. You will see a different set of menu actions (vertical ellipsis icon) available on a tile for a process.

---

- Ensure the **Process recorder** license is allocated to Discovery Bot users assigned to recording a process.
- Ensure the **Process analyzer** license is allocated to the Discovery Bot analyst assigned to analyzing a process.
- Create a process and assign users:
  - a) From your local machine, log in to your Control Room as a Discovery Bot administrator.
  - b) Go to **Discovery Bot > Processes**.
  - c) Click **Create Process**.  
The **Create process** page is displayed.
  - d) In the **General Details** tab, enter a **Process Name** .  
Special characters are not supported. Creating a process with a duplicate name is not supported.
  - e) Optional: Enter a **Process Description**.
  - f) Click **Next** to assign users to a process.
  - g) Optional: In the **Users** tab, select the Discovery Bot business user or analyst from the list of **Available** users.
  - h) Click the right arrow to move the roles to the list in the **Selected** column.
  - i) Click **Create Process**.
  - j) Click **Close** to exit the page and return to the **Processes** page.

---

**Note:** An email invitation is sent to assigned users (new users or users added at a later time) to begin a Discovery Bot process recording session.

---

The newly created process is displayed in the **Processes** page on a tile.

For users, all of their assigned processes are available for viewing from the **Processes** page. Use the search field to help you locate a specific process by name. The field is not case-sensitive. For users, use the field to search on a process you are assigned to. For admin users, use the field to search on all processes. Use the sort field to help you locate a process tile quickly. Click the drop-down to sort for a process tile based on the process name in alphabetical order or you can sort

in the order of newest process created to oldest process and vice versa. The tile for a process displays the following information for an admin user:

Process tile	Description
Recordings	The number of the recordings captured and stored for a process by users.
Process Cycle	The average time, in minutes and seconds, across all recordings captured for a process.
Vertical ellipsis icon (three dots)	<p>View, edit, or delete information for a process.</p> <ul style="list-style-type: none"> <li>Click <b>View process details</b> to view more information about a process, edit and update information, and save changes.</li> <li>Click <b>Edit process details</b> to edit a process. Enter your changes and click <b>Save changes</b>. Click <b>Close</b> to return to the <b>Processes</b> page.</li> </ul> <hr/> <p><b>Note:</b> The name of the process cannot be changed.</p> <hr/> <ul style="list-style-type: none"> <li>Click <b>Delete process</b> to delete a process. A message window appears.</li> <li>Click <b>Yes, delete</b> to delete a process.</li> </ul> <p>All recordings and associated data are permanently deleted. This cannot be undone.</p> <p>Click <b>No, cancel</b> to return to the <b>Processes</b> page.</p>

- Create a process and add users at a later time:
  - From your local machine, log in to your Control Room as a Discovery Bot administrator.
  - Go to **Discovery Bot > Processes**.
  - Click **Create Process**.  
The **Create process** page is displayed.
  - In the **General Details** tab, enter a **Process Name**.  
Special characters are not supported. Creating a process with a name previously used for another process is not supported.
  - Optional: Enter a **Process Description**.
  - Click **Create Process** to create a process without assigning users.
  - Click **Close** to exit the page and return to the **Processes** page.

- Update an existing process and add users.
  - a) From your local machine, log in to your Control Room as a Discovery Bot administrator.
  - b) Go to **Discovery Bot > Processes**.
  - c) Go to the process you want to edit.
  - d) Click **Edit** from the **Options** icon.
  - e) In the **Edit process** page, click **Next** to assign users to a process.
  - f) In the **Users** tab, select the Discovery Bot business user or analyst from the list of **Available** users.
  - g) Click the right arrow to move the roles to the list in the **Selected** column.
  - h) Click **Save changes**.
  - i) Click **Next** to view the invitation that is sent to users to begin recording processes.
  - j) Click **Close** to exit the page and return to the **Processes** page.

---

**Note:** An email invitation is sent to assigned users (new users or users added at a later time) to begin a Discovery Bot process recording session.

---

The newly created process is displayed in the **Processes** page on a tile.

### *Record a Discovery Bot business process*

Log in to your Control Room as a Discovery Bot user and record a business process assigned to you.

## Supported applications and browsers for Discovery Bot

Learn about supported applications and browsers to ensure your environment is ready before you begin using the Discovery Bot recorder.

### About the Discovery Bot recorder

The Discovery Bot recorder is similar in function to the Automation 360 Universal Recorder with one significant difference: pre-selection of the application to be used for recording is not required.

The Discovery Bot recorder captures data across many user interface (UI) objects such as Windows applications, native applications, executable file, or browser window on PC devices and machines or virtual machines running Windows OS. Use the Discovery Bot recorder to capture, read (data extraction), write (data entry), and click (left or right) operations when working across various operations. A single recording per user can capture up to 8 hours of user actions.

The Discovery Bot recorder allows you to highlight text for read and write applications, for example, highlighting a text field in Excel. You can highlight where you click or enter data with a red highlighted box shown when using the Universal Recorder. Click the object control, for example, a button, form field, or a table. A red outline highlights the control when you move the mouse over it to capture the action.

You can perform actions like double-click, drag-drop, click and hold, and text select while recording. Actions performed using keyboard strokes are displayed in the **Data** field.

## Supported applications and browsers

The recorder supports system, web, and virtual applications including the following:

### Applications

- Microsoft applications: Edge, PowerPoint, Excel, Word, Outlook, Calculator, Notepad, Notepad++, Teams
- Zoom
- Snagit
- Java applet, web start, and desktop applications that run using Java Runtime Environment (JRE) 6, 7, 8, 9, 10, and 11 (32-bit and 64-bit versions)
- Microsoft Active Accessibility and UI automation based applications
- Oracle EBS and Forms
- SAP 730, 740, 750 and 760 versions.
- Citrix Virtual Apps

### Browsers

- Internet Explorer version 11
- Google Chrome

---

**Note:** Chrome plug-in must be installed to record processes. If the Chrome plug-in is removed, you must manually add and re-enable the plug-in. [Google Chrome browser extension requirements](#)

---

### Desktop

The desktop refers to the device screen when all application and browser windows are minimized.

### Taskbar

The taskbar is the horizontal or vertical bar containing icons of open applications and browsers, as well as the notification area. You can capture application, browser, system, and other icons, for example such as the clock and calendar, volume, and Wi-Fi.

## Record a Discovery Bot business process

Record, capture, and annotate steps for a business process using the Discovery Bot recorder. The process recording allows the Discovery Bot analyst to view all recorded steps for a quantitative and comparative analysis. The steps along with the captured metadata and user actions help the analyst make the decision to create opportunities and bots.

- This task is performed by the Discovery Bot user who records assigned business processes and submits the same for review and analysis.

---

**Note:** Multi-role and custom role user can also perform this task depending on the roles or the permissions given to users. You will see a different set of menu actions (vertical ellipsis icon) available on a tile for a process.

---

- Ensure that you have set your device credentials and installed the latest Bot agent version on your machine before using the Discovery Bot recorder.
- Ensure that the machine on which you will be performing the recordings is also duly registered.

#### *Prerequisites for Discovery Bot*

### 1. Record a business process:

- a) From your local machine, log in to your Control Room as Discovery Bot business user.
- b) Go to **Discovery Bot > Processes**.  
The **Processes** page appears, displaying all processes assigned to the user for recording.
- c) Click the **Start Recording** icon from the tile associated with the process you want to begin recording a process.

---

**Note:** You can also select, **Start Recording** from the from the vertical ellipse icon to begin recording a process.

---

The **Discovery Bot Recorder** window is displayed with **Pause** and **Stop** options. Pause and resume the recording as required. Allow for a few minutes for the recorder to start the very first time you begin recording a process.

- d) Perform the actions to record.  
For example, open an application and fill in a form or open a browser and search a website. Click the object control, for example, a button, form field, or a table. A red outline highlights the control when you move the mouse over it to capture the action. The red outline indicates that the recorder is ready for you to take the next action in recording the process.  
You can perform actions like double-click, drag-drop, click and hold, and text select while recording. Actions performed using keyboard strokes are displayed in the **Data** field.
- e) Click **Stop** to end the recording.  
You can click **Cancel recording** to cancel a recording at any time.  
Wait for a few seconds for the recorder to end. The details in the tile for the process is incremented to include the new recording in the **Recordings** section.

---

**Note:** Once the recording has been stopped, additional steps cannot be added to the recording.

---



---

**Note:** A maximum of 8 hours worth of user actions can be captured in a single recording.

---

### 2. Review the captured steps, annotate, and submit a process recording for review to the Discovery Bot analyst:

- a) From **Processes**, click a process by clicking the process name or anywhere within the process tile body.

For Discovery Bot multi-role and custom role users, click the vertical ellipsis icon and select **Edit my recording** to edit and review recordings. If you click the process tile body or the process name, the **View process** page appears. Only approved recordings are displayed for the analyst on the **View process** page.

The **Recordings** page appears with the **Recordings** table on the left and single recording details on the right. The table displays the following information:

Recordings	Description
Recordings (#) (# selected)	The number of recordings logged in by users.

Recordings	Description
Customize columns	Click the table icon to display or hide columns (ID, Status, Process Cycle, and Recorder), or edit the layout of the header rows to display right or left as required.
ID	<p>The ID number of the recording in the database. The system collects and sequentially increments the index for each recording captured by the users.</p> <hr/> <p><b>Note:</b> To search for a specific recording, select <b>ID</b> and enter the ID number in the search bar.</p> <hr/>
Status	<p>The status of the recording:</p> <ul style="list-style-type: none"> <li>• Pending: Initial state.</li> <li>• Approved: All user-required edits have been completed and recording is ready for review by an analyst.</li> <li>• Error: There is an error when storing the recording in the system.</li> <li>• Declined: Currently not being used.</li> </ul> <hr/> <p><b>Note:</b> To search on a process status, select <b>Status</b> and choose a status from the drop-down list.</p> <hr/>
Process Cycle	The recording duration, in minutes and seconds, excluding the time that the recorder was paused.
Recorder	<p>The name of the user that created the recording.</p> <hr/> <p><b>Note:</b> To search on users assigned to a recording, select <b>Recorder</b> from the drop-down list and enter the user name in the search bar. The search is case-sensitive.</p> <hr/>

3. In the **Recordings** table, select the ID to view all captured steps. In the right pane, the header displays the recording ID details, including the total steps captured during the recording session. Each recorded step includes: screenshot image with the **Screen** option (icon), application type, data (keyboard entered text), and step description (annotated user text) fields.

**4. Optional:** Click the **Screen** icon to display or hide the screenshot image.

Use the **Screen** option icon when you do not want to share personal image details with the Discovery Bot analyst, multi-role, or custom role users. To remove personal information, for example username and password credentials from the image, edit the **Data** field prior to submission for analyst review.

---

**Note:** If you hide an image and Click **Submit**, you cannot display the image again.

---

**5.** Click the screenshot to display the image in full size.

The **Screenshot** shows the state of the application at the time of performing the associated action. You cannot edit the screenshot. Click the image when you want to display a larger view of the screenshot. Review the step action in more detail from the modal window. Click the pagination located below the image to select a step number or use the right or left arrows to quickly display all captured images. For actions not captured by the recorder such as double-click, drag-drop, and click and hold, you can document the individual steps in the **Step description** field for the analyst.

The duration of the recorded step is displayed in minutes and seconds below the screenshot. Use this information to help prioritize what step or sequence of steps are a better candidate for automation. For example, if a sequence of steps takes longer to perform, you can automate this first for a process to save manual effort.

- Click the **Hide image** icon to hide the image.

The image will not be submitted to the analyst for review. Click **X** to close the frame. Click **Save** to save your selection.

- Click **Show image** to display the image.

The image will be submitted to the analyst for review. Click **X** to close the frame. Click **Save** to save your selection.

**6.** Optional: Update the application name used in the process recording in the **Application** text field.

The **Application** field represents the name of the application on which the action was performed. If required, the user that made the recording can change this.

**7.** Optional: Update the keyboard entered text used in the process recording in the **Data** text field.

The **Data** field represents any data entered by the user at that step during the recording.

---

**Note:** You must follow the keyboard data entry with a left or right mouse click. For any step in which the data was entered, you can make changes to the data in the **Data** field. You cannot enter any data for steps which do not have any data entered during the actual recording of the process.

---

**8.** Optional: Update the context associated with the step in the **Step description** text field.

The **Step description** text field represents any additional description that you would like to provide regarding the operation being performed. The maximum character limit is 2000.

**9. Optional:** Delete any step that is not required to be included in the process recording.

**10.** Repeat the above steps for each step as required.

**11.** Optional: Click **Save** to save your changes.

Use the **Save** option when you want to edit and compare the recording data (including application, keyboard entered text, and annotation text fields) across multiple recordings captured in the **Recordings** table.

**12.** Click **Submit**.

The recording is submitted to the analyst for review and approval.

---

**Note:** After a recording is submitted, it cannot be edited to make additional changes.

---

Log in to your Control Room as a Discovery Bot analyst to review and analyze the recordings to create opportunities or bots as required.

## Analyzing processes for automation

Review and analyze data from the Dashboard tab, create views from a starter recording in the Aggregated tab view, and add steps from one or more recordings to another recording to create a variant (branch). Compare up to three views, three recordings, or combine views and recordings side-by-side simultaneously.

### Dashboard tab

The Dashboard tab provides a snapshot of a view or a recording data captured by all users for an assigned process. The following data is displayed in the **Dashboard** header:

Field	Description
Participants	Totally number of users that have submitted recordings for the process.
Process cycle	The average duration of the recordings provided for the process.
RPA opportunity	The number of the opportunities that include the selected recordings.
Applications involved	The totally number of applications used in a recording session by all assigned users.
Bots involved	The number of bots created from the selected recordings.

### Application usage

The doughnut chart displays the number of applications used across selected recordings or views. The application usage details are displayed in the table to the right of the chart in the following format: Application | minutes seconds | percentage. The percentage represents the percent of the application used over a total of all applications used.

### Use case

Use this information to quickly understand user participation and process complexity and variability; the higher the application count, the higher the complexity and variability of the process that is being analyzed. The average process cycle time will provide a quick insight into the duration of the process within the expected processing time. If the actual process cycle is higher across application count, this might be an indicator that the process is a more suitable candidate for automation and assists with improving efficiency.

### Process cycle by recorder

The graph displays the time associated with the average process cycle (in minutes) grouped by users for all the selected recordings.

**Use case**

Use this information to compare the average recording time for each participant. For example, an analyst can learn why a recording session took longer or was completed in a shorter period for one particular participant and compare this information with other participants. This information is instrumental in narrowing down on a smaller subset of the recordings to study them for inefficiencies that might result in better or more opportunities for automation.

## Recordings comparison

The graph displays the recording ID on the x-axis and the recording time on the y-axis across all selected recordings or a view from the table.

**Use case**

Use this information to quickly determine and compare a particular recording against other recordings in a process based on the duration of the recording. For example, you can select 10 recordings in the **Recordings** table and note that one particular recording is taking five times longer compared to the other recordings. By filtering on that one recording ID, you can see how the other recordings compare against each other. This information can later be used to identify the essential steps to create an opportunity. An alternative to using the chart is to sort the **Recordings** table using the Process cycle column in ascending or descending order.

## Aggregated tab

The Aggregated tab provides an end-to-end view of the complete recording as a series of steps. Multiple continuous steps performed in the same application are automatically collated and displayed as a group to improve the readability of the process. Selecting a step opens the Preview pane (if hidden) and displays additional information about the step along with its screenshot. The aggregated view also provides you the ability to combine steps from multiple recordings into a view. This is also the section from where opportunities can be created from recordings and views.

---

**Note:** An opportunity can only be created from a single recording or a single view at one time.

---

**Use case:** Reviewing the credit score for loan processing from the **Aggregated** tab:

- View steps from a single recording
- Review step details from the recording individually
- Create views of your process workflow by combining steps multiple recordings
- Combine steps from different recordings, create a branch in the view and add steps from the additional recording
- Create any number of branches within a view where each branch represents one set of value for the underlying condition.
  - For example, for a loan with a credit of score less than 200, there might be one set of steps to follow and for higher score there might be a different branch where the other set of steps are being followed.
  - In the above example, the condition is credit score and the condition values are less than 200 for one branch and greater than or equal to 200 for the other branch, or greater than 200 and equal to 200 for two additional branches.
- Add steps from a single recording with steps from one or more recordings into a branch.
- Add steps from another recording into a new branch to the view. Drag and drop steps from a recording into a new branch in the view.
- Review views created by other users within the process.

- Create copies of views and make modifications as necessary.

## Comparison tab

Compare up to three views, three recordings, or combine views and recordings side by side simultaneously. You cannot edit in this flow. You can only display recordings, views, or recordings and views.

### Use case

The **Comparison** tab enables you to quickly see which recordings follow the expected or understood process. By selecting multiple recordings, you can display the following:

- How the steps might be completely different across the recordings
- The different number of steps within the grouping of the same application
- The difference in the sequence of steps
- The different types of applications being used in the recording session

Comparing multiple recordings enables you to understand how and where the use of bots can automate these steps, resulting in a more streamlined, efficient process.

## Review and compare recording data

Learn how to review and analyze data from the Comparison view in Discovery Bot. You can view data by selecting up to three views, three recordings, or combine views and recordings side by side simultaneously.

- This task is performed by the Discovery Bot analyst who is in charge of reviewing and analyzing the associated recordings for business processes.
- Ensure the user is assigned the **AAE\_Discovery Bot Analyst** role and process analyzer license.

### *Supported licenses for Discovery Bot*

1. Review and analyze recordings in the **Dashboard** view:
  - a) From your local machine, log in to your Control Room as Discovery Bot analyst.
  - b) Go to **Discovery Bot > Processes**.  
The **Processes** page appears, displaying all assigned processes available for an analyst to review.
  - c) Select a process to review.  
By default, the first time a process is selected for review, the **Dashboard** tab appears. You can select a view or a recording and display data from the **Dashboard** tab.  
  
If you select a specific tab (**Dashboard**, **Aggregated**, or **Comparison** tab) and log out of the Control Room, the last active tab that was selected appears when you log back into the Control Room.
2. Click the **Comparison** tab to view and compare views, recordings, or a combination of views and recordings.  
The initial screen is displayed with no views or recordings selected.

### 3. Compare up to three Aggregated views.

You can compare a minimum of two views or two recordings, or a combination of views and recordings. The maximum allowed is three views, three recordings, or a combination of views and recordings.

- a) Mouse over the actions menu in the **Views** table.
- b) Click the + (plus) sign from the row-level toolbar to add views.  
The aggregated view is displayed.
- c) Click the - (minus) sign from the row-level toolbar to remove views.  
If there are only two views or two recordings, or a combination of views and recordings displayed, then removing one entry will default the display to the initial view. The initial screen appears with no views or recordings selected.  
The aggregated view is removed.
- d) Repeat the steps to display a maximum of three views to compare.  
By default, you must select up to two views or two recordings, or a combination of views and recordings for the data to be displayed in the **Comparison** view.
- e) Use the **Reset**, **Zoom in**, or **Zoom out** options as required.  
These options can be used individually per column for a view or recording.
- f) Use the screenshot icon or application icon in the toggle view (upper-right corner of the **Comparison** view) to decide how you want to display the steps.  
The screenshot icon or application icon view affects all columns in the **Comparison** view.

### 4. Compare up to three recordings.

You can compare a minimum of two views or two recordings, or a combination of views and recordings. The maximum allowed is three views, three recordings, or a combination of views and recordings.

- a) Mouse over the actions menu in the **Recordings** table.
- b) Click the + (plus) sign from the row-level toolbar to add recordings.  
The recording is displayed.
- c) Click the - (minus) sign from the row-level toolbar to remove recordings.  
If there are only two views or two recordings, or a combination of views and recordings displayed, then removing one entry will default the display to the initial view. The initial screen appears with no views or recordings selected.  
The recording is removed.
- d) Repeat the steps to display a maximum of three recordings to compare.  
By default, you must select up to two views or two recordings, or a combination of views and recordings for the data to be displayed in the **Comparison** view.
- e) Use the **Reset**, **Zoom in**, or **Zoom out** options as required.  
These options can be used individually per column for a view or recording.
- f) Use the screenshot icon or application icon in the toggle view (upper-right corner of the **Comparison** view) to decide how you want to display the steps.  
The screenshot icon or application icon view affects all columns in the **Comparison** view.

#### *Create a process view with branches and opportunities*

Create a consolidated view of your business process, review recordings, and create a branch. Create potential opportunities.

## Create a process view with branches and opportunities

Create a consolidated view of your business process and select steps to create potential opportunities for automation. Learn how to create a branch, merge steps into the branch, and create opportunities.

- This task is performed by the Discovery Bot analyst who is in charge of reviewing and analyzing the associated recordings for business processes.

---

**Note:** Multi-role and custom role user can also perform this task depending on your assigned permissions. You will see a different set of menu actions (vertical ellipsis icon) available on a tile for a process.

---

- Ensure the user is assigned the **AAE\_Discovery Bot Analyst** role and process analyzer license.

*Supported licenses for Discovery Bot*

1. Display a view or recording, select steps, and create an opportunity in a linear workflow in the **Aggregated** tab:
  - a) Select a process from the processes page.  
The last active tab automatically opens.
  - b) Click the **Aggregated** tab.  
By default, the selected view is displayed in the **Aggregated** tab main screen. In the **Recordings** table, the check boxes that are selected indicate the recordings included in the view.

To select a single recording when a view is displayed, toggle off the selected view from the **Views** table. In the **Recordings** table, clear the check box for the selected recording that is enabled.

By default, if a view is not selected, all recordings are selected in the **Recordings** table. To select a single recording, click the **Select all** check box to clear all recordings. Select a recording for display in the **Aggregated** tab main screen.

- c) Select either the screenshot icon or application icon in the toggle view (upper-right corner of the **Aggregated** tab view) to decide how you want to display the steps.

Contiguous steps performed in the same application are combined together. This is displayed as a single group to allow better readability of the process. The number of steps collated together is indicated in the bottom-right corner of the group.

---

**Note:** If the screenshot view is the last active view then the image of the last step in the group is the one that is displayed for the collapsed group. You can drag the process within the canvas by holding the down the mouse left button and moving the process to the desired location.

---

Use the **Zoom in**, or **Zoom out** options as required. Use the **Reset** zoom to bring the view back to the default level and re-center the process in the canvas.

- d) Click a single aggregated step or click the + (plus) sign to expand a group of steps to preview the step in more detail.

Click the - (minus) sign to collapse the steps. This information is helpful in deciding what steps to use to create a potential opportunity.

Click on the individual step to display details about the step in the **Preview** window on the right of the **Aggregated** view. The information is displayed in the following order:

Field	Description
Application name	The application type used during the recording. A screenshot is displayed. The <b>Application</b> field is displayed after the <b>Step ID</b> field.
Step Title	The step title can be the PNG name or tab name determined by the system.
List of recordings in this workflow	The recording ID associated with the step.
Step ID	The internal ID associated with the recording for back-end processing.
Data	The data entered by a user through the keyboard.
Action Type	The action type can right-click or left-click.

Field	Description
Time on step	The duration of the recorded step in minutes and seconds.

- e) Select the check box to the left of the step to create a potential opportunity.  
The **Opportunities details** window displays the following information:

Field	Description
Steps	The number of steps selected by the user. This field increments each time a user checks the box to select a step and create a potential opportunity.
Select all steps	<p>Allows you to select all steps, including branches, displayed in the view to create an opportunity.</p> <p><b>Select a group of steps/branches/loops</b></p> <p>From the canvas view, select the check box next to a branch, loop, or group to select all steps within that group, branch, or loop. If you select a nested branch or loop, the parent branch or loop displays a partial selection.</p> <p><b>Custom selection of steps</b></p> <p>Use the shift key to select a certain number of steps within a path from the main canvas. Cross path selection is not available</p>
Average time	The duration, in minutes and seconds format, of the selected steps in the opportunity.

Field	Description
Variant	The number of branches included in the opportunity.

- f) Enter a name for the opportunity.
- g) Enter the average cost associated with the opportunity.  
This is your best assessment of what it costs to perform the steps included in the opportunity.
- h) Enter the potential saving associated with the opportunity.  
This is your best assessment of the expected savings on an annual basis, if a bot is used to perform all the steps in the opportunity.

---

**Note:** The potential savings must be larger than the average cost estimate.

---

- i) Select from High, Medium, or Low as the priority associated with the opportunity.
- j) Click **Create opportunity**.  
A message window appears notifying you that the opportunity is created. Click the hyperlink to view the newly created opportunity from the **Opportunity** tab in the Control Room.
- k) To create another opportunity from the same recording, click **Unselect all** to clear all the previously selected steps or change the selection as required, provide the details (name, cost, savings and priority).
- l) Click **Create opportunity**.  
Multiple opportunities can be created with same name – each one has a new id.

## 2. Create a view for your workflow process from the **Aggregated** view:

- a) With one or more recordings preselected in the **Aggregated** view, click **Create view** to create a view from the open recording.  
Creating a view enables you to combine steps from multiple recordings to give you a more complete view of the entire process represented by the recordings.
- b) Enter a name for the view in the **Title** field.
- c) Optional: Enter a description.
- d) Click **Create**.

The **Create** option is now updated to display **Save view** options from the drop-down. Use **Save as** to create a copy of the newly-created view. Use **Save as [manual]** to convert the system generated view to a manual view.

Create any number of views as required. To create a new view, toggle off the selected view from the **Views** table. Use the arrows to open and collapse the **Views** and **Recordings** table. Use the pagination to scroll through your saved views.

The system generated view now displays a loop, or a sequence of steps that occur for specific number of times for a single recording. The loop icon is displayed as an orange circle with an arrow. The loop icon has a **for** condition displayed under this along with a **Count**, which describes the number of times the sequence of steps in this loop is repeated in the process. You can change the loop condition (**for** and **while**) by saving the view as a manual view.

The system generated view is displayed in the **Aggregated** view main screen. In the **Views** table, the system generated view is indicated by the aggregate icon in the **Type** column. In the **Recordings** table, the check box is selected to indicate the recordings already included in the view. By default, the table is collapsed and the **Recordings** table is expanded when a view is

created for the first time. The **Recordings** table returns to the first pagination. You are now ready to add recordings and branch, if required.

- e) Select the **Model** option when you want to compare and find the best aggregated view for your recordings. Use this option to save as many views with different combinations as needed. You can also save the view as a manual view to further customize your view and compare side by side. Select from an **Easy** or **Strict** model that will allow you to view the recordings where the steps are the same vs. recordings with different results with more branches in the process path. By default, the **Easy** option is selected. To save your selections before you toggle off a view to another view, click **Save view**. The changes are saved across the **Dashboard, Aggregated, and Comparison** tabs. If you do not save your changes, the filter resets. You must re-select and apply your options again. Click **Model** to select from the following options for display from the **Aggregated** tab:

The **Model** window displays the following:

Option	Action
Easy	Select <b>Easy</b> when you expect most of the recordings for a given process to be same. This results in less branching across selected views and recordings. You will expect to see two steps merged because there is less variance across the recordings.  <b>Tip:</b> Click <b>Select all steps</b> . The total number of steps displayed is less than the number of steps displayed when using the <b>Strict</b> option. There are less steps with the <b>Easy</b> option because most of the steps across selected recordings are the same.
Strict	Select <b>Strict</b> when you expect to see different results for a given process. This results in more branching across selected views and recordings.
Include data	Select <b>Include data</b> to include keyboard entered data used during the recording session. This information is displayed from the <b>Preview</b> window.
Include description	Select <b>Include description</b> to include any annotations provided by the Discovery Bot user. This information is displayed from the <b>Preview</b> window.
Reset	Click <b>Reset</b> to reset your selected options and reapply. By default, this resets to the <b>Easy</b> option.

Option	Action
Apply	Click <b>Apply</b> to apply your selected options for display from the <b>Aggregated</b> tab for the system generated or manual view.

- f) Select the **Filter** option when you want to use a set of values to compare the different sections of a process across various recordings by selecting a specific path and step filter. Used in conjunction with the **Model** option, the path and step filter options for a system-generated or manual view can help you to determine and decide on a good candidate for automation. To save your selections before you toggle off a view to another view, click **Save view**. The changes are saved across the **Dashboard**, **Aggregated**, and **Comparison** tabs. If you do not save your changes, the filter resets. You must re-select and apply your options again. For a manual view, you must re-select your filter options to create an opportunity. Click **Filter** and select from the following options:

The **Filter** window displays the following:

Option	Action
Path: With the most common flow	Select this option when you want to see what paths have the most common variance of a process that is being used. If you choose to automate this type of path, you will have a higher return on your investment.
Path: With the most deviations	Select this option when you want to see certain sections of the process that have a different deviation in the path. The automation priority for such paths are usually low.
Path: With the most repetitive flow	Select this option when you want to display sections of the process that are more repetitive and cost more. The automation priority for such paths are usually high.
Step: Application	Select the <b>Application</b> option when you want to see the application type used during the recording. Use this option to see which applications are more frequently used, and to decide on which applications should be a priority.
Step: Action Type	Select the <b>Action type</b> option to filter the process steps to display only particular actions that will help you get an idea how the steps are used.
Clear	Select <b>Clear</b> to clear all selected options.
Reset	Select <b>Reset</b> to reset to the previous saved state of the filters in a view.

Option	Action
Apply	Select <b>Apply</b> to apply the selected options for display from the <b>Aggregated</b> tab for the system generated view or manual view.

- g) Select the **Toggle frequency counter** option to display the number of recordings that a particular path takes in the flow in a system generated view. Use this option to help you understand the frequency of the path as compared to other recordings or views. This option can only be used for system generated views. In the **Recordings** table, select two or more recordings and the **Toggle frequency counter** displays two at the start of the process flow to indicate the number of recordings selected. If each recording takes a different path, the process flow is divided between the total number of recordings selected and displays accordingly. For example, if there are ten recordings in a view and three paths displayed. Two recordings follow one path, two recordings follow the second path, and six recordings follow the third path. Along the path flow, you will see two, two, and six. If a step is merged, the number gets added between the two paths. Use the thick or thinness of the path to help you prioritize processes for automation. The most commonly used path is the thickest path and this can be useful for prioritizing a process when reviewing many recordings. For example, if there are 5 paths for 20 recordings, you will quickly see which is the thickest and consider automating this path. If you have additional bandwidth to automate another path, you can drill down in the flow and look at the numbers to see what path is next as a possible candidate for automation.

- h) Mouse over the actions menu option in the **Views** table to copy, convert to manual, or delete a view.

The menu option is the vertical ellipsis (three dots). The vertical ellipsis only shows if the row level menu is hidden. You can configure the menu option to display as you want using the **Customize columns** icon. The menu option allows you to select from one of the following:

Option	Action
<b>Copy</b>	Select <b>Copy</b> to create a copy of the view. The newly created copied view is displayed in the <b>Aggregated</b> view and saved in the <b>Views</b> table with a new ID.
<b>Convert to Manual</b>	Select <b>Convert to Manual</b> to convert the system generated view to a manual view. This option allows you to add more recordings or steps from other recordings using the <b>Edit</b> option. Repeat steps 2a and 2b. Click <b>Save</b> . In the <b>Views</b> table, the manual view is indicated by the definition icon in the <b>Type</b> column. The newly created manual view is displayed in the <b>Aggregated</b> view main screen. In the <b>Recordings</b> table, the check box is selected to indicate the recordings already included in the view.
<b>Edit</b>	Select <b>Edit</b> to add recordings or steps from other recordings from the <b>Recordings</b> table.
<b>Delete</b>	Select <b>Delete</b> to delete the view. The underlying recordings used in the view are not impacted by the deletion of the view.

3. Create a new view from selected recordings, or select a manual view to add more steps from another recording to the process view. Create a branch, and merge steps from one or more recordings into the branch. Create opportunities.

In this example, a branch is created for reviewing the credit score for a bank loan.

- a) Click **Create view** or select a manual view from the **Views** table.
- b) Mouse over the row level menu in the **Views** table and click **Edit**.
- c) Mouse over the row level menu in the **Recordings** table and click the + sign to select a recording to display in the manual view.

The selected recording is displayed in new feeder canvas to the right of the main canvas in the **Aggregated** view.

Click on the individual step to display details about the step in the **View details** window on the right of the **Aggregated** view. The information is displayed in the following order:

Field	Description
Copy of	The copy of the view (view ID) that the view is copied from. The view ID is in shown in the <b>Views</b> table.
List of recordings	The list of recording(s) that are used in this view.
View name	The name of the view created.
Description	The description entered when you create a view.

- d) Click the branch icon in **Aggregated** workflow.

Click the branch icon to add a condition step into the view. Move the subsequent step into a branch on the left and adding a new branch to the right in the empty branch are to receive steps from another recording. In the upper-right corner of the yellow box, click the three dots to create a new branch or delete a branch. The branch endpoint is displayed with a small circle.

By default, you can move the branch endpoint lower in the path flow to include more than one step. To move the branch endpoint, press down with the cursor on the endpoint until you see the dotted lines appear around the branches. Drag the endpoint downward in the path flow. Place

the endpoint when you see the dotted lines appear between the arrow. The endpoint is shifted downwards in the path flow and includes more steps.

---

**Note:** Moving the branch endpoint up in the branch is now supported.

---

- e) Click the **Condition** field at the node level.
- f) In the **Condition** field, enter a name for the condition. Example, `credit score`.
- g) Click the check mark to save the name for the condition.
- h) Open the respective branches on the right and left and set a value for the condition. For example, enter less than 200 on the right and greater than 700 on the left.
- i) Drag and drop steps from the recording in the feeder canvas into the receiver step that reads `Drag items here` of the branch in the main canvas.  
Use the Shift key to select one or more steps to drag into the receiver step. To clear a condition in the branch, click the three dots. Select **Clear branch**.
- j) Repeat the steps c through h to create additional branches and merge steps into the branch.
- k) Click **Save** to save the view and exit the **Edit** mode.
- l) Repeat steps a through j to create additional views and branches, as needed.

The view or recording that is visible in the main canvas is displayed in bold in the respective **Views or Recordings** table.

You can click the X (close) sign to exit the mode. Click **Dismiss Changes** to not save the view. All the selected steps will be deleted. This message is only shown when there are unsaved changes.

- m) Select the check box next to the steps in the view and create opportunities.  
Selecting the check box next to the condition box will select all the branches and the associated step into the opportunity.  
The **Opportunity details** tab appears.
- n) Fill in the necessary opportunity details and click **Create Opportunity**.

### *Review opportunities and convert to bot*

You are now ready to review and finalize on your potential opportunities. Convert an opportunity to a bot. You can export the data to a Word document for your reference.

## Review opportunities and convert to bot

Review potential system generated opportunities, create a manual opportunity from a system generated opportunity, and convert them to bots. You can also export the opportunity data to a Word document.

Automation opportunities are separated into two types of opportunities; system generated and manual opportunities. System generated opportunities, also known as auto-generated opportunities, are created when at least two recordings are approved by the user. The auto-generated opportunities are available immediately for you to begin analyzing from the **Opportunities** page. The **Download PDD** option is not available for auto-generated opportunities.

Manual opportunities, also known as custom opportunities, are created when you select a view or a recording and the associated steps to create an opportunity from the Aggregated view of the **Processes** tab. You can also create a custom opportunity from an auto-generated opportunity from the **View**

**opportunities** page to further analyze and review the benefits and savings of the opportunity with or without automation, as you look to build your investment in automation.

- This task is performed by the Discovery Bot analyst who is in charge of reviewing and analyzing the associated recordings of business processes.
- Ensure the analyst is assigned a Process analyzer license and the **AAE\_Discovery Bot Analyst** role before processes are analyzed.

*Supported licenses for Discovery Bot*

- Ensure the analyst is assigned a Bot Creator license to convert opportunities to bots.

*Supported licenses for Discovery Bot*

**1.** Review the data in the **Opportunities** tab:

- From your local machine, log in to your Control Room as Discovery Bot analyst.
- Go to **Discovery Bot > Opportunities**.

The **Opportunities** page displays all the opportunities you have created. You can configure the menu option to display as you want using the **Customize columns** icon. The table lists the following information:

Field	Description
Opportunity name	The name created for the opportunity. To identify an auto-generated opportunity from a custom opportunity, the auto-generated opportunity begins with the name of the process hyphen OPPORTUNITY.
Process name	The name created for the process.
Type	The type of opportunity created for a process. The type can be Auto or Custom.
Path	The type of path specified based on the <b>Model</b> and <b>Filter</b> options applied to the opportunity. Auto-generated opportunities use default values of Model - Easy and Filter - Most common path.
Date created	When the opportunity was created.
Date modified	The date the opportunity is modified by the analyst. The modified date can occur when a opportunity is updated or when a custom opportunity is created.
Owner	The name of the process owner. The process owner can be system or analyst.
# of recordings	The number of recordings for a process associated with the opportunity.
# of applications	The number of applications used in a recording session associated with the opportunity.

Field	Description
Process cycle	The duration of the recording session associated with the opportunity.
# of users	The number of users who participated in the recording session for that process.
Cost without automation	The formula used to calculate the cost of the opportunity without automation. Use the formula to help you decide which opportunities to prioritize for your business development based on ROI, applications used, number of users, and so on. The formula is calculated by taking the number of users multiplied by the total hourly pay of number of users multiplied by the average process cycle.
Savings	The potential savings associated with this opportunity when automation is used. The formula is calculated by taking the number of users multiplied by the total hourly pay of number of users multiplied by the average process cycle.
Priority	The priority level assigned to the opportunity. The priority can be one of the following: <ul style="list-style-type: none"> <li>• Low</li> <li>• Medium</li> <li>• High</li> </ul>
Bot created	The bot created for an opportunity. This can be Yes or No. The <b>Convert to bot</b> option is not available for auto-generated opportunities. The <b>Convert to bot</b> option is available for custom opportunities only.
Savings	The potential savings associated with the opportunity (this could have been specified as a yearly savings or savings per run).

Field	Description
PDD	Click <b>Download PDD</b> to export and download the opportunity data into a Process Definition Document (PDD) Word document for custom opportunities. The <b>Download PDD</b> not is available for auto-generated opportunities. The PDD column displays N/A for auto-generated opportunities. The <b>Download PDD</b> option is also available from the <b>View opportunity</b> page.

- c) Select the required opportunity by sorting, searching, or both from the table using the **Search** field.
- d) Select an opportunity from the table.  
The **View opportunity** page is displayed. The **Dashboard** and **Aggregated** views are available to review the opportunity details.

---

**Note:** Depending on the type of opportunity you selected (Auto or Custom) from the table, the **Details** window will display a different set of fields for you to enter if required.

---

2. Optional. Create another opportunity from this custom opportunity, if required:
  - a) Click the **Aggregated** tab.
  - b) Select the **Select all steps** check box to the left of the step to create a new opportunity.  
Based on your requirements, use the shift key to customize the number of steps within a path from the main canvas.
  - c) Optional. Use the Filter option to customize a specific opportunity.
  - d) Enter the fields in the **Opportunity details** tab.
  - e) Click **Create opportunity** to save the new opportunity.  
The opportunity is saved in the **Opportunities** table.

3. Optional. Create a custom opportunity from the auto-generated opportunity.
  - a) Click the **Aggregated** tab.
  - b) Select the **Unselect all steps** check box from the **Details** window to create a new custom opportunity.  
Based on your requirements, use the shift key to customize the number of steps within a path from the main canvas.
  - c) Optional. Use the Model and Filter options to customize a specific opportunity.
  - d) Enter a name for the opportunity.
  - e) Enter the number of business users involved in the recording session for an assigned process.
  - f) Enter the estimated cost of the process without automation.
  - g) Enter the potential savings associated with the process when automation is used.
  - h) Select the priority from the drop-down list.
  - i) Click **Save as custom** to save the opportunity as a custom opportunity.  
The opportunity is saved in the **Opportunities** table.
  - j) Click **Revert** to undo your changes entered in the fields.
  - k) Optional. Repeat steps 2b through d to create another opportunity, if required.
  - l) Optional. Click on an individual step in the canvas to display details about the step in the **Preview** window.

4. Convert to bot:

- a) Click the **Convert to bot** option.
- b) Enter a bot name.
- c) Optional: Enter a description.
- d) Click **Browse** and accept the default folder location `\Bots\`.  
To change the location where your bot is stored, drill down to the folder in which you want to save the bot.
- e) Click **Confirm**.
- f) Click **Convert**.  
A message window appears notifying you that the bot has started to convert. You will receive an email when the bot is converted successfully. Click the hyperlink in the email to take you to your folder in which the bot was generated.

---

**Note:** In the **My bots** tab, the converted bot displays an error, with 0 byte size while the bot creation is in process. Avoid opening the bot until the bot conversion is complete.

---

The **Convert to bot** option is only available if you have the Bot Creator license. To review the created bot you must have the **AAE\_Basic** role assigned.

5. Click the **Download PDD** option to export the opportunity data into a Process Definition Document (PDD) Word document with the same name as the opportunity.

When an opportunity is created, the PDD begins processing in the background automatically. When the PDD is done generating, the field changes from generating PDD to **Download PDD**. You can now download the document. An email notification to the opportunity owner is also sent to the email

address on file. You can also download the PDD for that opportunity from the **Opportunities** page. If you receive an error downloading the PDD, click **Download PDD** again to re-generate the PDD.

**Note:** The **Download PDD** option is disabled if you are not the owner of the opportunity. You must be the owner of the opportunity to be able to download the PDD.

The document is saved in the folder on your machine that is configured for downloads in your browser.

## Using IQ Bot for intelligent document processing

IQ Bot is the only web-based, cloud-native intelligent document processing solution that business users can easily set up to automatically read and process a variety of complex documents quickly. This version has limited features and is offered to users as a free Community Edition version.

### How to use Community Edition

**Important:** This new Community Edition includes a preview of IQ Bot with Auto-extraction.

Community Edition is a special version of our product in the Cloud, available for all users who want to try RPA, and IQ Bot at no cost. Users are not required to purchase a license, and there are no time limitations. However, there are some functionality constraints as follows:

- You can create up to a maximum of five learning instances per user.
- In the learning instance list, you can view and access learning instances and data created by you only.
- You can process up to a 100 pages per month for each user account.

To begin using the new Community Edition version:

1. Select the Community Edition URL you received in your email and click the **Open IQ Bot** option.
2. In the IQ Bot **Learning Instances** page, choose an option to create learning instances:

Options	Create learning instances	Type of learning instances
<b>Option 1:</b>	Click the <b>Create Learning Instance</b> option.	Create learning instances using IQ Bot with Auto-extraction Invoices.  <i><a href="#">Create a learning instance in Automation 360 IQ Bot</a></i>
<b>Option 2:</b>	Click the <b>Train other documents</b> option.	Create and train learning instances for other document types using IQ Bot.  <i><a href="#">IQ Bot Community Edition quick start guide</a></i>

*Automation Anywhere Community Edition* now offers a unified UI experience for IQ Bot. Users can perform the following tasks by navigating to **Control Room > IQ Bot**:

1. Create a learning instance.
2. Process documents to extract data for invoices, with predefined form and table fields.

3. Validate failed documents manually by using the Validator form.
4. View learning instance dashboard metrics that are integrated with Bot Insight.

## Create a learning instance in Automation 360 IQ Bot

Create a learning instance using IQ Bot Auto-extraction invoice (document type) to process and validate your documents. For this release, users can process invoices in English.

IQ Bot provides you with a predefined set of form and table fields as follows:

Form fields	Table fields (columns)
Invoice number	Unit price
Invoice date	Quantity
Purchase Order number	Description
Shipping address	Total price
Billing address	-
Total amount	-

1. Navigate to **Control Room > IQ Bot > Learning Instances > Create Learning Instance**.
2. Provide a name and an output folder path.  
The system creates the `Output` folder on your machine when the document extraction bot is executed.  
The learning instance appears on the **IQ Bot > Learning Instances** dashboard.  
Users can create up to five learning instances. After that, the system displays a message stating the limitation.
3. To delete a learning instance, click the ellipsis next to the learning instance and select the delete action.
4. Navigate to **Control Room > IQ Bot > Learning Instances > Train other documents** to view the legacy version of IQ Bot Community Edition.

Create a bot to process your documents.

## Requirements for creating a learning instance in IQ Bot Community Edition

Before you begin using Community Edition, review the system requirements and settings.

### System requirements

Ensure you have completed the following requirements:

- Users require a minimum hardware of 4 CPU cores and 8 GB RAM.

---

**Note:** This requirement is for the Bot Runner.

---

- Use the supported document formats:
  - Digital PDF
  - JPEG
  - JPG
  - PNG
- See Bot agent system requirements: [Bot agent compatibility](#).

## Prerequisites

Complete the following prerequisites to start using IQ Bot Community Edition:

- Install [Microsoft Visual C++ latest supported downloads](#) from Microsoft Visual Basic C++ Studio 2015, 2017, and 2019 section, on the Bot Runner.
- [Install Bot agent and register device](#)

## IQ Bot standard forms

Standard forms are one of the document types in Automation 360 IQ Bot that enables you to create a learning instance for content extraction.

---

**Note:** Standard forms are currently available only as a beta feature.

---

Standard forms are used to extract a large number of data fields from fixed-format type documents that typically have a few or no variations in the layout. An ideal scenario for using standard forms is when you want to process a large number of documents with an identical format and layout, such as legal documents, for example, tax forms, mortgage forms and ID proofs. These documents have standard layouts with very little variation.

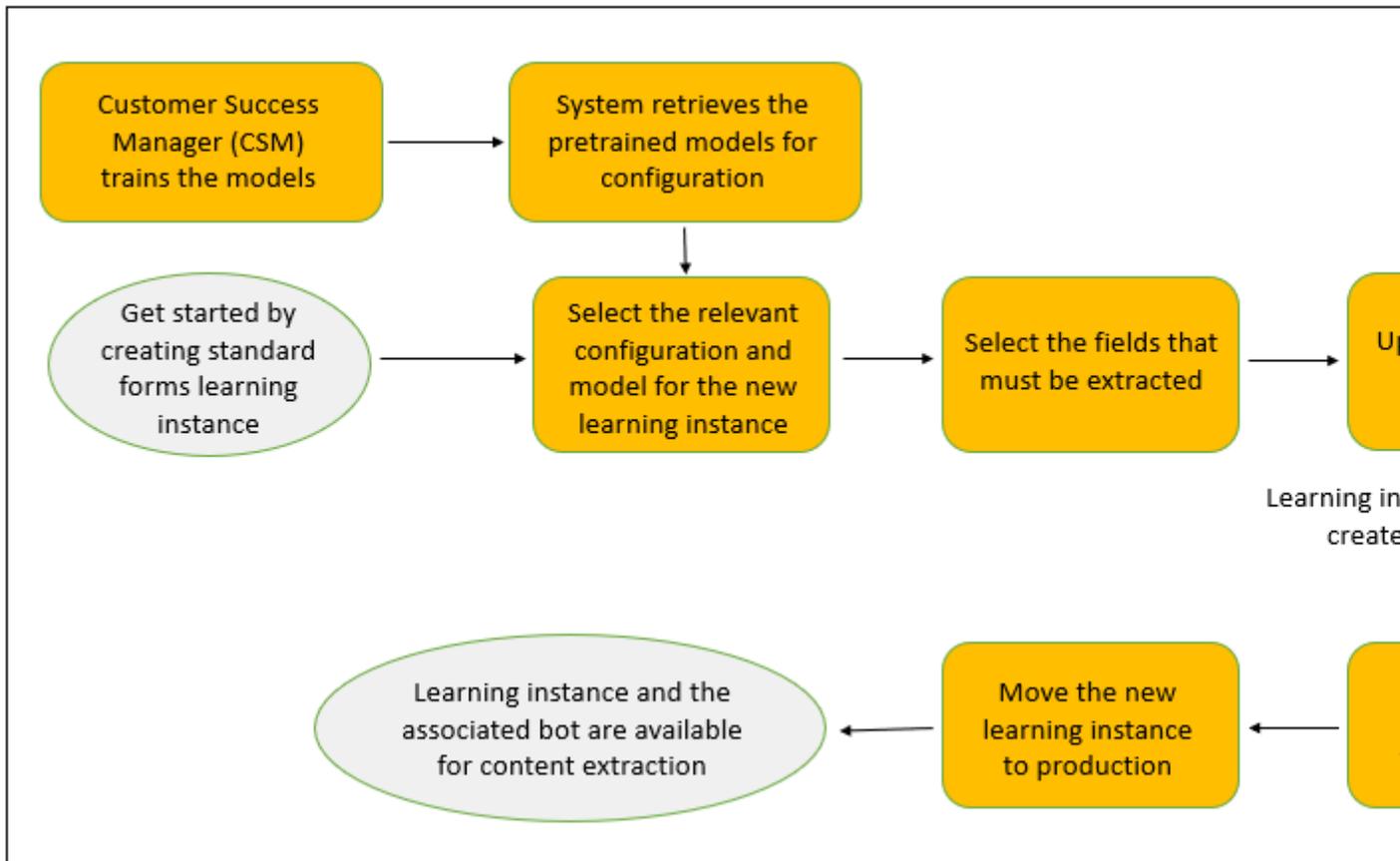
Here are some of the benefits of using standard forms:

- Document training not required while creating learning instances
- Enhanced accuracy in content extraction with pretrained model
- Less time taken to set up a learning instance
- Flexibility to edit or add validation rules for existing learning instances
- Integrated into the existing IQ Bot platform
- Support for using Python script for post-processing

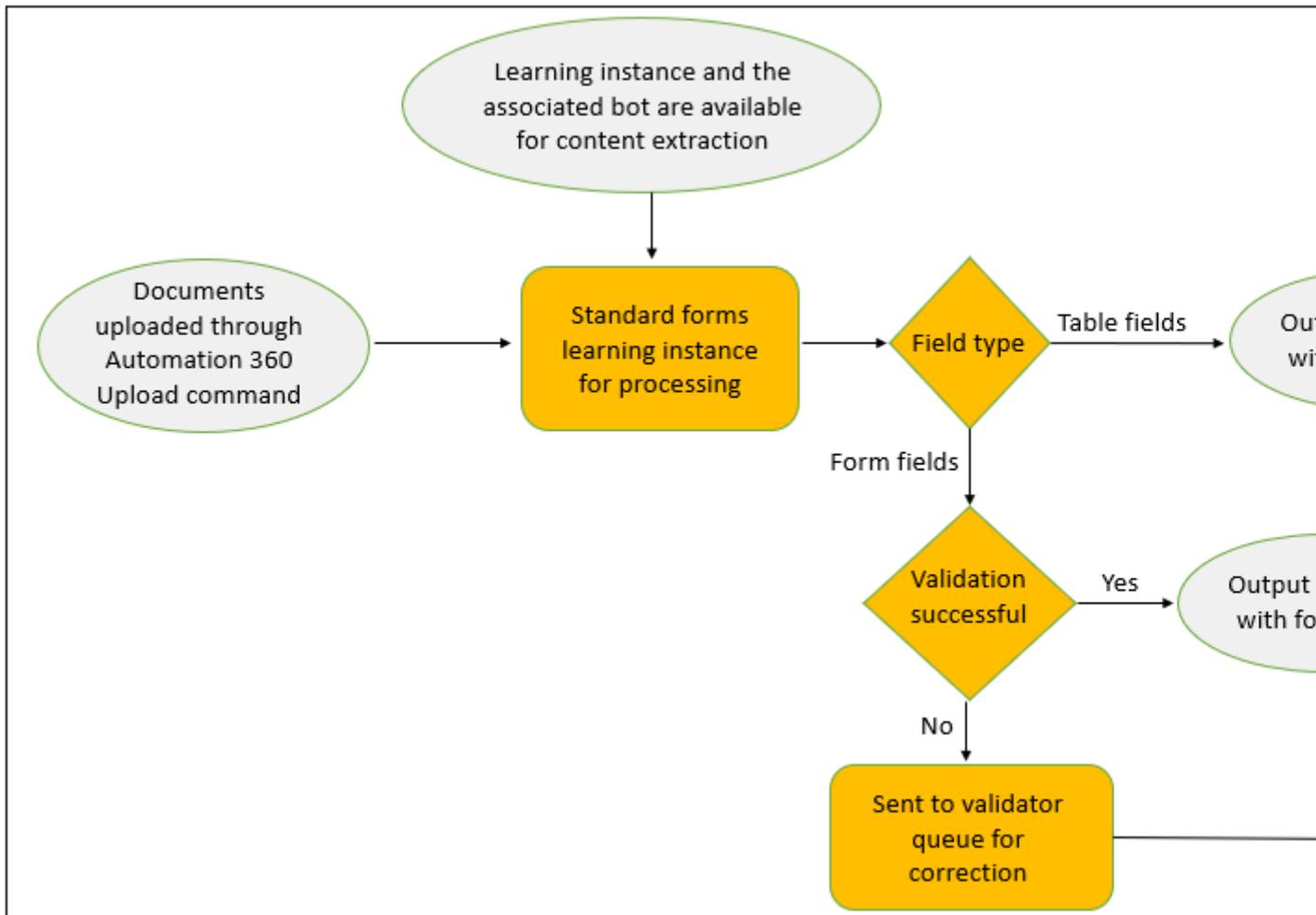
IQ Bot is optimized to learn and extract content from documents that have varied layouts and structure and low density of information—not more than a few dozen fields.

If you create a learning instance by using standard forms, supported configurations and the corresponding pretrained model are available in IQ Bot, which enables you to skip the document training in Designer. You can create a learning instance by selecting an existing model (such as Microsoft form model) and the necessary fields that must be extracted.

The following image illustrates the process of creating a learning instance by using standard forms:



The following image illustrates the process of content extraction by using a learning instance created with standard forms:



## Create Azure Form Recognizer and Storage

Azure Form Recognizer is a part of Azure Applied AI Services. The Azure Storage platform is Microsoft's cloud storage solution for modern data storage scenarios. It is necessary to configure these two services to use IQ Bot standard forms.

Contact your Customer Success Manager (CSM) or Partner Enablement Manager (PEM) for the following:

- Azure Form Recognizer Endpoint
- Azure Form Recognizer API Key
- Storage Blob URL to Upload Training Documents
- Storage Blob SAS Link to Connect to Forms Recogniser

Azure Form Recognizer lets you build automated data processing software by using machine learning technology. An Azure subscription, a Form Recognizer resource endpoint, and API key are necessary to configure the Form Recognizer service. You can call Form Recognizer models by using a REST API or client library SDKs to reduce complexity. The Form Recognizer model can then be integrated into your workflow or application.

Form Recognizer includes the following components:

- Custom document processing models
- Prebuilt models for invoices
- Receipts

- IDs and business cards
- Layout model

Azure Storage services offer a scalable object store for data objects, disk storage for Azure virtual machines (VMs), and a file system service for the cloud. The Azure Storage platform includes the data services such as:

- Azure Blobs
- Azure files
- Azure Tables
- Azure Queues
- Azure Disks.

## Set up standard forms

API URL, a API key, and the Microsoft Azure Storage resource are required for configuring standard forms in IQ Bot. Contact your Customer Success Manager (CSM) or Partner Enablement Manager (PEM) to help you setup the standard forms.

## Create Azure Form Recognizer model

Azure Form Recognizer model is a representation of data used as a reference for analyzing specific content. The model enables you to create a form (such as a survey) which can then be used to review results in real time, and export results to Microsoft Excel for additional analysis.

After creating a new model, ensure you test it thoroughly before integrating it with IQ Bot, as any update or changes to a model at a later stage requires you to create a new learning instance.

Review the following considerations in IQ Bot:

- Only single or Form fields are considered by the validator.
- Table fields trained on Azure Form Recognizer are ignored.
- Auto-detected tables on Azure Form Recognizer results in auto-generated `JSON` and `CSV` files.

Use the following instructions to create a model that enables you to set up and configure standard forms in IQ Bot:

1. Log in to [Azure portal](#).
2. Upload your staging documents to Microsoft Azure blob container.  
A minimum of five documents of the corresponding document type are required.
3. Create a connection and enter the generated SAS link in the **SAS URL\*** field.
4. Create a custom project.
5. Enter the **Form recognizer service URL**, **API key**, and **API version** in the **Project Settings** screen.
6. Train and label the desired document type.

You can train your model with or without labeled data sets. Labeled datasets require Layout API along with human input, such as specific field locations. However, datasets without labels only rely on the Layout API to detect and identify key information. See [Train custom model](#).

7. Click **Create**.  
A model for the selected training is created.

## Configure standard forms in IQ Bot

After you have created a model for the selected training using a form (such as Microsoft form), you can use that model to set up and configure standard forms in IQ Bot.

Use any console window (such as PowerShell, Postman, CURL, or Bash) to add a standard forms API and the required configurations in IQ Bot.

1. Use a console window to access the following IQ Bot Server API:

```
<CR-hostname>/IQBot/gateway/providers/{provider-name}/config/"
```

2. Update the following settings:

```
Method: POST 3
Param: 4
provider-name: 5
Header: 6
X-authorization: 7
consumes: application/json
```

3. Update the provider configuration.

For example, review the following sample form configurations:

```
{
  "name": "MSFormConfig",
  "apiEndPoint": "https://msformrecog.cognitiveservices.azure.com/",
  "apiKey": "xxxxxxxxxxxxxxxxxxxxxxxxxxxx",
  "providerVersion": "v2.1",
  "languages": [
    "English"
  ]
}
```

4. Close the console window.  
Data is stored on the server that is accessed by IQ Bot Database.

## Create a learning instance by using standard forms

Learning instance is an environment that enables you to extract content from documents. You can create a learning instance by using standard forms when the documents from where content must be extracted have similar layouts.

Create a learning instance using standard forms when you have documents with fixed-format type that typically have few or no variations in the layout. For example, law firms can have numerous clients, but the structure and layout of a mortgage form remains identical.

Use the following instructions to create a learning instance using standard forms:

1. On the **My learning instances** page, click **New instance**.
2. In the **General information > Instance name** tab, enter a name for the new learning instance.
3. From the **Document type** drop-down menu select **Standard Forms**.
4. In the **Standard form settings** tab, from the **Provider name** drop-down menu, select a provider for processing the form.
5. From the **Configuration type** drop-down menu, select the supported configuration.  
This enables you to connect to one of the provider services configured during installation.
6. From the **Select Model** drop-down menu, select a pre-trained model for the selected configuration.

7. Click **Browse** to upload a reference document.

For example, if you have selected the configuration type and model as invoice, you can upload an invoice file that must be analyzed.

8. From the **Fields to extract** tab, select the fields from where the values must be extracted.

The fields are displayed based on the selected Form set in the pre-trained model, and no additional fields can be added.

9. Click **Create instance and analyze**.

The system analyzes and sorts the document into logical group.

---

**Note:** Only one default group is created. The system-identified region (SIR) are not visible and all the training related fields are greyed out. You can only add validation patterns and custom logic.

---

10. Optional: In the **Fields** tab, select a field and click **Field options**.

The **Field options** enables you to customize the **Validate Pattern** options.

11. Click **Save and close**.

A new learning instance is created. You can choose to either save the trained learning instance only on staging or send it to production.

## Edit a standard forms learning instance

As the learning instances created by using standard forms have pre-set configurations, you can edit only the name and the description. Also, you cannot edit instances in the production environment without moving them to staging.

The classify option is not available in standard forms as the document classification is pre-configured.

1. On the **My learning instances** page, select the learning instance you want to edit.

You can also use the **Search** bar to locate the learning instance.

2. Click **Edit**.

3. Edit the name of the learning instance in the **Instance name** field.

The document classification options are not available as the standard forms use a pre-trained model and configurations.

4. Optional: Use the **Document Groups** tab to review the groups associated with the learning instance.

5. Optional: Click the **Summary** tab to review the learning instance.

Standard Forms details such as **Provider**, **Configuration**, and **Model** are available under this tab.

6. Click **Save**.

Changes made to the learning instance are updated on staging.

## Edit a bot in standard forms

To prevent wrong or invalid data extraction, you can edit the bot associated with any standard forms learning instance and customize the validation rules.

You can only edit a bot on staging. So ensure that you move a bot in production to staging.

1. On the **Bot** page, select the bot you want to edit.

You can also use the **Search** bar to locate the bot.

2. Click the **Edit Bot** icon for the bot.

3. In the **Field** column, click **Field options**.

4. Enter any custom validation rules in the fields under the **Validate Pattern** tab.

Documents that are not processed are moved to the **Validator**, and fields with errors are flagged. You can review the flagged fields in the Validator.

#### *IQ Bot Validator*

5. Optional: Enter post processing logic under the **Logic** tab, and click **Save**.
6. Click **Save**.  
The updated bot is saved on staging and you can move it to production.

## Export a standard forms learning instance

Export your existing standard forms learning instance, as it can be used across similar IQ Bot environments.

IQ Bot administrator can use the following instructions to edit a standard forms learning instance:

1. Click **Administration > Migration**.
2. Click **Create Backup**.

Backing up your existing learning instance enables you to save and restore the configuration if required.

3. Select the learning instances that you want to back up and then click **Backup**.
4. Enter a name for the IQ Bot archive (IQBA) file.

The name of the archive file is appended with a time stamp to make it unique. You can download this file and export it to the target environment.

5. Click **Backup** to begin the export process.  
The exported data file with the `.iqba` extension is available in the `BackupData` folder in your IQ Bot output directory.

## Import a standard forms learning instance

Import an existing learning instance from a similar environment to avoid creating learning instances and associated bots multiple times. Use the Automation 360 IQ Bot Migration Utility feature to import any standard forms learning instances.

Before importing a standard forms learning instance, ensure that you have set up the standard forms API and configurations in IQ Bot. See [Configure standard forms in IQ Bot](#).

When you export an `.iqba` file, only a single document associated with every available bot (Group) training is exported.

1. Log in to IQ Bot as an administrator.
2. Click **Administration > Migration**.  
A list of backed-up learning instances is displayed.
3. Click the **Import** icon under the **Actions** tab for the selected learning instance.
4. Select the import method, and click **Accept**.  
The selected standard forms learning instance is imported.

## Extract information from documents

After you complete creating a learning instance, create a bot to extract fields from the documents using the learning instance you created.

Create a learning instance before you create a bot.

Create a bot, and then use the **IQ Bot (Preview) > Document Extraction** action to process your documents and extract data . Users can upload multi-page PDF documents for data extraction.

---

**Note:** IQ Bot uses the ABBYY FineReader Engine for OCR.

---

1. Go to **Bots > My bots** and click **Create a bot**.
2. In the **Create Task Bot** window, enter a name and click **Create & edit**.
3. The bot designer window appears.
4. In the **Edit Task Bot > Actions** column, search for IQ Bot to display the available actions.
5. Drag the **IQ Bot (Preview) > Document Extraction** action into your workflow.
6. In the **Input File Path** field, use **Browse** to navigate to the file you want to process.
7. From the **Learning Instance that will process the document** drop-down list, select your learning instance.
8. **Optional:** In the **Save response code to variable (optional)** field, select **prompt-assignment – String** from the drop-down list.  
The action response code is saved in the provided variable.
9. **Optional:** Drag the **Message box** action to display results in the message box. Define the message you want to see displayed in the message box.
  - a) Click the **Insert a value (F2)** icon in the **Enter the message to display** field.
  - b) In the **Insert a value** dialog box, select **prompt-assignment - String** from the drop-down list and click **Yes, insert**.
10. Click **Save** and then click **Run** to run the bot.

If all the fields are extracted and the value has a high confidence, the system sends the data to the `Success` folder. The status of the data extraction is updated in Bot Insight and is reflected in the **Learning Instance** page.

After document processing is complete, IQ Bot sends successfully extracted data to the output folder, specified during learning instance creation, and the `Success` subfolder for successfully processed documents; while failed documents are sent to a different folder for validation.

---

**Note:** The outputs are in the JSON format.

---

The extracted files are sent to the output folder you previously configured as a prerequisite step:

- Go to the `Output\Success` folder on your machine to view the successfully extracted data.
- Go to the `Output\Data` folder and the `Output\Meta` folder on your machine to view information about the failed documents requiring validation.
- Go to the `Output\Unprocessed` folder on your machine to view the documents not extracted by the **Document Extraction** action.

Based on the extraction results the **IQ Bot > Learning Instance** dashboard displays the updated STP (straight-through processing), total number of uploaded documents, and the number of documents pending review.

## Validate documents

This is the final phase of the process where you manually validate error value fields in each document in the validation queue.

1. To validate the failed documents, navigate to **IQ Bot > Learning Instances** and click the **Review documents** option next to the learning instance.  
The Validator form appears with the first failed document in queue.
2. Update the error fields manually.
  - One file (.CSV) is generated for the form fields.
  - One JSON file and an additional CSV file for each of the auto-detected tables.
3. During table validation, add or delete rows if required.
  - a) Click the ellipsis next to a row to see the allowed actions.
  - b) Add any number of rows, and enter the values in the cells.  
You will not be able to add new rows after you delete all the rows from a table. Remember to create a new row first before deleting all unwanted rows.
4. After you complete the corrections, select **Submit** to complete validating the current document.  
After validation, the updated value results are sent to the `Success` folder.

The Validator shows the next document in queue.

When all documents are corrected, the system displays a message stating that there are no more documents available for validation.

## Preprocessing error messages

If you encounter any preprocessing errors, review the cause and perform the required action to resolve the error.

Cause	Action required
A mismatch occurred and we didn't find the expected variable data type.	Use an inline expression or a separate action to convert to the correct variable data type.  <a href="#">Variables overview</a>
A "\$" is being read as a variable but no such variable exists.	Use "\$\$" to escape the dollar sign and try again.
The bot is calling another bot, but we didn't find the child bot at the specified location.	Check the path and try again.
We found a Catch action that is not contained by a Try action.	Ensure that each Catch action is contained by a Try action.
We found a Try action that does not contain a Catch action. Each Try action requires at least one Catch action inside it.	Ensure that each Try action contains a Catch action.

## Build advanced bots and packages

Learn how to build action packages and advanced bots that include custom features such as scripting, and API calls. Find recommendations on bot and action package design and reusability.

### More resources

On the [Developer portal](#), find additional how-to tutorials on building advanced bots and packages.

## Package Software Development Kit (SDK)

Review the requirements and process for creating and uploading an action package to your Control Room.

Packages are Java Archive (JAR) files containing the executable third-party applications used to create bots. Actions are available in the Control Room under the **Action Panel**.

The Automation Anywhere Package Development Kit provides detailed instructions for users to independently develop custom actions and upload and manage packages in their Control Room.

The SDK includes sample code and supporting files for Java developers to create and validate custom actions.

*June 2021, Release (A2019.21)*

*A2019-package-sdk-2.1.0.zip*

*April 2021, Release (A2019.20)*

*A2019-package-sdk-2.0.9.zip*

*February 2021, Release (A2019.19)*

*A2019-package-sdk-2.0.8.zip*

*January 2021, Release (A2019.18)*

*A2019-package-sdk-2.0.7.zip*

*November 2020, Release (A2019.17)*

*A2019-package-sdk-2.0.6.zip*

*September 2020, Release (A2019.16)*

*A2019-package-sdk-2.0.5.zip*

*August 2020, Release (A2019.15)*

*A2019-package-sdk-2.0.4.zip*

*July 2020, Release (A2019.14)*

*A2019-package-sdk-2.0.3.zip*

*May 2020, Release (A2019.13)*

*A2019-package-sdk-2.0.2.zip*

*April 2020, Release (2019.12.1)*

*A2019-package-sdk-2.0.1.zip*

*April 2020, Release (2019.12)*

*A2019-package-sdk-2.0.0.zip*

*March 2020, Release (2019.11)*

*A2019-package-sdk-1.0.11.zip*

*February 2020, Release (A2019.10)*

*A2019.10-package-sdk-1.0.0.zip*

***January 2020, Release (A2019.09)***

- SDK Demo Package: ***A2019.09-packageSDK-1.0.0.zip***
- Documentation: ***A2019.09-package-annotations-javadoc.zip***

*November 2019 Release (A2019.08)*

- SDK Demo Package: ***A2019.08-packageSDK-1.0.0.zip***
- Documentation: ***A2019.08-package-annotqtions-javadoc.zip***

**October 2019 Release (A2019.07)**

- SDK Demo Package: [A2019.07-Package-Sdk-1.0.0.zip](#)
- Documentation: [A2019.07-package-annotations-javadoc.zip](#)

For detailed release notes for the SDK Packages, see [Automation 360 Package Development Kit Release Notes](#).

Click a title to read details about each task in the process.

[Set up the Java project](#)

Set up an integrated development environment (IDE) for Java, including Automation Anywhere custom annotations to develop an action package that you can upload to your Control Room.

[Standard coding practices and guidelines for developing packages](#)

This topic covers standard coding practices and guidelines that help to ensure the development of high quality packages.

[Develop a sample package](#)

Develop your own package and upload it to an Control Room to provide custom actions for bots.

[How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

[Annotations](#)

This section provides reference information about the annotations used to create Automation Anywhere packages.

[Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

[Build and test a custom package](#)

Use IntelliJ to build a custom package and use Automation 360 actions to test the package.

**Related reference**[Automation 360 Package Development Kit Release Notes](#)

These release notes describe new, changed, fixed, deprecated features, and security fixes, as well as known issues and limitations for the Automation 360 Package Development Kit.

## Set up the Java project

Set up an integrated development environment (IDE) for Java, including Automation Anywhere custom annotations to develop an action package that you can upload to your Control Room.

A working knowledge of Java and Gradle is required in order to successfully build an action package. You require the following software and file:

- Java Developer Kit (JDK) 11
- Java IDE
  - [Eclipse](#)
  - [Community edition of IntelliJ](#)
- Gradle plug-in v.5.\*.\* in the IDE

- Automation Anywhere Bot agent installed and connected to your Control Room **Download and extract a zip file**

Download and extract the zip file for the release you want:

<i>June 2021, Release (A2019.21)</i>	<i>A2019-package-sdk-2.1.0.zip</i>
<i>April 2021, Release (A2019.20)</i>	<i>A2019-package-sdk-2.0.9.zip</i>
<i>February 2021, Release (A2019.19)</i>	<i>A2019-package-sdk-2.0.8.zip</i>
<i>January 2021, Release (A2019.18)</i>	<i>A2019-package-sdk-2.0.7.zip</i>
<i>November 2020, Release (A2019.17)</i>	<i>A2019-package-sdk-2.0.6.zip</i>
<i>September 2020, Release (A2019.16)</i>	<i>A2019-package-sdk-2.0.5.zip</i>
<i>August 2020, Release (A2019.15)</i>	<i>A2019-package-sdk-2.0.4.zip</i>
<i>July 2020, Release (A2019.14)</i>	<i>A2019-package-sdk-2.0.3.zip</i>
<i>May 2020, Release (A2019.13)</i>	<i>A2019-package-sdk-2.0.2.zip</i>
<i>April 2020, Release (2019.12.1)</i>	<i>A2019-package-sdk-2.0.1.zip</i>
<i>April 2020, Release (2019.12)</i>	<i>A2019-package-sdk-2.0.0.zip</i>
<i>March 2020, Release (2019.11)</i>	<i>A2019-package-sdk-1.0.11.zip</i>
<i>February 2020, Release (A2019.10)</i>	<i>A2019.10-package-sdk-1.0.0.zip</i>
<b><i>January 2020, Release (A2019.09)</i></b>	<ul style="list-style-type: none"> <li>• SDK Demo Package: <b><i>A2019.09-packageSDK-1.0.0.zip</i></b></li> <li>• Documentation: <b><i>A2019.09-package-annotations-javadoc.zip</i></b></li> </ul>
<i>November 2019 Release (A2019.08)</i>	<ul style="list-style-type: none"> <li>• SDK Demo Package: <i>A2019.08-packageSDK-1.0.0.zip</i></li> <li>• Documentation: <i>A2019.08-package-annotqtions-javadoc.zip</i></li> </ul>
<b><i>October 2019 Release (A2019.07)</i></b>	<ul style="list-style-type: none"> <li>• SDK Demo Package: <i>A2019.07-Package-Sdk-1.0.0.zip</i></li> <li>• Documentation: <i>A2019.07-package-annotations-javadoc.zip</i></li> </ul>

Configure the build files, compile the JAR file, add the package to your Control Room, and then build a bot to test your package. *Build and test a demo package and bot.*

### **Related concepts**

[Standard coding practices and guidelines for developing packages](#)

This topic covers standard coding practices and guidelines that help to ensure the development of high quality packages.

[How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

[Annotations](#)

This section provides reference information about the annotations used to create Automation Anywhere packages.

### [Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

### Related tasks

#### [Develop a sample package](#)

Develop your own package and upload it to an Control Room to provide custom actions for bots.

## Standard coding practices and guidelines for developing packages

This topic covers standard coding practices and guidelines that help to ensure the development of high quality packages.

### Testing

Ensure high quality code. Write sufficient unit tests and integration tests for your package.

### Icons

Set proper icon for your package.

### Setting the version manually

The SDK package build version gets updated automatically every time a build happens. However, you can set it manually in the command project of a common **build.gradle** file.

- Update the **build.gradle** file before a build.
- Enter up to four digits numbers, separated by a period, as shown below:

```

. . .
ext {
    version '2.0.8'
}
dependencies {...}

```

### Dependencies

Embed all the dependencies in your package JAR. Load the dependencies at run time by extracting them to a temporary location. Be sure to clean the temporary location after the dependencies are loaded.

### Dependent JAR files

Add dependent JAR files under dependencies in the **build.gradle** file as implementation so that the dependant JAR files are packaged.

```

. . .
dependencies {
    compileOnly name: 'command-
annotations'
    compileOnly name: 'bot-runtime'
    compileOnly name: 'bot-api'
    implementation name: 'il8n-api'
        implementation name:
'mydependentjavafile.jar'
    apt name: 'command-processor'
    compileOnly group:
'org.apache.logging.log4j',

```

```

name: 'log4j-core', version:
"$loggerVersion"
testImplementation
"org.testng:testng:$testNgVersion"
testImplementation name: 'bot-
runtime'
testImplementation name: 'bot-api'
}
. . .

```

### Add new actions to the exiting package

When adding new actions to an existing package, make sure to do clean before packaging. It is always a good practice to do clean build - gradlew.bat clean build shadowJar.

### Error messages

Provide meaningful error messages.

- **Do** throw meaningful error messages. For example, in local language using i18n APIs with `BotCommandException`, throw a new exception

```
BotCommandException(MESSAGES.getString("Run.E
```
- **Do not** throw generic error messages, such as `ex.message`.

### Basic validation

Use the validation annotation rules, such as `@NotEmpty` included with this development kit. Do not add basic validations for your code. See [Validation annotations](#).

### Loops

Avoid long running loops in your code. Long running loops can cause high CPU usage, leading to errors such as, "Bot is unresponsive."

### Add logging

Use the default **log4J** logger provided in the bot run time framework. Do not add your own logger. See the sample code for details.

### Logging levels

- **ERROR/FATAL**: Severe error event that the user is affected and there is no workaround.
- **WARN** : Unexpected error occurred but the system has recovered from it.
- **INFO**: Informational messages about state change, for example, an accepted request.
- **DEBUG**: Detailed diagnostic information that will be required to debug when something goes wrong.
- **TRACE**: All information is captured about an application behavior.

If you are not sure of the log level, set it to **TRACE**.



**Related concepts**[Standard coding practices and guidelines for developing packages](#)

This topic covers standard coding practices and guidelines that help to ensure the development of high quality packages.

[How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

[Annotations](#)

This section provides reference information about the annotations used to create Automation Anywhere packages.

**Related tasks**[Set up the Java project](#)

Set up an integrated development environment (IDE) for Java, including Automation Anywhere custom annotations to develop an action package that you can upload to your Control Room.

## Using the package SDK

These example topics provide a basic understanding of how to use the Package SDK with Automation 360. Each SDK package includes a collection of configurable files that you can use to build a custom package, and then use the package to create TaskBots.

Use the following steps to create, configure, and build an IntelliJ project to compile a new package, and then create a bot to test the package you created.

1. Download, extract, and review the Package SDK files:
  - Download the latest Automation Anywhere A2019 Package SDK.
    - [Enterprise A2019 Package Development Kit Release Notes](#)
  - Go to your `Downloads` folder, right-click your downloaded Package SDK, and select **Extract All**.
  - Review all the files included in the package. You can drop any java file in your IntelliJ project to view or edit the content.
2. Install the latest Automation 360 version:
  - a) After the installation, log in to the Control Room with an admin privilege and create a new user with permissions to upload a package and create bots.
    - [Create a user](#)
  - b) Connect your local device to the Control Room. If required, download and install the latest Bot agent.
    - [Install Bot agent and register device](#)
3. Install Java SE Development Kit 11 or IntelliJ IDE Community Edition and Gradle plug-in.
  - Java SE Development Kit 11
    - [Java SE Development Kit 11 Downloads](#)
  - Java IDE
    - [Community edition of IntelliJ](#)
4. Configure the sample build files in the IntelliJ project.
  - [Configure build files using IntelliJ](#)
5. Create a new directory, package, and class.
  - [Create new java class and directory, and update files using IntelliJ](#)
6. Use the compiled JAR file as a package and upload it to your Control Room in Automation 360.
  - [Upload custom package to your Control Room](#)

## 7. Create a TaskBot to test the new package.

*Create a bot to test the new package*

## 8. Optional: Verify the results, and if required, add additional actions to your bot flow, and configure parameters and values.

## 9. View additional resources.

To learn more, search for the *Package SDK: How to examples*.

*Configure build files using IntelliJ*

## Configure build files using IntelliJ

Use IntelliJ to configure and compile a JAR file, and then upload it as a package to your Control Room in Automation 360.

A basic understanding of JDK and Java IntelliJ is required in order to build an action package. Ensure you have the following software and files:

- [Java SE Development Kit 11 Downloads](#)
- Java IDE [Community edition of IntelliJ](#)
- Automation Anywhere A2019 SDK. Download and extract the zip file for the release you require: [Enterprise A2019 Package Development Kit Release Notes](#)

1. Unzip the contents of the SDK package to your `IdeaProjects` directory and rename the folder from `<latest package sdk zip file>` to `A2019FileDetails`.
2. In IntelliJ IDEA, go to **File > Open** and open the project located at `C:\Users\<User>\IdeaProjects\A2019FileDetails`.
3. Open the `settings.gradle` file in the project root, and set the `rootProject.name = 'A2019FileDetails'`
4. Update the `package.template` file located at **src > main > resources > package.template**.
5. Change the package name from `A2019DemoPackage` to `A2019FileDetails`.
6. Update the package name in **locales json**: go to **src > main > resources > locales > en\_US.json**.
  - a) Open the `en_US.json` file and update the **required** `label` field. Update the optional `description`.
  - b) Delete all other remaining lines in the `en_US.json` file.
7. Open the `build.gradle` in the project root. After the dependencies section, remove other dependencies, if they are not required.
8. Save all files.

*Create new java class and directory, and update files using IntelliJ*

## Create new java class and directory, and update files using IntelliJ

Use IntelliJ to create a new java class and a new directory, and configure other build files.

Complete the steps in the following task: [Configure build files using IntelliJ](#).

1. Create a new **Java Class**, right-click the `com.automationanywhere.botcommand` package, and select **New > Java Class**. Enter the name for the new class `GetFileDetails`.
  - a) Copy `@BotCommand` from the `Concatenate.java` and paste it into the new `GetFileDetails.java` file.

```
import static com.automationanywhere.commandsdk.model.DataType.STRING;
//BotCommand makes a class eligible for being considered as an action.
```

```

@BotCommand
//CommandPkgs adds required information to be dispalable on GUI.
@CommandPkg(
    //Unique name inside a package and label to display.
    name = "concatenate", label = "[[Concatenate.label]]",
    node_label = "[[Concatenate.node_label]]", description =
    "[[Concatenate.description]]", icon = "pkg.svg",

    //Return type information. return_type ensures only the right kind
    of variable is provided on the UI.
    return_label = "[[Concatenate.return_label]]", return_type = STRING,
    return_required = true)
public class Concatenate {

    //Messages read from full qualified property file name and provide
    i18n capability.
    private static final Messages MESSAGES = MessagesFactory
        .getMessages("com.automationanywhere.botcommand.samples.messages");

    //Identify the entry point for the action. Returns a Value<String>
    because the return type is String.
    @Execute
    public Value<String> action(
        //Idx 1 would be displayed first, with a text box for entering the
        value.
        @Idx(index = "1", type = TEXT)
        //UI labels.
        @Pkg(label = "[[Concatenate.firstString.label]]")
        //Ensure that a validation error is thrown when the value is null.
        @NotEmpty
        String firstString,

        @Idx(index = "2", type = TEXT)
        @Pkg(label = "[[Concatenate.secondString.label]]")
        @NotEmpty
        String secondString) {

        //Internal validation, to disallow empty strings. No null check
        needed as we have NotEmpty on firstString.
        if ("".equals(firstString.trim()))
            throw new
            BotCommandException(MESSAGES.getString("emptyInputString",
            "firstString"));

        if ("".equals(secondString.trim()))
            throw new
            BotCommandException(MESSAGES.getString("emptyInputString",
            "secondString"));

        //Business logic
        String result = firstString + secondString;

        //Return StringValue.

```

```
return new StringValue(result);
```

- b) Update the `@CommandPkg` parameters such as: `name`, `label`, `node_label`, `description`, and `icon`.
  - c) Update the `return_label` and the `return_type`.
  - d) Add the `NumberValue` action, internal validation, business logic, and the return value.
  - e) Delete the `Concatenated.java` file and `samples.commands.basic` directory, and the `sample.commands` directory.
2. Configure the `en_US.json` file: go to `src > main > resources > locales > en_US.json` and add the following fields after the label and description values, and delete other parameters from the file.

```
{
  "label": "File Details",
  "description": "Returns basic file details",
  "GetFileDetails.label": "File Size",
  "GetFileDetails.description": "Return the size of the selected file in bytes",
  "GetFileDetails.node_label": "File Size in Bytes",
  "GetFileDetails.return_label": "File Size",
  "GetFileDetails.return_label_description": "Return in bytes",
  "GetFileDetails.filePath.label": "Select a File for analysis"
}
```

3. Delete packages: go to `src > main > java > com.automationanywhere.botcommand`, and delete the `samples.commands` and delete the `samples` packages.
4. Import new icons from Github and update the `CommandPkg` annotation.
  - a) Download any icons you want to use in your bot flow and save them as `.svg` files.
  - b) Copy your image files into the `src > main > resources > icons` folder.
5. Create a new directory: go to `src`, right-click, and select **New > Directory**.
  - a) In the **Name** field, enter `test\java`. Alternatively, select the `test\java`, and enter the name `TestFileSize`.
  - b) Configure test annotations in the `TestFileSize` java class.
  - c) Create a `@test` public class, create a `GetFileDetails` object, and invoke the action.
  - d) Optional: Run the `TestGetFileDetails` in IntelliJ to test it.
6. Configure the `TestFileSize` file, and open `TestFileSize` and copy and paste the following code:

```
{
  @Test
  public void TestGetFileDetails() {
    String filePath = "src\\main\\resources\\icons\\sample.svg";
    //Create GetFileDetails Object
    GetFileDetails getFileDetails = new GetFileDetails();
    //invoke action
    NumberValue output = getFileDetails.action(filePath);
    Assert.assertEquals(output.getAsDouble(), 5027.0);
  }
}
```

7. Save the project: **File > Save All**.
8. Click **Reload All Gradle Projects**, and then click **Execute Gradle Task**, and verify that the **A2019FileDetails** project is selected.

- In the **Run Anything** window, enter `gradle clean build shadowJar`.  
After it runs, the following message is displayed: `BUILD SUCCESSFUL in 8s <number of seconds>`

### *Upload custom package to your Control Room*

## Upload custom package to your Control Room

Use the compiled JAR file and upload it as a package to your Control Room in Automation 360.

- Complete the steps in the following task: *Create new java class and directory, and update files using IntelliJ*.
  - Ensure you have the following:
    - Access to the Control Room.
    - Credentials with **AAE\_Basic** permission or a custom role with the capability to upload packages to the Control Room.
- From Windows Explorer, go to `C:\Users\\IdeaProjects\A2019-FileDetails\build\libs` and locate `A2019FileDetails-2.0.9.jar`.
  - Log in to your Control Room as a user with permissions to add a new package.
  - Click **BOTS > Packages**.
  - In the **All packages** page, move your mouse over the plus sign and click **Add package**.
  - In the **Add package** page, click **Browse** and locate the `A2019FileDetails-2.0.9.jar` file.  
By default, the file is located at: `C:\Users\\IdeaProjects\A2019-FileDetails\build\libs`.
  - Select the `A2019FileDetails-2.0.9.jar` file and click **Open**.
  - Click **Upload Package**.

### *Create a bot to test the new package*

## Create a bot to test the new package

Use the actions in Automation 360 to create a bot and test the new package you have added to your Control Room.

Ensure you have the following to build the bot:

- Access to the Control Room.
  - Credentials with **AAE\_Basic** permission or a custom role to create bots.
  - Your workstation is a registered device in the Control Room.
  - Your package `A2019FileDetails-2.0.9.jar` is available in the Control Room.
- Log in to the Control Room.
  - Go to **Bots > My bots**, and click the **Create a bot** icon.
  - In the **Name** field, enter `TestingFileSize` or any other name you want.
  - Click **Create & Edit**.
  - In the Actions pane, find **File Details** and drag **File Size** into the bot flow.
    - In the **Select a File for analysis** field, select **Desktop file**, click **Browse**, and select any file from your desktop.
    - Click **Create variable** to create a new number variable.
    - In **Create Variable**, enter `nFileSize` and click **Create & Select**.
    - Click **Apply**.

6. In the Actions pane, find the **Number** package and drag the **To String** command.
  - a) In the **Enter a number** field, enter **F2**, and select **nFileSize**.
  - b) In the **Assign the output to variable** field, select **prompt-assignment - String** from the drop-down list.
  - c) Click **Apply**.
7. From the Actions pane, drag **Message box**.
8. In the **Enter the message to display** field, click **F2** and select the **prompt-assignment variable**.
9. Click **Apply** and **Save**.
10. Click **Run**.  
The bot displays the `<The value of the file size>`, which is a successful build.

If you were not able to run bot your bot, go back and modify your configuration steps in your Control Room.

## How to examples

This section contains code examples and explanations about how to code some basic bot capabilities.

### *Return a value from an action*

Set the following properties on `CommandPkg` to store the action output in a variable.

### *Expose an action as a property*

An action can be exposed as property if it does not accept any parameter. This can be done by setting the following properties on `CommandPkg`.

### *Organize and group actions when developing packages*

Review the provided examples on how to add and group actions during the package SDK development process.

### *Create custom variables using Package SDK*

When using Automation 360, you can create custom variables using the SDK package.

### *Create a condition using Package SDK*

When using Automation 360, you can create a condition with the SDK package.

### *Add a condition in a custom package for If condition*

Add conditions in a custom package.

### *Create an iterator using Package SDK*

In Automation 360, you can create an iterator with the SDK package. An iterator is used to loop through multiple objects of similar type and is used with the `Loop` package. It consists of two methods, `next` and `hasNext`, which return the actual object and a boolean value.

### *Create a trigger using Package SDK*

When using Automation 360, you can create a trigger using the SDK package.

### *Custom triggers - pull and push mechanism*

The examples provided in this topic demonstrate how to create time-based and event-based triggers, pull ([link TriggerDemo](#)) and push (`SimpleMessageListenerContainer`) mechanisms using the SDK package.

### *Add an iterator in a custom package for Loop action*

Add an iterator in your package for `Loop` action.

*Add debug logs of custom packages to bot\_launcher.log file*

You can add logs using `log4j`. The dependency is already added in the package SDK sample `build.gradle` file.

*Handle sessions in a custom package*

You can extract a session using a session name from the `SessionsMap`. In the same package, you can use sessions to pass information between actions, but not to other packages.

*Configure shared session attributes using Package SDK*

Create new Package SDK files and modify existing files to configure a variable, command, and the attribute type to share details between TaskBots.

*Create a bot to test the custom package*

A shared session enables you to reuse actions between TaskBots that run concurrently, for example, using the same Excel file to pass values.

## Actions

Any action class supports only one method as an entry point. Annotate all parameters of the entry point method with `Idx`. There are three types of actions:

- Command\Action (default choice)
- Iterator
- Condition



**CAUTION:** If you do not provide a public setter to member variables with `Inject`, compilation errors occur.

## Related concepts

[Standard coding practices and guidelines for developing packages](#)

This topic covers standard coding practices and guidelines that help to ensure the development of high quality packages.

[Annotations](#)

This section provides reference information about the annotations used to create Automation Anywhere packages.

## Related tasks

[Set up the Java project](#)

Set up an integrated development environment (IDE) for Java, including Automation Anywhere custom annotations to develop an action package that you can upload to your Control Room.

[Develop a sample package](#)

Develop your own package and upload it to an Control Room to provide custom actions for bots.

## Return a value from an action

Set the following properties on `CommandPkg` to store the action output in a variable.

### Action return values

- **return\_type**  
Defines the return type of the action. It usually matches the entry method return type.
- **return\_required**  
When the value is set to `true` the return value is required.
- **return\_label**

A description of the UI label for the variable value.

### Example: Converts a sourceString to upper case and assigns the result to returnTo

```
//BotCommand makes a class eligible for being considered as an action.
@BotCommand

//CommandPks adds required information to be displayable on the UI.
@CommandPkg(
    //Unique name inside a package and label to display.
    name = "uppercase", label = "[[Uppercase.label]]",
    node_label = "[[Uppercase.node_label]]", description =
    "[[Uppercase.description]]", icon = "pkg.svg",

    //Return type information. return_type ensures only the right kind of
    variable is provided on the UI.
    return_label = "[[Uppercase.return_label]]", return_type =
    STRING, return_required = true)
public class Uppercase {

    //Messages read from a fully qualified property file name and provides i18n
    capability.
    private static final Messages MESSAGES = MessagesFactory
        .getMessages("com.automationanywhere.botcommand.samples.messages");

    //Identify the entry point for the action. Returns a Value <String> because
    the return type is String.
    @Execute
    public Value<String> action(
        //Idx 1 would be displayed first, with a text box for entering the value.
        @Idx(index = "1", type = TEXT)
        //UI labels.
        @Pkg(label = "[[Uppercase.sourceString.label]]")
        //Ensure that a validation error is thrown when the value is null.
        @NotEmpty
        String sourceString,
```

### Related concepts

#### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

### Expose an action as a property

An action can be exposed as property if it does not accept any parameter. This can be done by setting the following properties on `CommandPkg`.

#### Action property values

**property\_name**

The name of the property, unique at action level, in auto-complete box this name would appear.

**property\_description**

A description of the property.

**property\_type**

The data type on which property operates, only if the type matches, the property will be appear in the auto-complete box.

**property\_return\_type**

The data type for what property returns. If this type does not match with the field type where it is used, there will be validation error.

```
@BotCommand
@CommandPkg(label = "Uppercase", name = "uppercase", description="Converts
the source string to upper case.",
icon = "uppercase.svg", node_label="Convert {{sourceString}} to upper case|
and assign the result to {{returnTo}}|",
return_type=DataType.STRING, return_required = true, return_label="Assign
the output to variable",
property_name="uppercase", property_description="Converts the string to
upper case", property_type=DataType.STRING,
property_return_type=DataType.STRING) public class UpperCase {

    @Execute
    public Value<String> convert(
        @Idx(index = "1", type=TEXT)
        @Pkg(label="Source string")
        @NotEmpty
        String sourceString){
        return new StringValue(sourceString.toUpperCase());
    }
}
```

**Related concepts**[How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

**Organize and group actions when developing packages**

Review the provided examples on how to add and group actions during the package SDK development process.

**Example: Add actions**

```
@BotCommand

//CommandPk adds required information to be dispalable on the UI.
@CommandPkg(
    //Unique name inside a package and a label to display.
    name = "concatenate", label = "[[Concatenate.label]]",
    node_label = "[[Concatenate.node_label]]", description =
    "[[Concatenate.description]]", icon = "pkg.svg",

    //Return type information. return_type ensures only the right kind of
    variable is provided on the UI.
    return_label = "[[Concatenate.return_label]]", return_type = STRING,
    return_required = true)
```

**Example: Group actions**

Use the `group_label` to `ConcatenateGroup` which it is displayed in the UI also as **ConcatenateGroup**. When the `group_label` is not used, you will get all the actions in the respective package.

```
@BotCommand

//CommandPk adds required information to be dispalable on the UI.
@CommandPkg(
    //Provide a unique name inside a package and a label to display.
```

```

group_label = "ConcatenateGroup", name = "concatenateWithGroup", label =
"concatenateWithGroup",
node_label = "[[Concatenate.node_label]]", description =
"[[Concatenate.description]]", icon = "pkg.svg",

//Return type information. return_type ensures only the right kind of
variable is provided on the UI.
return_label = "[[Concatenate.return_label]]", return_type = STRING,
return_required = true)
public class ConcatenateWithGroup {

```

## Create custom variables using Package SDK

When using Automation 360, you can create custom variables using the SDK package.

### Using custom variables

Use Automation 360 to create a custom variable. This is a system variable and is used as other bot variables, except it is read-only and the value is calculated instead of being assigned.

### Required annotations

For creating a variable, the following annotations are required:

Annotation	Usage
BotCommand	Use the BotCommand annotation with the variable as commandType. This ensures that the plain old Java object (POJO) is suitable for creating an Automation 360 variable.
CommandPkg	These values are used when creating a package. Provide a name, label, and description to the annotation.
Idx	Annotate all the parameters and member variables that are required and help with the validation check. Alternatively they might be displayed in the interface for the input. Provide the index (Idx) and the type.
Pkg	Annotate all the parameters and member variables that will be shown in the interface. This annotation will be ignored if it is not accompanied by the Idx.
VariableExecute	The method that has to be called for returning the variable value. This method does not accept any input parameters. Sessions and GlobalSessionContext are available through setter injection.

## Use case example

The following use case shows how to return the current time for the system default zone.

1. Create the POJO class with the business logic:

```
public class Now {

    public DateTimeValue now() {
        Instant instant = Instant.now();
        ZonedDateTime now = instant.atZone(ZoneId.systemDefault());
        return new DateTimeValue(now);
    }

}
```

2. Annotate the POJO class to enable it for the Automation 360 variable and to create the package:

```
@BotCommand(commandType = BotCommand.CommandType.Variable)
@CommandPkg(description = "The current datetime at system default zone.",
    name = "Now", label = "", variable_return_type = DataType.DATETIME)
public class Now {

    public DateTimeValue now() {
        Instant instant = Instant.now();
        ZonedDateTime now = instant.atZone(ZoneId.systemDefault());
        return new DateTimeValue(now);
    }

}
```

3. Annotate the `now` method to denote it to be the execute method.

```
@VariableExecute
public DateTimeValue now() {
    Instant instant = Instant.now();
    ZonedDateTime now = instant.atZone(ZoneId.systemDefault());
    return new DateTimeValue(now);
}
```

Every variable must have one test `VariableExecute` method.

### Related concepts

#### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Create dictionary type variables

Use Automation 360 to create dictionary type variables using different dictionary subtypes and key value type parameters.

- Ensure you have access to the Control Room.
- You must have credentials with **AAE\_Basic** permissions.
- Your workstation must be a registered device in the Control Room.

1. Log in to the Control Room.
2. Go to **Bots > My bots**, and click the **Create a bot** icon.
3. In the **Name** field, enter `DictionaryMapping`, and click **Create & Edit**.

4. Create four new custom variables:
  - a) Create a new *Dictionary1* variable of **Type** > **Dictionary** and **Subtype** > **String**, and then click **Apply**.
  - b) Create a new *Dictionary2* variable of **Type** > **Dictionary** and **Subtype** > **String**, select **Use as output**, click **Add (+)** sign, and enter **Key** and **Value** as strings, and then click **Apply**.
  - c) Create a new *Dictionary3* variable of **Type** > **Dictionary** and **Subtype** > **Number**, click **Add** sign, and enter **Key** as a string and **Value** as a number, and then click **Apply**.
  - d) Create a new *Dictionary4* variable of **Type** > **Dictionary** and **Subtype** > **Any**, click **Add** sign, and enter **Type** > **String** > **Key** > **Name** > **Value** as a number **Type** > **Datetime** > **Key** > **Date**, enter **Value** for **Datetime** location, enter **Type** > **Boolean** > **Key** > **Result** > **Value** > **True**, and then click **Apply**.
5. In the Actions pane, find **Message box**. In **Enter the message to display**, enter **F2**, and select the variable **Dictionary1** > **Dictionary key** > **Name**.
6. Save the bot and run the **DictionaryMapping** TaskBot.

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Using EntryList

EntryList enables you to accept any number of parameters through the bot designer. The parameter structure is defined in the Automation 360 actions.

## Example: EntryList

The following example shows how to create a parameter with the name of `village` pair.

```
@BotCommand
@CommandPkg(label = "EntryList example", description = "EntryList example",
  icon = "sample.svg", name = "entryListExample")
public class EntryListExample {
  // UI display for ENTRYLIST 1.1, the linking is done based on the ENTRYLIST
  title.
  // This should be added as a child of the ENTRYLIST, however it should not
  be part of options.
  // The EntryList does not need a setter or Inject as the value is provided
  inside the ENTRYLIST.
  @Idx(index = "1.3", type = TEXT, name = "NAME")
  @Pkg(label = "Name", default_value_type = DataType.STRING)
  @NotEmpty
  private String name;
  //Linked to 1.2 through title.
  @Idx(index = "1.4", type = TEXT, name = "VILLAGE")
  @Pkg(label = "village", default_value_type = STRING)
  private String city;
  @Execute
  public void setParameter(
    // Add the entryList, the values are accepted as a list of values.
    // Provide the column header for the tabular display of accepted entries.
    // In Pkg, provide a unique title.
    // Provide Idx for each option separately, this is needed to
    // have the correct UI type when the entry form is presented.
    // Add only columns to options, you cannot add their definitions.
    @Idx(index = "1", type = ENTRYLIST, options = {
```

```

        @Idx.Option(index = "1.1", pkg = @Pkg(title = "NAME", label = "Name")),
        @Idx.Option(index = "1.2", pkg = @Pkg(title = "VILLAGE", label =
"village")),
    })
    //Label that is displayed in the UI
    @Pkg(label = "Provide name value entries")
    //Header of the entry form
    @EntryListLabel(value = "Provide entry")
    //Button label which displays the entry form
    @EntryListAddButtonLabel(value = "Add entry")
    //Unique rule for the column, this value is the column TITLE.
    @EntryListEntryUnique(value = "NAME")
    //Message to display in the table when no entries are present.
    @EntryListEmptyLabel(value = "No parameters added")
    List<Value> entryList) {
}

```

Here is another example of the EntryList, define the values of the EntryList usage.

```

//Entry list//
@Idx(index = "1", type = ENTRYLIST, options = {
    @Idx.Option(index = "1.1", pkg = @Pkg(title = HEADER_ENABLED, label =
"[[HEADER1]]")),
    @Idx.Option(index = "1.2", pkg = @Pkg(title = HEADER_NAME, label =
"[[HEADER1]]")),
    @Idx.Option(index = "1.3", pkg = @Pkg(title = HEADER_VALUE, label =
"[[HEARER3]]"))
})
@Pkg(label = "customHeaderslabel")
@EntryListLabel(value = "customHeaderlabel")
@EntryListAddButtonLabel(value = "add.header")
@EntryListEmptyLabel(value = "no.header")
@Inject
List<Value> customHeaders;

```

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Using regular expression

Use regular expressions (regex) to create string patterns that help match, locate, or manage text in Java. Together, the literals and special characters define a logical pattern. Use the pattern to compare strings of text to check if the strings match the defined pattern.

### Example: MatchesRegex

Use `MatchesRegex` to test the string pattern.

In the following example, the input pattern starts from the English alphabet, uppercase and lowercase, (A-Z/a-z) and ends with a numeric value.

```

@Idx(index = "1", type = TEXT)
@Pkg(label = "Field label", description = "Field description"])
@MatchesRegex("[A-Za-z]\w*")
@NotEmpty
String cell

```

If the pattern does not match, the following message is displayed: `Must match pattern.`

### Related concepts

#### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Create a condition using Package SDK

When using Automation 360, you can create a condition with the SDK package.

### Using a condition

If and Loop are branching constructs in Automation 360. They are used to run a sequence of actions when a condition is set to `true`. A condition is used along with the If and Loop packages. A condition takes a set of inputs and returns a Boolean value.

### Required annotations

For creating a condition, the following annotations are required:

Annotation	Usage
<code>BotCommand</code>	Use the <code>BotCommand</code> annotation with the <code>condition as commandType</code> . This ensures that the plain old Java object (POJO) is suitable for the creation of an Automation 360 condition.
<code>CommandPkg</code>	These values are used when creating a package. Provide a name, label, and description to the annotation.
<code>Idx</code>	Annotate all the parameters and member variables that are required and help with the validation check, or they might be displayed in the interface for the input. Provide the index ( <code>Idx</code> ) and the type.
<code>Pkg</code>	Annotate all the parameters and member variables that will be shown in the interface. This annotation will be ignored if it is not accompanied by the <code>Idx</code> .
<code>ConditionTest</code>	The method that has to be called for testing the condition. It must return a Boolean value. If the method accepts parameters, then annotate them with <code>Idx</code> .

### Use case example

The following use case verifies whether the given number is greater than the other number.

1. Create the POJO class with the business logic:

```
public class IsGreater {
    public Boolean checkGreater(Double first, Double checkAgainst) {
        return first > checkAgainst;
    }
}
```

```
}

```

2. Annotate the POJO class to enable it for the Automation 360 condition and to create the package:

```
@BotCommand(commandType = Condition)
@CommandPkg(label = "Is greater condition", name = "IsGreater",
  description = "Checks if the given number is greater than the other.",
  node_label = "{{first}} > {{checkAgainst}} ")
public class IsGreater {
  public Boolean checkGreater(Double first, Double checkAgainst) {
    return first > checkAgainst;
  }
}
```

3. Annotate the `checkGreater` method to indicate that this method should be used as a comparison method.

```
@ConditionTest
public Boolean checkGreater(Double first, Double checkAgainst) {
  return first > checkAgainst;
}
```

Every condition must have exactly one test condition method.

4. Annotate the parameters of the `checkGreater` method with `Idx` and `Pkg`.

Add `@NotEmpty` to ensure the value is not null.

```
@ConditionTest
public Boolean checkGreater(
  @Idx(index = "1", type = AttributeType.NUMBER) @Pkg(label = "Number to
  check") @NotEmpty Double first,

  @Idx(index = "2", type = AttributeType.NUMBER) @Pkg(label = "Number to
  compare against") @NotEmpty Double checkAgainst) {

  return first > checkAgainst;
}
```

The attribute type number returns a `Double`.

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Add a condition in a custom package for `If` condition

Add conditions in a custom package.

## Create condition values in an Action

- To create a condition, set `commandType` property of `BotCommand` annotation with value as `Condition`.
- To define the entry method of the condition, use the annotation `ConditionTest`.

```
@BotCommand(commandType = Condition)
@CommandPkg(label = "File exists", name = "fileExists",
```

```

        description = "Checks if the file exists.",
        node_label = "file exists at {{sourceFilePath}}", icon = "")
public class Exist extends AbstractCondition {
    @ConditionTest
    public boolean test(@Idx(index = "1", type = FILE) @LocalFile @Pkg(label =
= "File path") @NotEmpty String sourceFilePath,
        @Idx(index = "2", type = NUMBER) @Pkg(label = "How
long you would like to wait for this condition
to be true?(Seconds)",
        default_value = "0", default_value_type =
DataType.NUMBER)
        @GreaterThanEqualTo("0") @LessThanEqualTo("99999")
        @NotEmpty @NumberInteger Double waitTimeout) {

        // Add the logic to check for the condition
    }
}

```

The following example verifies if the provided boolean value is false.

Set `commandType` to `Condition`.

```

@BotCommand(commandType = Condition)
@CommandPkg(label = "False condition example", name =
"conditionalTypeExample",
    description = "Checks if the boolean value is false.")
public class ConditionalTypeExample {

    @ConditionTest
    public Boolean validate(
        @Idx(index = "1", type = AttributeType.BOOLEAN)
        @VariableType(BOOLEAN)
        @Pkg(label = "Boolean variable", default_value_type = BOOLEAN)
        @NotEmpty Boolean variable
    ) {
        return variable == null ? false : !variable ;
    }
}

```

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Create an iterator using Package SDK

In Automation 360, you can create an iterator with the SDK package. An iterator is used to loop through multiple objects of similar type and is used with the Loop package. It consists of two methods, `next` and `hasNext`, which return the actual object and a boolean value.

## Required annotations

When iterator is used, the `next` method returns the next available value. If no more values are available, an exception is shown. The `hasNext` method checks for other values and returns `false` if no more values are available. In Automation 360, when the loop is executed, `hasNext()` is called first, and `next()` is called only if `hasNext()` returned a `true` value.

For creating an iterator, the following annotations are required.

Annotation	Usage
BotCommand	Use the BotCommand annotation with an iterator as the commandType. This ensures that the plain old Java object (POJO) is eligible for creating an Automation 360 iterator.
CommandPkg	When creating a package, provide a name, label, and description to the annotation.
Idx	Annotate all parameters and member variables that are required and help with the validation check, or they can be displayed in the interface for the input. Provide the Idx and the type.
Pkg	Annotate all parameters and member variables that will be displayed in the interface. This annotation will be ignored if it is not accompanied by the Idx.
HasNext	The method that has to be called for testing if the iteration has more elements (returns true if next() returns an element rather than throwing an exception). It must return a Boolean value.  If the method accepts parameters, then they must be annotated with the Idx. The hasNext method verifies it and returns false if no more values are available. InAutomation 360, when Loop is executed, hasNext() is called first. next() is called only if hasNext() returns a true value.
Next	The method returns the next available value in the iteration. The return type is a value. If no more value is available, an exception is shown.

### Use case example

The example use case loops through number of times, for example, for (int i=0; I<n; i++) Java construct. It accepts the value of n from the Bot Creator when the bot is created.

#### 1. Create the POJO class with the business logic.

Ensure that the POJO has a method and returns a boolean value. This will act as the comparison method.

```
@BotCommand(commandType=CommandType.Iterator)
@CommandPkg(return_label = "Return the value in variable", node_label =
": {{times}} times",
label = "Iterator demo", description = "Iterate number of times", name =
"iteratorTypeDemo", return_type = DataType.NUMBER)
public class IteratorTypeDemo {
    @Idx(index = "1", type = AttributeType.NUMBER)
    @Pkg(label = "times", default_value = "10", default_value_type =
DataType.NUMBER)
    @GreaterThanEqualTo("0")
    @NumberInteger
    @NotEmpty
    @Inject
    private Double times = 10d;

    private Double counter = 0d;
```

```

    @HasNext
    public boolean hasNext() {
        return counter < times;
    }

    @Next
    public Value<Double> next() throws Exception{
        if (counter >= times)
            throw new Exception("Counter '"+ counter +"' is exceed the times limit
            '"+times+"'");

        counter++;
        NumberValue result = new NumberValue();
        result.set(counter);
        return result;
    }

    public void setTimes(Double times) {
        this.times = times;
    }
}

```

2. Annotate the POJO class to enable it for the Automation 360 iterator and to create a package.

```

@BotCommand(commandType = CommandType.Iterator)
@CommandPkg(return_label = "Return the value in variable", node_label =
    ": {{times}} times",
    label = "Iterator demo", description = "Iterate number of times", name =
    "iteratorTypeDemo", return_type = DataType.NUMBER)
public class IteratorTypeDemo {

    private Double times = 10 d;
    private Double counter = 0 d;

    public boolean hasNext() {
        return counter < times;
    }
}

```

3. Annotate the `hasNext()` and `next()` method appropriately.

```

@HasNext
public boolean hasNext() {
    return counter < times;
}

@Next
public Value < Double > next() throws Exception {
    if (counter >= times)
        throw new Exception("Counter '" + counter + "' is exceed the times
        limit '" + times + "'");

    counter++;
    NumberValue result = new NumberValue();
    result.set(counter);
    return result;
}

```

The methods are named in easy-to-use way and are in parallel with the Java iterator interface. There is no restriction from the SDK side when naming methods.

In an iterator, do not use parameter methods, but use `setter injection`.

#### 4. Annotate the variables with `Idx` and `Pkg`.

Add `@NotEmpty` to ensure the value is not null, and add `@GreaterThanEqualTo` to ensure the value is always greater than 0.

```
@Idx(index = "1", type = AttributeType.NUMBER)
@Pkg(label = "times", default_value = "10", default_value_type =
    DataType.NUMBER)
@GreaterThanEqualTo("0")
@NotEmpty
@Inject
private Double times = 10 d;
```

The attribute type number returns a `Double`.

#### Related concepts

##### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Create a trigger using Package SDK

When using Automation 360, you can create a trigger using the SDK package.

### Using a trigger

Use Automation 360 to create a trigger. A trigger launches a bot when certain conditions are met and waits until conditions have changed or stopped. When the conditions of the trigger are matched, the run method is called to signal the trigger.

### Required annotations

For creating a trigger, the following annotations are required:

Annotation	Usage
<code>BotCommand</code>	Use the <code>BotCommand</code> annotation with the trigger as <code>commandType</code> . This ensures that the plain old Java object (POJO) is suitable for creating the trigger with Automation 360.
<code>CommandPkg</code>	These values are used when creating a package. Provide a name, label, and description to the annotation.
<code>Idx</code>	Annotate all the parameters and member variables that are required and help with the validation check. Alternatively, they might be displayed in the interface for the input. Provide the index ( <code>Idx</code> ) and the type.
<code>Pkg</code>	Annotate all the parameters and member variables that will be shown in the interface. This annotation will be ignored if it is not accompanied by the <code>Idx</code> .
<code>StartListen</code>	Starts the trigger listener.

Annotation	Usage
TriggerId	A trigger ID, which is required for stopping the trigger.
TriggerRunnable	Provides the runnable. Calling the runnable sends a signal that launches a bot associated with a trigger.

## Use case example

The following use case shows how to create a timer trigger that triggers a bot at a regular interval.

### 1. Create the POJO class with the business logic:

```
public class TriggerDemo {

    private static final Timer TIMER = new Timer(true);

    public void startTrigger(Double interval) {
        TimerTask timerTask = new TimerTask() {

            @Override
            public void run() {
                // Do nothing
            }
        };

        TIMER.schedule(timerTask, interval.longValue());
    }
}
```

Multiple triggers of the same type can exist in a bot. All triggers are identified by a `triggerId`.

### 2. Add a `triggerId` to the class:

```
@TriggerId
private String triggerUid;

public String getTriggerUid() {
    return triggerUid;
}

public void setTriggerUid(String triggerUid) {
    this.triggerUid = triggerUid;
}
```

### 3. Store the `TimerTask` separately so that when you want to stop a specific trigger, use the `triggerId`.

```
private static final Map<String, TimerTask> taskMap = new
    ConcurrentHashMap<>();

public void startTrigger(Double interval) {
    TimerTask timerTask = new TimerTask() {

        @Override
        public void run() {
            // Do nothing
        }
    };

    taskMap.put(triggerId, timerTask);
    TIMER.schedule(timerTask, interval.longValue());
}
```

```

    }
    };
    taskMap.put(this.triggerUid, timerTask);
    TIMER.schedule(timerTask, interval.longValue());
}

```

**4. Start a trigger when conditions are met. Accept a runnable and call it appropriately.**

```

@TriggerRunnable
private Runnable runnable;

public Runnable getRunnable() {
    return runnable;
}

public void setRunnable(Runnable runnable) {
    this.runnable = runnable;
}

public void startTrigger(Double interval) {
    TimerTask timerTask = new TimerTask() {

        @Override
        public void run() {
            runnable.run();
        }
    };
    taskMap.put(this.triggerUid, timerTask);
    TIMER.schedule(timerTask, interval.longValue());
}

```

**5. Stop the trigger, either individually (use a triggerId), or stop all triggers at the same time (StopAllTriggers).**

```

/*
 * Cancel all the task and clear the map.
 */
@stopAllTriggers
public void stopAllTriggers() {
    taskMap.forEach((k, v) -> {
        if (v.cancel()) {
            taskMap.remove(k);
        }
    });
}

/*
 * Cancel the task and remove from map
 *
 * @param triggerUid
 */
@stopListen
public void stopListen(String triggerUid) {
    if (taskMap.get(triggerUid).cancel()) {
        taskMap.remove(triggerUid);
    }
}
}

```

**6. Add the remaining annotations.**

```

@BotCommand(commandType = BotCommand.CommandType.Trigger)

```

```

@CommandPkg(label = "Demo Trigger", description = "Demo Trigger", icon =
    "email.svg", name = "demoTrigger")
public class TriggerDemo {
    //Other code

    @StartListen
    public void startTrigger(@Idx(index = "1", type = AttributeType.NUMBER)
        @Pkg(label = "Please provide the interval to trigger in seconds",
            default_value = "120", default_value_type = DataType.NUMBER)
        @GreaterThan("0")
        @NumberInteger
        @NotEmpty
        Double interval) {
        //Other code
    }
}

```

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Custom triggers - pull and push mechanism

The examples provided in this topic demonstrate how to create time-based and event-based triggers, pull (link `TriggerDemo`) and push (`SimpleMessageListenerContainer`) mechanisms using the SDK package.

### Example: Time-based triggers - Pull mechanism

The required conditions of triggering are tested at the regular interval, in seconds.

- A trigger checks the database (DB) at regular intervals and if the SQL (DB) value that a user provides is more than 0, then the timer-based trigger is triggered.
- When the event occurs, it runs the `consumer.accept(<RecordValue Instance>)` method and triggers an associated bot.
- It verifies the conditions at each run.
- Add the valid DB driver in the **build.gradle** file to run this example.

This example is an extension of the timer-based trigger (`TriggerDemo`) and demonstrates the trigger pull mechanism.

---

**Note:** This is an illustrative example and do not use it in the production environment.

---

```

@BotCommand(commandType = BotCommand.CommandType.Trigger)
@CommandPkg(label = "JDBC Query Trigger", description = "JDBC Query
    Trigger", icon = "jdbc.svg", name = "jdbcQueryTrigger",
    return_type = RECORD, return_name = "TriggerData", return_description =
    "Available keys: triggerType")
public class DBStatus {

    private static Logger logger = LogManager.getLogger(DBStatus.class);

    // Map storing multiple tasks
    private static final Map<String, TimerTask> taskMap = new
    ConcurrentHashMap<>();

```

```

private static final Timer TIMER = new Timer(true);

@TriggerId
private String triggerUid;
@TriggerConsumer
private Consumer consumer;

/*
 * Starts the trigger.
 */
@StartListen
public void startTrigger(
    @Idx(index="1", type = AttributeType.TEXT)
    @Pkg(label = "Provide the database driver class")
    @NotEmpty
    String driverClassName,

    @Idx(index="2", type = AttributeType.TEXT)
    @Pkg(label = "Provide the Jdbc connection string")
    @NotEmpty
    String jdbcUrl,

    @Idx(index="3", type = AttributeType.TEXT)
    @Pkg(label = "Provide the user Name")
    @NotEmpty
    String userName,

    @Idx(index="4", type = AttributeType.CREDENTIAL)
    @Pkg(label = "Provide the password")
    @NotEmpty
    SecureString password,

    @Idx(index="5", type = AttributeType.TEXT)
    @Pkg(label = "Provide the SQL to check the records")
    @NotEmpty
    String sqlQuery,

    @Idx(index = "6", type = AttributeType.NUMBER)
    @Pkg(label = "Provide the interval to query in seconds", default_value =
"300", default_value_type = DataType.NUMBER)
    @GreaterThan("0")
    @NumberInteger
    @NotEmpty
    Double interval) {

    DataSource dataSource = getDataSource(driverClassName, jdbcUrl, userName,
password);

    TimerTask timerTask = new TimerTask() {

        @Override
        public void run() {
            logger.debug("checking DB");
            try {
                if(checkRecordsExist(dataSource.getConnection(), sqlQuery)){
                    consumer.accept(getRecordValue());
                    return;
                }
            } catch (SQLException e) {
                logger.warn(e.getMessage(), e);
                logger.warn("Trigger is still running.");
            }
            logger.debug("no records found");
        }
    };
}

```

```

    }
};

taskMap.put(this.triggerUid, timerTask);
TIMER.schedule(timerTask, interval.longValue(), interval.longValue());
}

private RecordValue getRecordValue() {
    List<Schema> schemas = new LinkedList<>();
    List<Value> values = new LinkedList<>();
    schemas.add(new Schema("triggerType"));
    values.add(new StringValue("DBStatus"));

    RecordValue recordValue = new RecordValue();
    recordValue.set(new Record(schemas, values));
    return recordValue;
}
/*
 * Cancel all the tasks and clear the map.
 */
@stopAllTriggers
public void stopAllTriggers() {
    taskMap.forEach((k, v) -> {
        if (v.cancel()) {
            taskMap.remove(k);
        }
    });
}

/*
 * Cancel the task and remove from the map
 *
 * @param triggerUid
 */
@stopListen
public void stopListen(String triggerUid) {
    if (taskMap.get(triggerUid).cancel()) {
        taskMap.remove(triggerUid);
    }
}

    public static DataSource getDataSource(String driverClassName, String
url, String userName, SecureString password) {
        BasicDataSource ds = new BasicDataSource();
        ds.setDriverClassName(driverClassName);
        ds.setUrl(url);
        ds.setUsername(userName);
        ds.setPassword(password.getInsecureString());
        return ds;
    }

    public static boolean checkRecordsExist(Connection con, String query)
        throws SQLException {

        Statement stmt = null;
        try {
            stmt = con.createStatement();
            ResultSet rs = stmt.executeQuery(query);
            rs.last();
            if(rs.getRow() > 0)
                return true;
        } catch (SQLException e) {
            throw new BotCommandException("Problem running statemnt", e);
        } finally {

```

```

        if (stmt != null) { stmt.close(); }
    }
    return false;
}
public String getTriggerUid() {
    return triggerUid;
}
public void setTriggerUid(String triggerUid) {
    this.triggerUid = triggerUid;
}
public Consumer getConsumer() {
    return consumer;
}
public void setConsumer(Consumer consumer) {
    this.consumer = consumer;
}
}
}

```

### Example: Event-based triggers - Push mechanism

The trigger waits for an event to occur, for example, a message listener to start listening.

- An event details are stored in the memory and a message listener waits for a message.
- When the event occurs, it runs the `consumer.accept(<RecordValue Instance>)` method and triggers an associated bot.

The following example shows how to create a simple `ActiveMQ` message listener (`SimpleMessageListenerContainer`) to demonstrate the trigger push mechanism.

```

@BotCommand(commandType = BotCommand.CommandType.Trigger)
@CommandPkg(label = "JMS Trigger", description = "JMS Trigger", icon =
    "jms.svg", name = "jmsTrigger",
    return_type = RECORD, return_name = "TriggerData", return_description =
    "Available keys: triggerType")
public class JMSQueue implements SessionAwareMessageListener {

    // Map storing multiple MessageListenerContainer
    private static final Map<String, MessageListenerContainer> taskMap = new
    ConcurrentHashMap<>();

    @TriggerId
    private String triggerUid;
    @TriggerConsumer
    private Consumer consumer;

    //This method is called by MessageListenerContainer when a message arrives.
    // At this point, the trigger get enabled
    @Override
    public void onMessage(javax.jms.Message message, Session session) throws
    JMSEException {
        consumer.accept(getRecordValue());
    }

    private RecordValue getRecordValue() {
        List<Schema> schemas = new LinkedList<>();
        List<Value> values = new LinkedList<>();
        schemas.add(new Schema("triggerType"));
        values.add(new StringValue("JMSQueue"));
    }
}

```

```

RecordValue recordValue = new RecordValue();
recordValue.set(new Record(schemas, values));
return recordValue;
}
/*
 * Starts the trigger.
 *
 * Use this method to setup the trigger, such as, setup the
MessageListenerContainer and start it.
 */
@StartListen
public void startTrigger(@Idx(index = "1", type = AttributeType.TEXT)
@Pkg(label = "Provide the broker URL")
@NotEmpty
String brokerURL, @Idx(index = "2", type = AttributeType.TEXT)
@Pkg(label = "Provide the queue name")
@NotEmpty
String queueName) {

    if (taskMap.get(triggerUid) == null) {
        synchronized (this) {
            if (taskMap.get(triggerUid) == null) {
                SimpleMessageListenerContainer messageListenerContainer = new
SimpleMessageListenerContainer();
                messageListenerContainer.setConnectionFactory(new
PooledConnectionFactory(brokerURL));
                messageListenerContainer.setDestinationName(queueName);
                messageListenerContainer.setMessageListener(this);
                messageListenerContainer.start();
                taskMap.put(triggerUid, messageListenerContainer);

            }
        }
    }

}

/*
 * Cancel all the tasks and clear the map.
 */
@StopAllTriggers
public void stopAllTriggers() {
    taskMap.forEach((k, v) -> {
        v.stop();
        taskMap.remove(k);
    });
}

/*
 * Cancel the tasks and remove from the map
 *
 * @param triggerUid
 */
@StopListen
public void stopListen(String triggerUid) {
    taskMap.get(triggerUid).stop();
    taskMap.remove(triggerUid);
}

public String getTriggerUid() {
    return triggerUid;
}

public void setTriggerUid(String triggerUid) {

```

```

    this.triggerUid = triggerUid;
}

public Consumer getConsumer() {
    return consumer;
}

public void setConsumer(Consumer consumer) {
    this.consumer = consumer;
}
}

```

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Add an iterator in a custom package for `Loop` action

Add an iterator in your package for `Loop` action.

### Add an iterator to a `Loop` action

- To create an iterator, set `commandType` property of `BotCommand` annotation with value as `Iterator`.
- There are two methods required by iterator, and they are defined by `HasNext`, and `Next` annotations.

```

@BotCommand(commandType = BotCommand.CommandType.Iterator)
@CommandPkg(name = "loop.iterators.files",
    label = "For each file in folder",
    node_label = "for each file and assign file name and extension to
    {{returnTo}}",
    description = "Iterator for each file in folder.",
    return_type = DataType.DICTIONARY,
    return_sub_type = DataType.STRING,
    return_required = true,
    return_description = "Note: Access the 'name' key to access file
    name and 'extension'
    key to access the file extension.",
    return_label = "Assign file name and extension to this variable")
public class FileLoop extends AbstractCommandFileIterator {

    @Idx(index = "1", type = AttributeType.TEXT)
    @Pkg(label = "Folder path")
    @Inject
    @NotEmpty
    private String folderPath;

    @HasNext
    public boolean hasNext() {
        return getFileIterator(folderPath).hasNext();
    }

    @Next
    public Value<?> next() {
        Map<String, Value> returnValueMap = new HashMap<>();

        FileIterator fileIterator = getFileIterator(folderPath);
        String fileName = fileIterator.getNext();
    }
}

```

```

        returnValueMap.put(FILE_NAME, new
StringValue(fileIterator.getFileName(fileName)));
        returnValueMap.put(EXTENSION, new
StringValue(fileIterator.getExtension(fileName)));

        return new DictionaryValue(returnValueMap);

    }

    public void setFolderPath(String folderPath) {
        this.folderPath = folderPath;
    }
}

```

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Add debug logs of custom packages to **bot\_launcher.log** file

You can add logs using `log4j`. The dependency is already added in the package SDK sample `build.gradle` file. Review the logging info using `RadioTypeDemo.java` file.

### Example 1: Logger info - Get region value using `RadioTypeDemo` class

1. Review the code example where the logger is added in the code, open the `RadioTypeDemo.java` file located at `<your latest package-sdk-2.0.9\src\main\java\com\automationanywhere\botcommand\samples\commands\basic\types`

```

@BotCommand
@CommandPkg(label = "[[RadioTypeDemo.label]]",
description = "[[RadioTypeDemo.description]]", icon = "sample.svg", name
= "radioTypeDemo")
public class RadioTypeDemo {

    private static Logger logger =
    LogManager.getLogger(RadioTypeDemo.class);

    @Execute
    public void getRegionValue(@Idx(index = "1", type = AttributeType.RADIO,
options = {
        @Idx.Option(index = "1.1", pkg = @Pkg(label =
"[[RadioTypeDemo.region.1.1.label]]", value = "us_east")),
        @Idx.Option(index = "1.2", pkg = @Pkg(label =
"[[RadioTypeDemo.region.1.2.label]]", value = "us_west")),
        @Idx.Option(index = "1.3", pkg = @Pkg(label =
"[[RadioTypeDemo.region.1.3.label]]", value = "us_central"))
    })
    @Pkg(label = "[[RadioTypeDemo.region.label]]")
    @NotEmpty
    String region) {
        logger.info("Selected region is {}", region);
    }
}

```

2. Build a simple bot from the Automation 360 Demo package and select a radio group: **Radio Demo**.
3. Select an appropriate region, such as, US East.
4. Save and run the bot.
5. Access the folder where the logs were generated, the default log location: `C:\ProgramData\AutomationAnywhere\BotRunner\Logs\Bot_Launcher.log`.

If the logs get roll back from the `Bot_Launcher.log` file, then logs will create a folder based on the month when they were created, for example, 2021-May. Inside this folder, the logs will continue to generate.

- Open the `Bot_Launcher.log` file and review the log info for the **RadioTypeDemo** and **selected region is us\_east**.

## Example 2: Assigning a value to clipboard

The following example accepts a user input or a variable and assigns it to clipboard.

```
@BotCommand
@CommandPkg(label = "Copy to", icon="assigntoclipboard.svg" , name =
  "assignToClipboard", description
    = "Accepts user input or a variable and assigns it to Clipboard",
  node_label="{{value}}")
public class AssignToClipboard {

  private static Logger logger =
    LogManager.getLogger(AssignToClipboard.class);

  @Execute
  public static void assign(@Idx(index = "1", type = TEXT) @Pkg(label =
    "Value") @NotEmpty String
    value) {

    logger.trace("Assigning '{}' value to clipboard.", value);
  }
}
```

## Related concepts

[How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Handle sessions in a custom package

You can extract a session using a session name from the *SessionsMap*. In the same package, you can use sessions to pass information between actions, but not to other packages.

## Configure the following attributes

- Apply an annotation to the class field and add a corresponding public setter.
- Retrieve the *SessionsMap* using the *Sessions* attribute.
- Set the variable type as *Map<String, Object>*.
- Set the *attributeType*: `TEXT` or `SESSION`. If `type = TEXT`, it is a regular session; if `type = SESSION`, it is a `sharedSession`.

## Start a new session

```
@BotCommand
@CommandPkg(label = "Start session", name = "startSession", description =
  "Start new session",
```

```

icon = "pkg.svg", node_label = "start session {{sessionName}}|") public
class Start {

    @Sessions
    private Map<String, Object> sessions;

    @Execute
    public void start(@Idx(index = "1", type = TEXT) @Pkg(label = "Session
name",
    default_value_type = STRING, default_value = "Default") @NotEmpty String
sessionName) {

        // Check for existing session
        if (sessions.containsKey(sessionName))
            throw new
BotCommandException(MESSAGES.getString("xml.SessionNameInUse",
sessionName));

        // Do some operation

        // Create new session
        sessions.put(sessionName, new Session(operation));
    }
    public void setSessions(Map<String, Object> sessions) {
        this.sessions = sessions;
    }
}

```

## End a session

```

@BotCommand
@CommandPkg(label = "End session", name = "endSession", description = "End
session", icon =
"pkg.svg", node_label = "End session {{sessionName}}|")
public class EndSession {
    @Sessions
    private Map<String, Object> sessions;
    @Execute
    public void end(
        @Idx(index = "1", type = TEXT) @Pkg(label = "Session name",
default_value_type = STRING,
        default_value = "Default") @NotEmpty String sessionName) {

        sessions.remove(sessionName);
    }
    public void setSessions(Map<String, Object> sessions) {
        this.sessions = sessions;
    }
}

```

## Add a session

In the below example, string objects are used (although in real actions, you can use complex objects).

```
@BotCommand
@CommandPkg(label = "[[SessionDemo.label]]", description =
  "[[SessionDemo.description]]", icon = "sample.svg", name = "sessionDemo")
public class SessionDemo {

  // Sessions are provided as a Map. Actions can add or remove entries in
  this
  // Map.
  // The choice to reuse/overwrite/delete/add any Object in this Map belongs
  to
  // the actions, and the framework makes no assumption regarding it.
  @Sessions
  private Map<String, Object> sessionMap;

  @Execute
  public void execute(@Idx(index = "1", type = TEXT)
    @Pkg(label = "[[SessionDemo.name.label]]")
    @NotEmpty
    String name) {
    if (!sessionMap.containsKey(name))
      sessionMap.put(name, "Some Value");
  }

  // Ensure that a public setter exists.
  public void setSessionMap(Map<String, Object> sessionMap) {
    this.sessionMap = sessionMap;
  }
}
```

## Set a session variable

The below example shows how to develop an action (for example, Set session variable). In the action, the session details are retrieved and stored as a session variable so that the information can be used within a specific package.

```
@BotCommand
@CommandPkg(label = "[[SessionDemo2.label]]", description =
  "[[SessionDemo2.description]]", icon = "sample.svg", name = "SessionDemo2",
  return_type = DataType.STRING)
public class SessionDemo2 {

  // Sessions are provided as a Map. Actions can add or remove entries in
  this
  // Map.
  // The choice to reuse/overwrite/delete/add any Object in this Map belongs
  to
  // the actions, and the framework makes no assumption regarding it.
  @Sessions
  private Map<String, Object> sessionMap;

  @Execute
  public Value<?> execute(@Idx(index = "1", type = TEXT)
```

```

@Pkg(label = "[[SessionDemo2.name.label]]")
@NotEmpty
String name) {
    if (sessionMap.containsKey(name)) {
        return new StringValue(sessionMap.get(name));
    }
    return new StringValue("session does not exist");
}
// Ensure that a public setter exists.
public void setSessionMap(Map<String, Object> sessionMap) {
    this.sessionMap = sessionMap;
}
}

```

## Related concepts

### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

## Configure shared session attributes using Package SDK

Create new Package SDK files and modify existing files to configure a variable, command, and the attribute type to share details between TaskBots.

## Add session type to the package template

Open the package template file located at <latest package sdk zip file>\src\main\resources and add `sessionType: label` and an optional description.

```

{
  "name": "A2019DemoPackage",
  "label": "[[label]]",
  "description": "[[description]]",
  "sessionType" : {
    "label" : "testdemo",
    "description" : "sharedSessionDemo"
  },
  "group": "",
  "artifactName": "",
  "packageVersion": "",
  "codeVersion": "",
  "author": "",
  "commands": []
}

```

## Create a new custom variable

Create a new `DemoForSession` file and place it at the following location: <latest package sdk zip file>/src/main/java/com/automationanywhere/botcommand/samples/commands/basic

Using the file, create the custom variable (*Dto* class) to share details between TaskBots and implement the *CloseableSessionObject* variable.

```

package com.automationanywhere.botcommand.samples.commands.basic;
import
    com.automationanywhere.toolchain.runtime.session.CloseableSessionObject;
import java.io.IOException;
public class DemoForSession implements CloseableSessionObject

```

```

{
    public void setClose(boolean close) {
        this.close = close;
    }
    boolean close=false;
    public String getDemo() {
        return demo;
    }
    public void setDemo(String demo) {
        this.demo = demo;
    }
    public DemoForSession(String demo){
        this.demo=demo;
    }
    String demo;
    @Override
    public boolean isClosed() {
        return close;
    }
    @Override
    public void close() throws IOException {
    }
}

```

## Create a new command

Using the `DemoForSession` file, develop a command that retrieves the `SharedSessionDemoUpperCaseParent` from the public `sessionMap` and assigns it to `sessionMap` object.

```

package com.automationanywhere.botcommand.samples.commands.basic;
import com.automationanywhere.botcommand.data.Value;
import com.automationanywhere.botcommand.data.impl.SessionValue;
import com.automationanywhere.botcommand.data.impl.StringValue;
import com.automationanywhere.commandsdk.annotations.*;
import com.automationanywhere.commandsdk.annotations.rules.NotEmpty;

import java.util.Map;

import static com.automationanywhere.commandsdk.model.AttributeType.TEXT;
import static com.automationanywhere.commandsdk.model.DataType.SESSION;
import static com.automationanywhere.commandsdk.model.DataType.STRING;

@BotCommand
@CommandPkg(return_label = "SharedSessionDemoUpperCaseParent",
    node_label = "SharedSessionDemoUpperCaseParent", label
    = "SharedSessionDemoUpperCaseParent", description
    = "SharedSessionDemoUpperCaseParent", name =
    "SharedSessionDemoUpperCaseParent", return_type = SESSION, return_required
    = true)
public class SharedSessionDemoUpperCaseParent {

    public void setSessionMap(Map<String, Object> sessionMap) {
        this.sessionMap = sessionMap;
    }
    @Sessions
    private Map<String, Object> sessionMap;

    @Execute
    public Value<?> execute(@Idx(index = "1", type = TEXT)

```

```

        @Pkg(label = "SetSession", description =
"SetSession", default_value = "Default", default_value_type = STRING)
        @NotEmpty
        String session) {
            Object sessionObject = sessionMap.get(session);

            System.out.println("sessionObject: "+sessionObject);
            SessionValue sessionValue=new SessionValue((DemoForSession)
sessionObject);
            sessionValue.set(session);
            return sessionValue;
        }
    }
}

```

## Configure the attributeType. Session

In the *SharedSessionDemoUpperCaseChild* file, configure the *attributeType.Session* for the *sharedSession* parameter.

```

@Idx(index = "3", type = AttributeType.SESSION)
@Pkg(label = "sharedSession", description = "sharedSession",
    default_value = "Default", default_value_type = DataType.SESSION)
    SharedSessionDemoUpperCaseChild session

```

### Related concepts

#### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

### Related tasks

#### [Build bots to share session details using Package SDK](#)

A shared session enables you to reuse actions between TaskBots that run concurrently, for example, using the same Excel file to pass values.

## Build bots to share session details using Package SDK

A shared session enables you to reuse actions between TaskBots that run concurrently, for example, using the same Excel file to pass values.

Ensure you have the following to build a TaskBot:

- Access to the Control Room
- Credentials with **AAE\_Basic** permissions
- A development license, which enables you to create and run TaskBots
- Your workstation is a registered device in the Control Room
- An Excel file that you want to use in the shared session actions

1. Log in to the Control Room.
2. Create three TaskBots that will share the shared session actions.
3. Create a new *childSession2* variable of **Type > Session** and **Session type > MS Excel session**, select **Use as input**, and then click **Apply**.
4. Go to **Bots > My bots**, and click the **Create a bot** icon.
5. Create a new bot called *childBot2*.
  - a) In the **Name** field, enter *childBot2*.

- b) In the Actions pane, find **Excel Advanced**, and drag **Get current worksheet name** to the Bot editor.
  - c) In **Session name** > **Shared session**, enter **F2** > **childSession2**, and in **Assign the output to variable**, select **prompt-assignment**.
6. Create a new *parentSession* variable of **Type** > **Session** and **Session type** > **MS Excel session**, and then click **Apply**.
  7. Create a new bot called *parentSession*, and click **Create & Edit**.
  8. In the Actions pane, find **Excel Advanced**, and drag **Open** to the Bot editor.
    - a) In **File path**, select **Desktop file**, click **Browse**, and navigate to the Excel file that you want to use.
    - b) In **Session name**, retain **Default**.
    - c) Click **Save**.
  9. Create a new *childSession1* variable of **Type** > **Session** and **Session type** > **MS Excel session**, select **Use as input**, and then click **Apply**.
  10. Create a new bot called *childBot1*.
    - a) In the **Name** field, enter *childBot1*.
    - b) In the Actions pane, find **Excel Advanced**, and drag **Get single cell** to the Bot editor.
    - c) Select **Active cell** in **Session name**, and select **Local name**, enter **F2**, and then in **Store cell content to**, select **prompt-assignment**.
  11. In the Actions pane, find **Excel Advanced**, and drag **Set session variable** to the Bot editor.
    - a) In **Session name**, retain **Default**.
    - b) In **Save session to a variable**, select **parentSession**.
  12. From the Actions pane, find **Task Bot**, and drag **Run** to the Bot editor.
    - a) In **Task Bot to run**, select **Control Room file**, click **Choose**, and then **Browse**, and select **childBot1**.
    - b) In **Input values**, select **Set childSession1**, enter **F2**, and select **parentSession**.
  13. In the Actions pane, find **Excel Advanced**, and drag **Close**, select **Session name** as **Local name**, and retain **Default**.
  14. In the Actions pane, find **Message box**. In **Enter the message to display**, enter **F2**, and then select **prompt-assignment**.
  15. From the Actions pane, select **Task Bot**, and drag **Run** to the Bot editor.
    - a) In **Task Bot to run**, select **Control Room file**, click **Choose**, and then **Browse**, and then select **childBot2**.
    - b) In **Input values**, select **Set childSession2**, enter **F2**, and select **childSession1**.
  16. In the Actions pane, find **Message box**. In **Enter the message to display**, enter **F2**, and select **prompt-assignment**.
  17. Save all three bots and run the **parentSession** TaskBot.

The following three messages are displayed:

```
Single cell value from parent bot:1
```

Current worksheet name of excel opened in parent bot: Sheet1 <name of the sheet>

Your bot has run successfully!

### Related concepts

#### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

### Related reference

#### [Configure shared session attributes using Package SDK](#)

Create new Package SDK files and modify existing files to configure a variable, command, and the attribute type to share details between TaskBots.

## Annotations

This section provides reference information about the annotations used to create Automation Anywhere packages.

- [Creation and function annotations](#)

List of the available creation and function annotations.

- [Validation annotations](#)

Validates annotated strings and values used in the Java code.

- [Configure and use credential allow password annotation](#)

Use the provided **CredentialTypeDemo.java** package SDK file and configure the **CredentialAllowPassword** annotation for the password field in Automation 360 locker actions.

### Related concepts

#### [Standard coding practices and guidelines for developing packages](#)

This topic covers standard coding practices and guidelines that help to ensure the development of high quality packages.

#### [How to examples](#)

This section contains code examples and explanations about how to code some basic bot capabilities.

### Related tasks

#### [Set up the Java project](#)

Set up an integrated development environment (IDE) for Java, including Automation Anywhere custom annotations to develop an action package that you can upload to your Control Room.

#### [Develop a sample package](#)

Develop your own package and upload it to an Control Room to provide custom actions for bots.

## Creation and function annotations

List of the available creation and function annotations.

### Annotation: BotCommand

Makes the type eligible to be treated as an `action`. You can define three types of actions **commandType** property.

- Command\Action
- Condition
- Iterator

**Examples:**

- `@BotCommand(commandType = BotCommand.CommandType.Iterator)`
- `@BotCommand(commandType = Condition)`
- `@BotCommand(commandType = Variable)`
- `@BotCommand(commandType = Trigger)`

**Annotation: CommandPkg**

Makes the type eligible for creation of action `package.json`. This annotation must be used with `BotCommand` to take effect. `Pkg` participates in the activity only when this annotation is present.

**Example:**

```
@CommandPkg(label = "Create", name = "createFile",
description = "Creates a file", node_label = "{{filePath}}",
icon = "file.svg")
```

**Annotation: ConditionTest**

Participates in the `Condition` execution. This annotation can only be used when the `BotCommand` has `commandType` set as `Condition`. Only one method needs to be annotated when `BotCommand` annotation is present on the type. Failure to do so will result in the compilation error.

**Annotation: Execute**

Participates in the execution of `BotCommand`. Exactly one method needs to be annotated when `BotCommand` annotation is present on the type. Failure to do so will result in the compilation error.

**Example:**

```
@Execute public void create( @Idx(index = "1", type = FILE) @LocalFile
@Pkg(label =
"File", description = "e.g. C:\\MyDoc\\MyFile.doc") @NotEmpty String
filePath,
@Idx(index = "2", type = CHECKBOX) @Pkg(label = "Overwrite an existing
file")
@NotEmpty Boolean isOverwrite) { createFile(filePath, isOverwrite); }
```

**Annotation: GlobalSessionContext**

Can only be applied to member variables and fetches the `GlobalSessionContext` through a setter.

**Example:**

```
@com.automationanywhere.commandsdk.annotations.GlobalSessionContext
private GlobalSessionContext globalSessionContext;

public void setSessionMap(Map < String, Object > sessionMap) {
    this.sessionMap = sessionMap;
}
public void
setGlobalSessionContext(com.automationanywhere.bot.service.GlobalSessionContext
globalSessionContext) {
```

```
this.globalSessionContext = globalSessionContext;
}
```

## Annotation: HasNext

Participates in the execution of `Iterator`. This annotation can only be used when the `BotCommand` has `commandType` set as `Iterator`. Requires the `Next` annotation to be present. One method needs to be annotated when `BotCommand` annotation is present on the type. Failure to do so will result in the compilation error.

## Annotation: Index

Makes the annotated element part of hierarchy utilized for the code and resource generation. Without this annotation no `BotCommand` related element annotations would be processed.

## Annotation: Idx.Option

An option represents the elements that would play in the hierarchy, but lend the values to the parents.

### Examples:

- RADIO

```
@Idx(index = "1", type = RADIO, options = {
    @Idx.Option(index = "1.1", pkg = @Pkg(node_label
        = "[[Delay.delayType.1.1.node_label]]", label =
        "[[Delay.delayType.1.1.label]]", value = REGULAR)),
    @Idx.Option(index = "1.2", pkg = @Pkg(node_label
        = "[[Delay.delayType.1.2.node_label]]", label =
        "[[Delay.delayType.1.2.label]]", value = RANDOM))
})
@Pkg(label = "[[Delay.delayType.label]]", default_value = "REGULAR",
    default_value_type = DataType.STRING)
@Inject
private String delayType;
```

- SELECT

```
@Idx(index = "2", type = SELECT, options = {
    @Idx.Option(index = "2.1", pkg = @Pkg(label =
        "[[LaunchWebsite.browser.2.1.label]]", value = "DEFAULT")),
    @Idx.Option(index = "2.2", pkg = @Pkg(label =
        "[[LaunchWebsite.browser.2.2.label]]", value = "INTERNET_EXPLORER")),
    @Idx.Option(index = "2.3", pkg = @Pkg(label =
        "[[LaunchWebsite.browser.2.3.label]]", value = "FIREFOX")),
    @Idx.Option(index = "2.4", pkg = @Pkg(label =
        "[[LaunchWebsite.browser.2.4.label]]", value = "CHROME"))
}) @Pkg(label = "[[LaunchWebsite.browser.label]]", default_value =
    "DEFAULT", default_value_type = DataType.STRING) @NotEmptyStringbrowser)
```

## Annotation: Inject

Makes an element eligible for injection into the annotated type object. The injection is setter-based so a corresponding setter in the type is **mandatory**. The injected values would form the **BotCommand** parameter map using the name provided in **idx**.

## Annotation: Next

Participates in the **Iterator** execution. This annotation can only be used when the **BotCommand** has **commandType** set as **Iterator**. Requires the **HasNext** annotation to be present. One method needs to be annotated when **BotCommand** annotation is present on the type. Failure to do so will result in compilation error.

## Annotation: Pkg

Makes an element to participate in the **package.json** creation. This annotation is ignored when **idx** is not present.

### Related concepts

#### [Annotations](#)

This section provides reference information about the annotations used to create Automation Anywhere packages.

## Validation annotations

Validates annotated strings and values used in the Java code.

Annotation	Description
<b>CodeType</b>	The MIME-type of the code to format.
<b>CredentialOnly</b>	Can only accept a credential value, no string allowed.
<b>Equals</b>	Validates that the given string is equal to the annotated string variable.
<b>FileExtension</b>	Validates the annotated string value that ends with the supported extension type.
<b>GreaterThan</b>	Validates that the annotated number variable value is always greater than the given numeric value.
<b>GreaterThanEqualTo</b>	Validates that the annotated number variable value is always greater than or equal to the given numeric value.
<b>LessThan</b>	Validates that the annotated number variable value is always less than the given numeric value.
<b>LessThanEqualTo</b>	Validates that the annotated number variable value is always less than or equal to the given numeric value.

Annotation	Description
<b>LocalFile</b>	Can only accept local paths and no file expression.
<b>MatchesRegex</b>	Validates that the annotated string value matches the given regular expression.
<b>NotEmpty</b>	Validates and throws an exception when the annotated variable value is null.  <pre>@Execute public Value&lt;Double&gt;length(@Idx(index="1", type=TEXT)@Pkg(label="Source string")@NotEmpty String sourceString) {}</pre>
<b>NotEquals</b>	Validates that the given string is not be equal to the annotated string variable.
<b>NotMatchesRegex</b>	Validates that the annotated string value does not match the given regular expression.
<b>NumberInteger</b>	Ensures the UI accepts only integers and not double for the annotated variable value.
<b>RepositoryFile</b>	Can only accept repository paths and no file expression.
<b>VariableNotPackage</b>	Cannot choose a variable from this package.
<b>VariablePackage</b>	Can only choose a variable from this package.
<b>VariableSubType</b>	The variable subtype must match.
<b>VariableType</b>	The variable type must match.
<b>VariableUserDefined</b>	Can only choose a user-defined variable.

## Related concepts

### [Annotations](#)

This section provides reference information about the annotations used to create Automation Anywhere packages.

## Configure and use credential allow password annotation

Use the provided **CredentialTypeDemo.java** package SDK file and configure the **CredentialAllowPassword** annotation for the password field in Automation 360 locker actions.

### Example: Review the CredentialTypeDemo.java

Use the following **CredentialTypeDemo.java** file located at: <latest package-sdk>2.0.9\src\main\java\com\automationanywhere\botcommand\samples\commands\basic\types as an example on how to configure the credential attribute.

```
@BotCommand
@CommandPkg(label = "[[CredentialTypeDemo.label]]",
description = "[[CredentialTypeDemo.description]]", icon = "sample.svg",
name = "credentialTypeDemo")
public class CredentialTypeDemo {
```

```
private static Logger logger =
LogManager.getLogger(CredentialTypeDemo.class);

/**
 * To accept credentials the {@link AttributeType} in index should be
 * {@link AttributeType.CREDENTIAL CREDENTIAL}. A {@link SecureString} is
 * provided for any credentials type.
 */
@Execute
public void printCredentials(@Idx(index = "1", type =
AttributeType.CREDENTIAL)
@Pkg(label = "[[CredentialTypeDemo.credentials.label]]")
SecureString credentials) {
// SecureString provides multiple way to access the data inside.
// Let's try to get the user name and print it in logs.

// To get the username as String
String userName = credentials.getInsecureString();
logger.trace("User name from getInsecureString : {}", userName);
}
```

### Example: Configure the credential attributes @Execute

Configure the index, type, label, optional description, and the credentialAllowPasswordAttribute. When creating a new or updating an existing package, use the **CredentialAllowPassword** annotation to allow the credential picker to pick a credential attribute marked as a password field.

```
@Execute
public void printCredentials(@Idx(index = "2", type =
AttributeType.CREDENTIAL)
@Pkg(label =
"[[CredentialTypeDemo.credentialsAllowPasswordAttribute.label]]")
@CredentialAllowPassword SecureString credentialAllowPasswordAttribute) {
}
```

### Configure the attributes in the Control Room

In the **Attribute name** field, enter `password` and an optional **description**, in **Input** field, select **Standard**, and enter the `Value`. In the **Security** field, select **Use attribute only on Password or Masked fields**.

### Use the credential attribute in Control Room

- In the **Pick a credential** field, select **credential**. In the **Attribute** field, select **username**. In the **Provide the credential for the user (optional)** field, select **Credential**, and then **Pick**.
- In the **Attribute** field, select **password**. In the **Provide the credential for the password (optional)** field, select **Credential**, and then **Pick**.

## Build and test a demo package and bot

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

Here is a list of all the necessary tasks to create a package, add the package to your Control Room, and verify your work in a bot. Complete the listed tasks in order.

**Tip:** Click the title of each step to go the detailed task.

**Step 1** [Update related workflow and build files](#)

Follow the detailed steps for updating workflow and build files for this project using your integrated development environment (IDE).

**Step 2 Choose your favorite IDE**

You can compile a package from the IDE of your choice. Here are two possible ways you can compile a package:

[Compile a demo JAR file from the Eclipse UI](#)

Use Eclipse to compile a demo JAR file that you can add as a package to your Control Room.

[Compile a demo JAR file from the command line](#)

Compile the demo Java code provided with this software development kit.

**Step 3** [Add your demo package to an Control Room](#)

Users with **Upload package** permission can add packages to the Control Room for use by all Bot Creators.

**Step 4** [Create a demo bot with the demo package](#)

Create a bot using the demo package to verify the actions that were created.

**Step 5** [Change the Java file used to create the package JAR file](#)

Modify and compile the Java code used to create a package to fix issues and create new functionality.

**Step 6** [Upload new demo package](#)

Package management allows you to upload package updates. The new package has the same name, but a different version number.

**Step 7** [Update the demo bot with the updated package](#)

Update bots to use specific package versions.

## Update related workflow and build files

Follow the detailed steps for updating workflow and build files for this project using your integrated development environment (IDE).

Complete all the steps for project setup detailed in [Set up the Java project](#).

This task shows you how to update the appropriate build and workflow files.

1. Open the project "A2019DemoPackage" that you created in [Set up the Java project](#).  
You can find the project file in the directory where you extract the zip files to, for example `c:\A2019DemoPackage`.
2. From inside the project, Open the **settings.gradle** file.
3. Replace the project name with `A2019DemoPackageFirstnameLastname`.  
If your name is John Developer it would look like this, `A2019DemoPackageJohnDeveloper`.
4. Open **src > main > resources > package.template**.

## 5. Update the **name**, **label**, and **description** values.

Original package.template	Updated package.template
<pre>{   "name": "A2019DemoPackage",   "label": "A2019DemoPackage",   "description": "Provides actions for A2019DemoPackage operations.",   "group": "",   "artifactName": "",   "packageVersion": "",   "codeVersion": "",   "commands": [] }</pre>	<pre>{   "name": "A2019DemoPackageFirstnameLastname",   "label": "A2019DemoPackageFirstnameLastname",   "description": "A2019DemoPackageFirstnameLastname",   "group": "",   "artifactName": "",   "packageVersion": "",   "codeVersion": "",   "commands": [] }</pre>

## 6. Save the changes.

After you have setup the build files, you need to compile the demo Java code, [Compile a demo JAR file from the command line](#).

## Compile a demo JAR file from the Eclipse UI

Use Eclipse to compile a demo JAR file that you can add as a package to your Control Room.

Before starting this task complete the steps in [Update related workflow and build files](#).

Build a package file using a Gradle project in the Eclipse IDE.

1. Import the A2019DemoPackage as a Gradle project, **File > Import > Gradle > Existing Gradle Project** and click **Finish**.
2. From the **Gradle Tasks** tab, go to **<your project> > build** and run the following tasks in order.
  - a) **<your project> > build > clean**
  - b) **<your project> > build > build**
3. From the **Gradle Tasks** tab, go to **<your project.> shadow** and run the **shadowJar** task.
 

Your compiled package file is located in **file:\ \A2019DemoPackage\build\libs\**. The package file has named after your project name (**<your project>-1.0.0.jar**).

To add your custom package to your Control Room follow the instructions in [Add packages to the Control Room](#).

### Related concepts

[Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

## Compile a demo JAR file from the command line

Compile the demo Java code provided with this software development kit.

Before starting this task complete the steps in [Update related workflow and build files](#).

1. Open a terminal window and go to where the **gradlew.bat** file is located.
 

```
... \A2019DemoPackage > gradlew.bat
```

2. In the terminal window, type `gradlew.bat clean build shadowJar`, and press **Enter**. Here is an example of what you see:

```
> . . .\A2019DemoPackage>gradlew.bat clean build shadowJar

> Task :compileJava
Note: Starting hierarchy discovery for
'com.automationanywhere.botcommand.demo.Concatenate'
Note: Starting non-hierarchical element discovery for
'com.automationanywhere.botcommand.demo.Concatenate'
Note: Starting hierarchy discovery for
'com.automationanywhere.botcommand.demo.Uppercase'
Note: Starting non-hierarchical element discovery for
'com.automationanywhere.botcommand.demo.Uppercase'
Note: Starting Command Java generator...
Note: Starting Json generator...
Note: Generating command json for Concatenate
Note: Generating command json for Uppercase

> Task :commandCodeGen
mergeJsonFiles: updatePackage: group com.automationanywhere ,
artifactName A2019DemoPackageFirstnameLastname ,
packageVersion 1.0.0-20190816-101906
```

The compiled file is located in **file:\ \A2019DemoPackage\build\libs\**.

To add your custom package to your Control Room follow the instructions in [Add packages to the Control Room](#).

### Related concepts

[Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

## Add your demo package to an Control Room

Users with **Upload package** permission can add packages to the Control Room for use by all Bot Creators.

Before you can upload a package, you need valid user login credentials with **Upload package** permission for the Control Room you are adding the package to.

1. Navigate to **Bots > Packages**.
2. Click **Add package**.
3. Click **Browse**.
4. Locate and select the package to add to the Control Room.  
Packages are Java Archive (JAR) files that contain actions used to create bots.
5. Click **Upload package**.
6. On the **Bots > Packages > Confirm package** page, choose any of the following options:
  - **Accept, enable and set as default:** Uploads and enables the selected package, and sets it to the default package for the Control Room.
  - **Accept and enable:** Uploads and enables the package, but the package is not set as the default package. Bot Creators have to specifically select non-default packages to use them for creating bots.

Choosing **Reject** stops the upload process.

7. After installation, click **Administration > Packages** to verify that the package is added.

After successfully uploading your demo package, create a bot to test the actions you just created. For detailed step about how to create a bot, read [Create a demo bot with the demo package](#)

## Create a demo bot with the demo package

Create a bot using the demo package to verify the actions that were created.

Here are the minimum prerequisites for building this demo bot:

- Access to a Control Room
- User credentials with **AAE\_Basic** permission
- Your local host (workstation) is a registered device in the Control Room
- Ensure that the demo package **A2019DemoPackageFirstnameLastname** is available in the Control Room

This task uses the following actions and components:

- Uppercase (demo package)
- [Message box](#)
- [Variables overview](#)

1. Go to **Bots > My bots** and click the **My Task Bot** icon.
2. Type `MyDemoBot1` in the **Name** field.
3. Click **Create & Edit**.
4. Expand **A2019DemoPackageFirstnameLastname** and double **Uppercase**.
5. Type `hello world, go be great!` in all lower case letters.
6. Create the variable `vMyDemoVar1`.
7. Click **Apply**.
8. Add a **Message box** and insert the variable **vMyDemoVar1** in the **Enter the message to display** field.
9. Click **Apply** and **Save**.
10. Click the **Run** icon.

A message box with "HELLO WORLD, GO BE GREAT!" in all upper case letters is displayed. The custom action **Uppercase** converted all the letters from lower case letters to upper case letters.

The task, [Change the Java file used to create the package JAR file](#), gives instruction on how to modify the **Uppercase** action to convert all upper case letters to lower case letters.

## Change the Java file used to create the package JAR file

Modify and compile the Java code used to create a package to fix issues and create new functionality.

1. Open the project "A2019DemoPakcage."
2. From inside the project, open **src/main/java/com.automationanywhere.botcommand.samples.commands/basic/Uppercase** .

### 3. Change the function from upper case to lower case.

Original function	Updated function
<pre>String result =   "ALL".equals(caseType) ?    sourceString.toUpperCase() :   (sourceString     .substring(0,   1).toUpperCase() +   sourceString     .substring(1));</pre>	<pre>String result =   "ALL".equals(caseType) ?    sourceString.toLowerCase() :   (sourceString     .substring(0,   1).toUpperCase() +   sourceString     .substring(1));</pre>

### 4. Save the changes and re-compile the package.

You can now upload the changed package to the Control Room. [Upload new demo package](#)

#### Related tasks

[Upload new demo package](#)

Package management allows you to upload package updates. The new package has the same name, but a different version number.

## Upload new demo package

Package management allows you to upload package updates. The new package has the same name, but a different version number.

You need **AAE\_Basic** permissions to create and edit bots.

1. From the **Bots > Packages** page, click the **Add package** icon.
2. **Browse** to the location of the package to add.  
Packages are Java Archive (JAR) files that contain actions used to create bots.
3. Select the package to add, and click **Upload package**.
4. On the **Bots > Packages > Confirm package** page, click **Accept, enable and set as default**.

You can select specific packages to be used from within a bot. Read detailed steps about managing packages for specific bots in [Update the demo bot with the updated package](#) task.

## Update the demo bot with the updated package

Update bots to use specific package versions.

- Access to the bot created in the task [Create a demo bot with the demo package](#).
- **AAE\_Basic** permission.

1. Go to **Bots > My bots** and double-click **MyDemoBot1**, the demo bot you created in an earlier task.
2. Click the **vertical eclipses** in the upper right corner and click **Packages**.
3. Expand the row for the package **A2019DemoPackageFirstnameLastname**.
4. From the drop-down list of package versions, select the **Default** version.  
Because you added the updated package as the default version, you are selecting the new version of the package you created.
5. Click **Change Version** and **Save**.
6. Go to **Bots > My bots** and double-click **MyDemoBot1**.

7. Click **A2019DemoPackageFirstnameLastname** and type `HELLO WORLD, GO BE GREAT!` in the **Source string** field.
8. Click **Apply** and **Save**.
9. Click the **Run** icon.  
The message box displayed by the bot displays "hello world, go be great!" This verifies that the action from the updated package is being used.

## Build and test a custom package

Use IntelliJ to build a custom package and use Automation 360 actions to test the package.

Complete the following tasks to create a custom package, upload the package to your Control Room, and build a bot to test it. After you update the IntelliJ files, create directories, and create and update java classes, you can build the custom package.

1. *Create and build a custom package using IntelliJ*

Use IntelliJ to import the Automation Anywhere SDK, create a new package, and compile a JAR file that you can upload to your Control Room.

2. *Add custom package to your Control Room*

Use the compiled JAR file and upload it to the Control Room.

3. *Create a bot to test the custom package*

Use Automation 360 actions to create a bot to test the custom package.

---

**Note:** The customer support team does not provide guidance for the code written by customers.

---

**See also:** [Create custom packages](#)

---

## Create and build a custom package using IntelliJ

Use Java IntelliJ to compile a JAR file that you can upload as a package to your Control Room in Automation 360.

A basic understanding of JDK and Java IntelliJ is required in order to build an action package. Ensure the following software and files:

- [Java SE Development Kit 11 Downloads](#)
- Java IDE [Community edition of IntelliJ](#)
- Automation Anywhere A2019 SDK. Download and extract the zip files for the release you require: [Enterprise A2019 Package Development Kit Release Notes](#)

1. Unzip the contents of the SDK package to your `IdeaProjects` directory and rename the folder from `A2019-package-sdk-<version number>` to `MetricToImperial`.  
By default, the package is located at: `C:\Users\<User>\IdeaProjects`.
2. In IntelliJ IDEA, go to **File > Open** and open the project at `C:\Users\<User>\IdeaProjects\MetricToImperial`.
3. Open the `settings.gradle` file in the project root. Set the `rootProject.name = 'MetricToImperial'`
4. Update the `package.template` file located at `src > main > resources > package.template`.
5. Change the package name from `A2019DemoPackage` to `MetricToImperial`.

6. Update the package name in **locales json**: go to **src > main > resources > locales > en\_US.json**.
  - a) Open the **en\_US.json** file and update the **required** label field from A2019DemoPackage to MetricToImperial. Update the optional description.
  - b) Delete all other remaining lines in the **en\_US.json** file.
7. Create a new **Java Class**, right-click the `metricctoimperial.commands` package, and select **New > Java Class**. Enter the name for the new class `CMtoINCH`:
  - a) Open the **CMtoINCH** class. Copy and paste the following code above the class definition statement:

```
import static com.automationanywhere.commandsdk.model.DataType.NUMBER;
//BotCommand makes a class eligible for being considered as an action.
@BotCommand
//CommandPks adds required information to be disalable on GUI.
@CommandPkg(
    //Unique name inside a package and label to display.
    name = "CM to Inch", label = "[[CMtoINCH.label]]",
    node_label = "[[CMtoINCH.node_label]]", description =
    "[[CMtoINCH.description]]", icon = "ruler_icon.svg",
    //Return type information. return_type ensures only the right
    kind of variable is provided on the UI.
    return_label = "[[CMtoINCH.return_label]]", return_type =
    NUMBER, return_required = true)
```

- b) Inside the **CMtoINCH** class, copy and paste the following code:

```
//Identify the entry point for the action. Returns a Value<String>
because the return type is String.
@Execute
public NumberValue action(
    //Idx 1 would be displayed first, with a text box for entering
    the value.
    @Idx(index = "1", type = AttributeType.NUMBER)
    //UI labels.
    @Pkg(label = "[[CMtoINCH.CMInput.label]]")
    //Ensure that a validation error is thrown when the value is
    null.
    @NotEmpty
    Double CMInput) {
    //Internal validation, to disallow empty inputs. No null check needed
    as we have NotEmpty on CMInput.
    if (!"".equals(CMInput.toString().trim()))
        throw new BotCommandException("Input of CM is required");
    Number result;
    try {
        //Conversion logic
        result = CMInput * 0.393701;
    } catch (Exception e) {
        //Throw custom error message
        throw new BotCommandException("Unable to convert " +
        CMInput.toString() + "cm to inches");
    }
    //Return NumberValue.
```

```
return new NumberValue(result);
```

The code automatically imports namespaces based on the annotations and datatypes.

To manually import namespaces, select a highlighted line, and press these keys simultaneously alt and the enter key.

8. Configure **en\_US.json** file, go to **src > main > resources > locales > en\_US.json** and add the following fields after the label and description values:

```
"CMtoINCH.label" : "cm to inches",
"CMtoINCH.node_label": "cm to inches",
"CMtoINCH.description" : "Convert centimeters to inches",
"CMtoINCH.return_label" : "Assign the Output in Inches to a Number
Variable",
"CMtoINCH.CMInput.label" : "Centimeters to Convert to Inches"
```

9. Delete the sample packages, go to **src > main > java > com.automationanywhere.botcommand**, and delete the `samples.commands` and delete the `samples` packages.
10. Update the `CommandPkg` annotation. Download icons from Github.
  - a) Download `ruler_icon.svg` from [github](#) and right-click the image and save the image as `ruler_icon.svg`.
  - b) Download `iconwhite.svg` from [github](#), right-click the image and save the image `iconwhite.svg`.
  - c) Copy both files into the **src > main > resources > icons** folder.
11. Open the `build.gradle` in the project root. After the dependencies section, but before the last closing tag, copy and paste the following code:

```
test {
    testLogging {
        exceptionFormat = 'full'
    }
    useTestNG() {}

    afterSuite { desc, result ->
        if (!desc.parent)
            println("${result.resultType} " +
                "${result.testCount} tests, " +
                "${result.successfulTestCount} successes, " +
                "${result.failedTestCount} failures, " +
                "${result.skippedTestCount} skipped)")
    }
    maxHeapSize "3g"
}
```

12. Create a new directory, right-click **src** and select **New > Directory**.
  - a) In the **Name** field, enter `test\java`, or select the **test\java** suggestion from the **Gradle Source Sets**.
  - b) Create a new package, right-click the `java` directory and select **New > Package**.
  - c) Enter the name for the newly created package:  
`com.automationanywhere.botcommand.metrictoimperial.commands`.

- 13.** Create new Java class, right-click and select **New > Java Class**. Enter the name for the new class `CMtoINCHTest`.

Inside the `CMtoINCHTest` class, copy and paste the following code:

```
@Test
public void testCMtoINCH(){
    Double validInput = 10.00;
    Double expectedOutput = 0.393701 * validInput;
    CMtoINCH testCM = new CMtoINCH();
    Value<Double> result = testCM.action(validInput);
    Assert.assertEquals(result.get(), expectedOutput);
}
```

- 14.** Save the project **File > Save All**.

- 15.** Build the package.

You can use the IntelliJ UI or the command line. If you are using the command line:

- a) Open a terminal window and navigate to the `MetricToImperial` directory and enter: `cd "%USERPROFILE%\IdeaProjects\MetricToImperial"`
- b) To build the project, enter the following command: `gradlew.bat clean build shadowJar`

A `BUILD SUCCESSFUL` message appears.

Sometimes a build might fail because existing files could not be automatically deleted and a system message appears indicating the execution failed for the task: `clean`. If this occurs, close the explorer windows and run the build again.

#### *Add custom package to your Control Room*

### Add custom package to your Control Room

Use the compiled JAR file and upload it as a package to your Control Room in Automation 360.

- Complete the steps in [Create and build a custom package using IntelliJ](#).
  - Ensure you have the following:
    - Access to the Control Room.
    - Credentials with **AAE\_Basic** permission or a custom role with permissions to add packages to the Control Room.
- 1.** From Windows Explorer, go to `C:\Users\<<Username>\IdeaProjects\MetricToImperial\build\libs` and locate `MetricToImperial-1.0.0.jar`.
  - 2.** Log in to your Control Room as a user with permissions to add a new package.
  - 3.** Click **BOTS > Packages**.
  - 4.** In the **All packages** page, move your mouse over the plus sign and click **Add package**.
  - 5.** In the **Add package** page, click **Browse** and locate the `MetricToImperial-1.0.0.jar` file. By default, the file is located at: `C:\Users\<<Username>\IdeaProjects\MetricToImperial\build\libs`.
  - 6.** Select the `MetricToImperial-1.0.0.jar` file and click **Open**.
  - 7.** Click **Upload Package**.

#### *Create a bot to test the custom package*

#### **Related concepts**

#### [Build and test a custom package](#)

Use IntelliJ to build a custom package and use Automation 360 actions to test the package.

**Related tasks**[Add custom package to your Control Room](#)

Use the compiled JAR file and upload it as a package to your Control Room in Automation 360.

[Create a bot to test the custom package](#)

Use the actions in Automation 360 to create a bot and test the custom package.

**Create a bot to test the custom package**

Use the actions in Automation 360 to create a bot and test the custom package.

Ensure you have the following to build the bot:

- Access to the Control Room.
- Credentials with **AAE\_Basic** permission or with a custom role to build a bot.
- Your workstation is a registered device in the Control Room.
- Your package **MetricToImperial-1.0.0.jar** is available in the Control Room.

1. Log in to the Control Room.
2. Go to **Bots > My bots**, and click the **Create a bot** icon.
3. In the **Name** field, enter `MetricToImperialTest`.
4. Click **Create & Edit**.
5. In the Actions pane, find **Metric to Imperial** and drag **Convert centimeters to inches** into the bot flow.
  - a) In the **CM to Convert** field, enter 1.
  - b) Click **Create variable** (next to the **Output** field) to create a new number variable.
  - c) In **Create Variable**, enter `nInchesOutput` and click **Create & Select**.
  - d) Click **Apply**.
6. In the Actions pane, find the **Number** package and drag the **To String** command below **Convert centimeters to inches**.
  - a) In the **Enter a number** field, enter **F2** and select **nInchesOutput**.
  - b) In the **Enter number of digits after decimal** field, enter 5.
  - c) In the **Assign the output to variable** field, select **prompt-assignment - String** from the drop-down list.
  - d) Click **Apply**.
7. From the Actions pane, drag **Message box**, click **F2** and insert the **prompt-assignment variable**.
8. In the **Enter the message to display** field, click **F2** and select the **prompt-assignment variable**.
9. Click **Apply** and **Save**.
10. Click **Run**.  
The bot displays the `0.39370` message, which is a successful build.

**Related concepts**[Build and test a custom package](#)

Use IntelliJ to build a custom package and use Automation 360 actions to test the package.

**Related tasks**[Create and build a custom package using IntelliJ](#)

Use Java IntelliJ to compile a JAR file that you can upload as a package to your Control Room in Automation 360.

[Add custom package to your Control Room](#)

Use the compiled JAR file and upload it as a package to your Control Room in Automation 360.

## Automation 360 Package Development Kit Release Notes

These release notes describe new, changed, fixed, deprecated features, and security fixes, as well as known issues and limitations for the Automation 360 Package Development Kit.

### Enhancements A2019.21

Feature	Description
Added the new annotation	Added the new annotation for the Control Room and the Bot agent.
Added the new annotation	Added the new annotation for the credential password (@CredentialAllowPassword).
Added the new example	Added the new example at: <code>botcommand/samples/commands/basic/types</code> , called <b>CredentialTypeDemo.java</b> file.
Added the new annotation	Added the new annotation to support the Trigger3 interface.
Updated trigger examples	Updated trigger examples to support the Trigger3 interface.
Runtime library updates	Bundled latest bot runtime libraries.

[A2019-package-sdk-2.1.0](#)

### Enhancements A2019.20

Feature	Description
Runtime library updates	Bundled latest bot runtime libraries.

[A2019-package-sdk-2.0.9](#)

### Enhancements A2019.19

Feature	Description
Runtime library updates	Bundled latest bot runtime libraries.
Added annotation rule	Added the <code>MultipleRecordPicker</code> annotation rule.
Added annotations	Added annotations for desktop operation stages.

[A2019-package-sdk-2.0.8](#)

## Enhancements A2019.18

Feature	Description
Runtime library updates	Bundled latest bot runtime libraries.
Added shared session	Added support for shared sessions.
Enhanced property creation	Now properties can accept one parameter.
Added rule for WindowResize and WindowBrowser	Added a new rule for WindowResize and WindowBrowser.
Non-essential dependencies in the <code>build.gradle</code> are commented out	Non-essential dependencies in the <code>build.gradle</code> are now commented out. Enable it to compile the Package SDK samples.

[A2019-package-sdk-2.0.7](#)

## Enhancements A2019.17

Feature	Description
Runtime library updates	Bundled latest bot runtime libraries.
Add the author name in custom packages	Added support to add the author name in the vendor column of custom packages.
Added File2 attribute	Added the new attribute type File2.
Added File Type rule	Added the new rule File Type.

[A2019-package-sdk-2.0.6](#)

## Enhancements A2019.16

Feature	Description
Runtime library updates	Bundled latest bot runtime libraries.
Added NoLogging	Added NoLogging support.

[A2019-package-sdk-2.0.5](#)

## Enhancements A2019.15

Feature	Description
Runtime library updates	Bundled latest bot runtime libraries.

[A2019-package-sdk-2.0.4](#)

## Enhancements A2019.14

Feature	Description
Desktop operations	Added desktop operations support.
Samples for actions in the download file	Added additional samples for actions in the Package SDK download file.
Runtime library updates	Bundled latest bot run-time libraries.

[A2019-package-sdk-2.0.3](#)

## Enhancements A2019.13

Feature	Description
Time validation for locales	Added compile time validation for locales JSON file.
Entry list	Added support for ENTRYLIST
Runtime library updates	Bundled latest bot runtime libraries.

[A2019-package-sdk-2.0.2](#)

## Enhancements A2019.12.1

Feature	Description
Trigger samples	Added trigger samples in the Package SDK download file. Download the latest Package SDK to access the sample files.

[A2019-package-sdk-2.0.1.zip](#)

## Enhancements A2019.12

Feature	Description
Runtime libraries	Added the latest runtime libraries.
Custom trigger	Creating custom triggers is supported in this release.
Sample	We added more code samples.
<b>HierarchyDemo.java</b> code example added to package documentation. (Service Cloud case ID: 00469066)	Create a simple action with multiple choices. The UI differs based on the options selected.

[A2019-package-sdk-2.0.0.zip](#)

## Enhancements A2019.11

Feature	Description
Runtime libraries	This package contains the latest runtime libraries.

[A2019-package-sdk-1.0.11.zip](#)

## Enhancements A2019.10

Feature	Description
Updated annotation support	Added new attributes annotation support.
Improved bundling of SDK	Bundled java doc inside package SDK zip. You only need to download one zip file now.
Runtime libraries	Bundled latest bot runtime libraries.
More examples	Added new examples inside zip.
Datatypes	Added new datatypes.

[A2019.10-package-sdk-1.0.0.zip](#)

---

**Note:** All the components for the Package SDK are included in a single zip file starting with the A2019.10 release.

---

## Enhancements A2019.09

Feature	Description
Bot runtime libraries	Bundled latest bot runtime libraries for A2019.09 Package SDK.

- SDK Demo Package: [A2019.09-packageSDK-1.0.0.zip](#)
- Documentation: [A2019.09-package-annotations-javadoc.zip](#)

## Enhancements A2019.08

Feature	Description
Bot runtime libraries	Bundled latest bot runtime libraries for A2019.08 Package SDK.
Properties support	Extended support for properties.
Comments expanded and improved	Added more comments to sample commands to help use SDK.

Feature	Description
Comment field formatting	Added text color and background color to comment fields.

- SDK Demo Package: [A2019.08-packageSDK-1.0.0.zip](#)
- Documentation: [A2019.08-package-annotqations-javadoc.zip](#)

## Enhancements A2019.07

Feature	Description
Bot runtime libraries	The A2019.07 bot runtime libraries are bundled in the SDK package.
<b>CREDENTIAL</b> attribute	We provide support for credential attributes that require input from action screens.
Localized error messages and actions UI text	Enables developing packages with i18n error messages and localized (l10n) actions UI with localized text.
Java Development Kit 11	The A2019.07 Package Development Kit supports JDK 11.

- SDK Demo Package: [A2019.07-Package-Sdk-1.0.0.zip](#)
- Documentation: [A2019.07-package-annotations-javadoc.zip](#)

## Build a bot using REST Web Services and JavaScript actions

Use the Azure Cognitive Text Analytics API to get a subscription key and use the REST API and Automation 360 JavaScript actions to build a bot.

Complete the following tasks to create a resource to get a subscription key, and use the Automation 360 REST Web Services and JavaScript actions to build the bot. After you create a resource and deploy it, you will get a subscription key. Use the subscription key to create a variable and use Automation 360 actions to build the bot.

### 1. *Set up the Azure portal*

Use the Azure Cognitive Text Analytics API to create a resource, get a subscription key, and then use a Reference API to send a POST request.

### 2. *Build a bot to parse JSON response using JavaScript*

Use the subscription key created in the Microsoft Azure to build a bot to parse the JSON response using Automation 360 REST Web Services and JavaScript actions.

## Set up Azure portal

Use the Azure Cognitive Text Analytics API to create a resource, get a subscription key, and then use a Reference API to send a POST request.

Create an account with [Azure Cognitive Services](#).

1. Log in to your Azure account and click **Portal**.
2. Search and select **Text Analytics** from the drop-down list.
3. Click **Create a Resource**:
  - a) Enter a **Name**: TextAnalyticsDemo2020.
  - b) Select the **Subscription**--use the default Azure subscription 1, select the **Location**, for example West US, and select the **Pricing tier**, for example F0 (5K Transactions per 30 days).
  - c) Create a **Resource Group** and provide a name, for example, TextAnalyticsDemo2020RG.
  - d) Click **Create**.  
When the **Overview** window opens, you should be able to see the following status: Your Deployment is complete.
4. Go to your resource TextAnalyticsDemo2020 and select it.  
You should see: TextAnalyticsDemo2020 | **Quick Start**.
5. From section 1, copy the **K1** contents, for example, 0abfa73d93f1469d9d4b5db459394315.  
The **Text Analytics API (v.2.1)** page opens.
6. From section 2, click the API Console (V2) link:
  - a) Select **API Reference > POST Sentiment**.
  - b) In **Sentiment**, Select the testing console in the region where you created your resource:, select **West US**.  
The **Text Analytics API (v.2.1) Sentiment** page opens.
  - c) In the **Headers** section, enter the value **Ocp-Apim-Subscription-Key** that you copied from the **K1** field.
  - d) In the **Request body**, delete the existing content and replace it with the following code:

```
{
  "documents": [
    {
      "language": "en",
      "id": "1",
      "text": "I love this world"
    }
  ]
}
```

- e) Click **Send**.  
The response status is displayed as 200 OK. The Response content field shows:  
{ "documents": [{ "id": "1", "score": 0.96714282035827637 }], "errors": [] }.

*Build a bot to parse JSON response using JavaScript*

## Build a bot to parse JSON response using JavaScript

Use the subscription key created in the Microsoft Azure to build a bot to parse the JSON response using Automation 360 REST Web Services and JavaScript actions.

Ensure you have the following to build the bot:

- Created an account in the Azure portal and have the subscription key available.

*Set up Azure portal*

- Access to the Control Room or Community Control Room
- Your workstation is a registered device in the Control Room.

1. Log in to the Control Room.
2. Go to **Bots > My bots**, and click the **Create a bot** icon.
3. In the **Name** field, enter `API_Sentiment_Score_Bot`.
4. Click **Create & Edit**.
5. From the Actions pane, click **Variables** to create a new variable:
  - a) In the **Name** field, enter `sURI`.
  - b) In the **Type** field, select **String**.
  - c) In the **Default value** field, access your previously created resource and paste the value here: <https://westus.api.cognitive.microsoft.com/text/analytics/v2.1/sentiment>.
  - d) Click **Create**.
6. Create a new **Variable**:
  - a) In the **Name** field, enter `sSubscriptionKey`.
  - b) In the **Type** field, select **String**.
  - c) In the **Default value** field, paste the value from the **K1** field: `0abfa73d93f1469d9d4b5db459394315`.
  - d) Click **Create**.
7. From the Actions pane, select **REST Web Services > Post method** and place it at the **Start** of the bot.
  - a) In the **URI** field, select `$$URI$` and click **Yes, insert**.
  - b) In the **Authentication Mode** drop-down list, select **No Authentication**.
  - c) Click **Header > Custom Headers > (Add)**:
    1. In the **Name** field, enter `Ocp-Apim-Subscription-Key`.
    2. In the **Value** field, select `$$sSubscriptionKey$` and click **Yes, Insert**.
  - d) In the **Content type** drop-down list, select **JSON (application/json)**.
  - e) In **Custom Parameters**, enter the following code:

```
{
  "documents": [
    {
      "language": "en",
      "id": "1",
      "text": "I love this world"
    }
  ]
}
```

```
}

```

- f) Create a new *dResponse* variable of **Type > Dictionary** and **Subtype > String**.
  - g) In the **Assign the output to a variable** drop-down list, select **dResponse -Dictionary of Strings**.
  - h) Click **Create & Select**.
8. From the Actions pane, drag **Message box** to the bot. In the **Enter the message to display** field, select **dResponse -Dictionary of Strings**, and click **Yes, insert**.
  9. Create a new *sOutput* variable of **Type > String**.
  10. From the Action pane, click **Dictionary > Get**.
    - a) In the **Dictionary variable** drop-down list, select **dResponse -Dictionary**.
    - b) In the **Key** field, enter `Body`.
    - c) In the **Assign the output to a variable** drop-down list, select **sOutput -String**.
  11. Create a new *IParseOutput* variable of **Type > List** and **Subtype > String**.
  12. Create a new *sSentimentValue* variable of **Type > String**.
  13. From the Action pane, click **List > Add item**.
    - a) In the **List variable** drop-down list, select **IParseOutput -List**.
    - b) In the **Item to be added** drop-down list, select **sOutput -String**.
    - c) In the **Add Item** field, select **To end of list**.
  14. From the Action pane, click **JavaScript > Open**.
    - a) In the **JavaScript session** field, select **Default**.
    - b) In **JavaScript**, select **Manual input** and enter the following script:
 

```
function extractValue(list) {var output = JSON.parse(list);return output.documents[0].score;}
```
  15. From the Action pane, click **JavaScript > Run JavaScript**.
    - a) In the **JavaScript session**, select **Default**.
    - b) In the **Enter name of function to be executed**, enter `extractValue`.
    - c) In the **Parameters** drop-down list, select **IParseOutput - List**.
    - d) In the **Assign the output to variable** drop-down list, select **sSentimentValue - String**.
  16. From the Actions pane, drag **Message box** to your bot.
    - a) In the **Enter the message to display** field, enter: `Sentiment score: $sSentimentValue $.`
  17. Click **Save** and click **Run**.  
The following message appears: `Your bot has run successfully!Sentiment score: 0.9671428203582764`

## Post to Salesforce through custom app with OAuth 2.0

Create a Salesforce custom app to get authentication credentials and use the Automation 360 REST Web Service and String Operation actions to build a bot. After creating the app, you will get the authentication credentials. Use the credential values to create variables and build a bot using the Automation 360 actions.

### 1. *Create a custom app with OAuth 2.0 for authentication*

Create a custom app in Salesforce and get the access token to interact with REST APIs, and then use REST Web Service and String Operation actions to build a bot.

### 2. *Build a bot using REST web services and String actions*

Use the access token created in the custom app and build a bot using the REST Web Service and String Operation actions.

## Create a custom app with OAuth 2.0 for authentication

Create a custom app in Salesforce and get the access token to interact with REST APIs.

Ensure you have the following to build the bot:

- A basic knowledge of REST API and an understanding of OAuth concepts.
- An account created in Salesforce and a user name and password available.

*Salesforce Developers*

### 1. Log in to Salesforce and click **Switch to Lightning Experience**.

### 2. Click your **Profile** image and click **Settings**.

### 3. On the left side, click **Reset My Security Token**.

After resetting the token action, a new token is sent to your registered email.

### 4. Check your email and save the security token.

### 5. In the Salesforce application, click **Home**, and search and select **App manager**.

### 6. Click **New Connected App**:

a) In the **Connected App Name** field, enter `OAuth_Validation_App`.

b) In the **Contact Email** field, enter your email.

c) In the **API** section, select **Enable OAuth Settings**.

d) In the **Callback URL** field, enter `no:callbackURL`.

e) In the **Selected OAuth Scopes**, select **Access and manage your data (api)**.

f) Click **Add** and verify that the **Access and manage your data (api)** is shown on the right side.

g) Click **Save**.

A system message is displayed: Allow from 2-10 minutes for your changes to take effect on the server before using the connected app.

h) Wait until the changes are applied and then click **Continue**.

### 7. When the **OAuth\_Validation\_Apppage** is displayed, go to the **API** section and copy the **Consumer Key** and **Consumer Secret** values. If it is hidden, select **Click to reveal** and copy the **Consumer Secret** key.

### 8. Click **Manage** and validate the **OAuth Policies**: verify that the **Permitted Users** field includes **All users may self-authorize**. If not, click **Edit Policies** and select **All users may self-authorize**.

**9. Click Save.**

You can build a bot using the values from the OAuth\_Validation\_App, such as, ClientId = Consumer Key, ClientSecret = Consumer Secret, SecurityToken, and your Salesforce user name and password.

*Build a bot using REST web services and String actions***Build a bot using REST web services and String actions**

Use the custom app authentication to generate the access token to interact with Salesforce REST APIs and build a bot using the Automation 360 REST Web Service and String Operation actions.

Ensure you have the following to build the bot:

- Created a connected app and credentials available.

*Create a custom app with OAuth 2.0 for authentication*

- Access to the Control Room or Community Control Room
- Your workstation as a registered device in the Control Room.

1. Log in to the Control Room.
2. Go to **Bots > My bots**, and click the **Create a bot** icon.
3. In the **Name** field, enter `ConnectToAPIwithOAuth`.
4. Click **Create & Edit**.
5. In the Actions page, click **Variables** to create a new variable:
  - a) In the **Name** field, enter `sClientId`.
  - b) In the **Type** field, select **String**.
  - c) In the **Default value** field, paste the value from the **Consumer Key** field of the OAuth validation app.
  - d) Click **Create**.
6. Create a new `sClientSecret` variable, **Type > String, Default value > Consumer Secret**, paste the value.
7. Create a new `sUserName` variable, **Type > String, Default value > enter the Salesforce login user name**.
8. Create a new `sPassword` variable, **Type > String, Default value > enter the Salesforce login password**.
9. Create a new `sSecurityToken` variable, **Type > String, Default value > Security Token**, paste the value.
10. Create a new `dResponse` variable, **Type > Dictionary** and **Subtype > String**.
11. Create a new `sExtractedValue` variable, **Type > String**.
12. From the Actions pane, select **REST Web Services > Post method** and place it under the **Start** of the bot flow.
  - a) In the **URI** field, enter `https://ap17.salesforce.com/services/oauth2/token?grant_type=password&client_id=${sClientId}&client_secret=`

```
$sClientSecret&username=$sUsername&password=$sPassword$
$sSecurityToken$. Replace ap17 with your Salesforce instance number.
```

- b) In the **Authentication Mode** drop-down list, select **No Authentication**.
  - c) In the **Content type** drop-down list, select **JSON (application/json)**.
  - d) In the **Assign the output to a variable** drop-down list, select **dResponse - Dictionary of Strings**.
- 13.** From the Actions pane, drag **Message box** to the bot flow. In the **Enter the message to display** field, enter `$dResponse{Body}$`.
- 14.** From the Action pane, click **String > Extract Text**.
- a) In the **Source string** field, enter `$dResponse{Body}$`.
  - b) In the Before or after **Start after text**, enter `"access_token": "`, **Occurrence**, enter 1, select **AND, End before text**, enter `", "`, **Occurrence**, enter 1. **If no match found, return**, select **Source String, Number of characters to get**, select **All**, click **Trim the extracted text (remove blank spaces)**, and click **Remove Enter from the extracted text**.
  - c) In the **Assign the output to a variable** drop-down list, select **sExtractedValue - String**.
- 15.** From the Actions pane, drag **Message box** to the bot flow. In the **Enter the message to display** field, enter `$sExtractedValue$`.
- 16.** From the Actions pane, select **REST Web Services > Post method**.
- a) In the **URI** field, enter `https://ap17.salesforce.com/services/data/v36.0/subjects/Account`. Replace ap17 with your Salesforce instance number.
  - b) In the **Authentication Mode** drop-down list, select **No Authentication**.
  - c) Click **Header > Custom Headers > (Add)**:
    1. In the **Name** field, enter `Authorization`.
    2. In the **Value** field, enter `Bearer $sExtractedValue$`.
  - d) In the **Content type** drop-down list, select **JSON (application/json)**.
  - e) In **Custom Parameters**, enter the following code:
 

```
{
  "Name" : "Text passed through A2019 REST API"
}
```
  - f) In the **Assign the output to a variable** drop-down list, select **dOutput -Dictionary of Strings**.
- 17.** From the Actions pane, drag **Message box**. In the **Enter the message to display** field, enter `$dOutput{Body}$`.
- 18.** From the Action pane, select **String > Extract text**.
- a) In the **Source string** field, enter `$dOutput{Body}$`.
  - b) In the Before or after **Start after text**, enter `"id": "`, **Occurrence**, enter 1, select **AND, End before text**, enter `", "`, **Occurrence**, enter 1. **If no match found, return**, select **Source String, Number of characters to get**, select **All**, click **Trim the extracted text (remove blank spaces)**, and click **Remove Enter from the extracted text**.
  - c) In the **Assign the output to a variable** drop-down list, create a new `sURLValue` by clicking the plus sign, **Type > String**.
  - d) Click **Create & Select**.

- 19.** From the Actions pane, drag **Message box**. In the **Enter the message to display** field, enter  `${URLValue}` .  
A message from the bot displays a URL value  `0014R00002gIcsZQAS` . Use the value to validate the data in your Salesforce account:  `https://<yourinstance>.salesforce.com/<sURLValue>` .  
For example:  `https://ap17.salesforce.com/0014R00002gIcsZQAS` .

## Use Python to build a bot to parse JSON response

Use the Automation 360 Python script to execute Python functions to build a bot. Use the Python functions to parse the JSON response from a REST Web Services GET request.

Ensure you have the following to build the bot:

- Basic understanding of Python programming language.
- Basic experience with creating Automation Anywhere bots.
- Download and install Python 3.

*[download Python](#)*

Add a path to the Environment variable, and select **Add Python 3.8 to PATH** during the Python installation.

- 1.** Log in to the Control Room.
- 2.** Go to **Bots > My bots**, and click the **Create a bot** icon.
- 3.** In the **Name** field, enter  `PythonTutorial` .
- 4.** Click **Create & Edit**.
- 5.** In the Actions pane, click **Variables** to create the following new variables:
  - a) Name  `dResponse` , **Type > Dictionary** and **Subtype > String**.
  - b) Name  `dRetrieveValue` , **Type > Dictionary** and **Subtype > Any**.
  - c) Name  `sResponseBody` , **Type > String**.
  - d) Name  `sFullName` , **Type > String**.
  - e) Name  `sLocation` , **Type > String**.
  - f) Name  `sTotalUserCount` , **Type > String**.
  - g) Name  `nTotalUserCount` , **Type > Number**.
  - h) Name  `nCurrentUser` , **Type > Number**.
  - i) Name  `sCurrentUser` , **Type > String**.
- 6.** From the Actions pane, select **REST Web Services > Get method** and place it under the **Start** of the bot flow.
  - a) In the **URI** field, enter  `https://randomuser.me/api/?results=5&inc=name,email,location&nat=us` .  
This is a sample API that returns random user details to the calling application.
  - b) In the **Authentication Mode** drop-down list, select **No Authentication**.
  - c) In the **Assign the output to a variable** drop-down list, select **dResponse -Dictionary of Strings**.

7. From the Actions pane, click **String > Assign**.
  - a) In the **Select the source string variable value** field, enter `$dResponse{Body}$`.
  - b) In the **Assign the output to a variable** drop-down list, select **dResponseBody - String**.
8. From the Actions pane, click **Python script > Open**.
  - a) In the **Python** field, select **Manual input**.
  - b) In the **Enter script here** field, copy and paste the following code.

```
import json

def get_node_count(response):
    #parse response as json
    response_dict=json.loads(response)
    # Create list from JSON body
    response_body = response_dict['results']
    #return the count of entries in JSON body as string
    lengthasString = str(len(response_body))
    return lengthasString

def get_full_name(dictRequest):
    itemCount = int(dictRequest['count'])
    #parse response as json
    response_dict=json.loads(dictRequest['response'])
    # Create list from JSON body
    response_body = response_dict['results']
    #Extract values to return
    return response_body[itemCount]['name']['first'] + " " +
    response_body[itemCount]['name']['last']

def get_location(dictRequest):
    itemCount = int(dictRequest['count'])
    #parse response as json
    response_dict=json.loads(dictRequest['response'])
    # Create list from JSON body
    response_body = response_dict['results']
    #Extract values to return
    return response_body[itemCount]['location']['city'] + ", " +
    response_body[itemCount]['location']['state']
```

- c) In the **Python runtime version** field, retain the default value as **3**.
9. From the Actions pane, click **Python script > Execute function**.
  - a) In the **Python session** field, retain **Default**.
  - b) In the **Enter the name of function to be executed** field, enter `get_node_count`.
  - c) In the **Arguments to the function** drop-down list, select **dResponseBody - String**.
  - d) In the **Assign the output to a variable** drop-down list, select **sTotalUserCount - String**.
10. From the Actions pane, click **Dictionary > Put**.
  - a) In the **Dictionary variable** field, select **dRetrieveValue -Dictionary**.
  - b) In the **Associate to this key** field, enter `response`.
  - c) In the **New value** drop-down list, select **dResponseBody - String**.
  - d) In the **Assign previous value to a variable** drop-down list, select **prompt-assignment - String**.

11. From the Actions pane, click **String > To number**.
  - a) In the **Enter the string** field, enter `sTotalUserCount`.
  - b) In the **Assign the output to a variable** drop-down list, select **nTotalUserCount - Number**.
12. From the Actions pane, click **Loop > Loop**.
  - a) In the **Loop Type > Iterator**, select **For n times** from the drop-down list.
  - b) In the **times** field, enter `$nTotalUserCount$`.
  - c) In the **Assign the current value to a variable** drop-down list, select **nCurrentUser - Number**.
13. From the Actions pane, click **Number**, select **Decrement** and place it inside the **Loop** action.
  - a) In the **Enter number** field, enter `$nCurrentUser$`.
  - b) In the **Enter decrement value** field, enter `1`.
  - c) In the **Assign output to a variable** drop-down list, select **nCurrentUser - Number**.
14. From the Actions pane, click **Number**, select **To string** and place it inside of the **Loop** action, below **Number > Decrement**.
  - a) In the **Enter a number** field, enter `$nCurrentUser$`.
  - b) In the **Enter number of digits after decimal** field, enter `0`.
  - c) In the **Assign output to a variable** drop-down list, select **sCurrentUser - String**.
15. From the Actiond pane, click **Dictionary > Put** and place it inside of the **Loop** action.
  - a) In the **Dictionary variable** field, select **dRetrieveValue -Dictionary**.
  - b) In the **Associate to this key** field, enter `count`.
  - c) In the **New value** drop-down list, select **sCurrentUser - String**.
  - d) In the **Assign previous value to a variable** drop-down list, select **prompt-assignment - String**.
16. From the Actions pane, click **Python script > Execute function** and place it inside of the **Loop** action.
  - a) In the **Python session** field, retain **Default**.
  - b) In the **Enter the name of function to be executed** field, enter `get_full_name`.
  - c) In the **Arguments to the function** drop-down list, select **dRetrieveValue - Dictionary**.
  - d) In the **Assign the output to a variable** drop-down list, select **sFullName - String**.
17. From the Actions pane, click **Python script > Execute function** and place it inside of the **Loop** action.
  - a) In the **Python session** field, retain **Default**.
  - b) In the **Enter the name of function to be executed** field, enter `get_location`.
  - c) In the **Arguments to the function** drop-down list, select **dRetrieveValue - Dictionary**.
  - d) In the **Assign the output to a variable** drop-down list, select **sLocation - String**.

**18.** From the Actions pane, click **Message box** and place it inside of the **Loop** action.

a) In the **Enter the message to display** field, enter the following:

```
Full Name: $sFullName$ Location: $sLocation$
```

b) Select **Close message box after** > **Seconds**, enter 5.

**19.** From the Actions pane, click **Python script** > **Close** and place it outside of the **Loop** action.

a) In the **Python session** field, retain **Default**.

**20.** Click **Save** to save your bot, and then click **Run**.

The bot runs, displaying five full user names with locations for approximately 5 seconds each before completing its successful execution.

## Use JavaScript to build a bot to take user input

Use the JavaScript actions Automation 360 to execute JavaScript functions to build a bot. Use the actions to create a bot that takes user input and provides the appropriate output.

Ensure you have the following to build the bot:

- Basic understanding of JavaScript programming language.
- Basic experience with creating Automation Anywhere bots.

**1.** Log in to the Control Room.

**2.** Go to **Bots** > **My bots**, and click the **Create a bot** icon.

**3.** In the **Name** field, enter `Hello User`.

**4.** Click **Create & Edit**.

**5.** In the Actions pane, click **Variables** to create the following new variables:

a) Name `lInputList`, **Type** > **List** and **Subtype** > **String**.

b) Name `sInputName`, **Type** > **String**.

c) Name `sOutput`, **Type** > **String**.

**6.** From the Actions pane, click **Prompt** > **For value**:

a) In the **Prompt window capture** field, enter `Enter your name here`.

b) In the **Prompt message** field, enter `Please enter your name here`.

c) In the **Assign the output to a variable** drop-down list, select **sInputName - String**.

**7.** From the Actions pane, click **List** > **Add item**:

a) In the **List variable** drop-down list, select **lInputList - List**.

b) In the **Item to be added** drop-down list, select **sInputName - String**.

c) In the **Add item** field, select **To end of list**.

**8.** Create a new JavaScript file.

a) Open a notepad, and copy and paste the following code:

```
function response(str){
return "Hello "+ str
```

```
}

```

- b) Save the file in your desktop as `Salutation.js`, and select **Save as type:** as **All Files**.
- 9.** From the Actions pane, click **JavaScript > Open:**
    - a) In the **JavaScript session** field, leave as **Default**.
    - b) In **JavaScript > Import existing file**, for the **JavaScript file** field, select **Desktop file**.
    - c) Click **Browse** and select the `Salutation.js` file from your desktop or where you saved the file.
    - d) In the **Assign the output to a variable** drop-down list, select **sOutput - String**.
  - 10.** From the Actions pane, click **JavaScript > Run JavaScript:**
    - a) In the **Enter name of the function to be executed** field, enter `response`.
    - b) In the **Parameters** drop-down list, select **IInputList - List**.
  - 11.** From the Actions pane, click **Message box:**
    - a) In the **Enter the message to display** field, enter `$$sOutput$`.
  - 12.** Click **Save** to save your bot, and then click **Run**.
  - 13.** When the bot prompts to enter a name, enter the name and click **OK**.  
A message from the bot appears: `Hello <User>`.

## Bot developer recommendations

Automation Anywhere provides a flexible platform for bot and package development. The information in this topic provide guidelines and recommendations on how to structure and develop robust and reusable bots and packages.

## Bot Store submissions checklist

Use the checklist to ensure that your Automation 360 Bot Store submission is correctly created, processed, and accepted. If you do not follow requirements listed in the checklist, your submission will be rejected and will not be published on the Bot Store page.

Use this checklist from the developer portal: [Automation 360 bot submission checklist](#).

## Building reusable bots

Review the guidelines to gain a better understanding of how to develop bots or subtasks for reusability, from designing and creating through reusing.

### Define prerequisites, input, output, and variables

When you build bots for reusability, define the following:

- Document all necessary prerequisites on how to use your bot either on its own or as a subtask.
- When creating your bots, define values as input, output, or local. Input and output variables are used when your bot is designed to be used as a subtask, allowing it to receive and pass back values to or from another calling bot.

- Provide meaningful variable descriptions when defining input and output variables so that other developers know how to interact with your subtask.
- Adhere to an established standard for variable naming guidelines. Review the Automation Anywhere user-defined variables for variable naming guidelines. *Your variables (user-defined)*

### Follow single-responsibility principle

Bots developed for reusability should follow the single - responsibility principle which states that each subtask or component should have responsibility over a single part of the functionality of the overall bot and that responsibility should be entirely encapsulated by that subtask or component.

Other examples of single-responsibility:

- A subtask that processes a single transaction, but can be called multiple times for each transaction on a list.
- A subtask that collects screen display data on a single page of a website, but can be called multiple times as a bot goes through pagination.

### Bot design considerations

Consider the following patterns based on which templates must be developed for use:

#### 1. Master, Main, and Sub bots

- Master bot: This bot is called directly to begin the process, through mechanisms including scheduling through the Control Room or API call. Include the following major process steps in the **TRY** section:
  - a. Initial setup for the process.
  - b. Validation that the setup was successful. For example, check whether all required files and folders exist or initial variable values are populated as required.
  - c. Run the desktop **PRE-PROCESS CLEANUP**.
  - d. Call the main bot to run the business logic of the process.

In the **FINALLY** section, run the desktop **POST-PROCESS CLEANUP**.

- Main bot: This bot calls the sub bots as required to run the business logic of the

process. Include the following major process steps in the **TRY** section:

- a. Validation of any input. For example, input variable values from the master bot.
- b. Execution of sub bots.
- c. Validation of any output.
- d. Ensure population of any output variable values based on the execution of main bot, to return to the master bot.

In the **CATCH** section, log the error, and ensure population of any output variable values, for example, **oStrResult** to pass back to the master bot.

- Sub bots
  - A sub bot is called by the master bot or main bot to run the actual business logic required for the automation. They are also referred to as helper tasks or utility tasks because their only purpose is to assist the calling task.
  - Use output variables to return a result indicator to the calling bot either main, or another sub bot. For example, **outStrResult**. The value contains an error message if the processing was not successful due to an error or exception that had occurred.

2. Main and Sub bots: This pattern includes the master and the main bot in a single main bot. The design pattern of the Sub bot is similar to the design pattern explained above.

## Opening and closing applications

Any applications, files, or windows that a bot or subtask opens must be closed by the same bot or subtask.

- For example, when a bot opens Microsoft Excel to perform a spreadsheet operation, verify that the spreadsheet and Excel are closed when the bot finishes processing.
- Close applications when the bot execution is successful or unsuccessful.
- Use the **Finally** block of the **Try/Catch/Finally** operation to ensure applications are closed regardless of success of the task processing.
- In the case that applications do not respond during testing, consider using the command

prompt to forcefully close (kill) the applications. For example, to forcefully close power point, the command-line operation would be:

```
Taskkill /IM powerpnt.exe /F
```

## Error handling

After completing the task, verify that the bot successfully handles any failure or exceptions.

- Each task or subtask must handle its own errors.
- An unhandled exception in a subtask can cause issues in a parent task.
- Use **Try/Catch/Finally** blocks at the root level of every bot.
- Use **Try/Catch** blocks inside of a loop if you want to try an operation multiple times before reporting a failure.

## Event or exception handling

Other than action errors that are captured by **Try/Catch**, you must perform code checks for other processes such as events or exceptions. If a certain process condition occurs, notify or log these conditions for additional analysis.

- Develop a configurable event handler TaskBot that minimizes the requirement for code changes if the actions change. For example, maintain an XML file that contains a definition of all the possible events or exceptions and any notification requirements when those events or exceptions occur.
- In the code, when such events or exceptions occur, write the information to an event log. You can also add memory usages and capture a screenshot.
- Run the event handler TaskBot to process the event or exception. For example, issue a notification using parameters such as email recipient, CC recipient, or subject from the XML file.
- If the notification requirements vary for each environment, or change over time, the configuration file can be updated without having to change the code.

## Running bots on other computers

When designing a bot, enable it so it runs on computers other than the computer on which a bot was created.

- Use variables for local file paths, network shares, or window titles so that your bot can successfully run from other machines.
- Consider using global values for environment markers or network shares that multiple bots need access to.

- Use wildcard characters for window titles where appropriate to enable bots to run regardless of specific environment or version of the target application. For example, instead of using

```
Salesforce - Professional Edition
- Internet Explorer
```

use the following:

```
Salesforce - * - Internet Explorer
```

### Using prompts, message boxes, and infinite loops

Prompts and message box actions stop the bots from running when waiting for a user input. Unless a user input is required, design the bots without using prompt statements.

- When using loops, ensure all loops have a definite end by clearly defining their number of iterations or specifying where break loop actions need to exist.
- If your bot is intended to run as an unattended bot, remove or disable any prompts or message box actions.
- If you are building bots for an attended automation scenario, message boxes and prompts are often reasonable or required for bots to run as expected. Use message boxes to display different variables, such as, responses, outputs, or values.

### Storing sensitive data in the Credential Vault

The Control Room includes the Credential Vault that can be used to store sensitive information, such as user names, passwords, API keys, and tokens.

- When building a bot, create a locker in the Control Room using the Credential Vault to store credentials and retrieve them as required by referencing the credential and the attribute. This allows users to create bots that consume APIs or perform logins without the need for bot builders to directly hard-code the required credentials within a bot.
- Do not hard-code sensitive credentials into a bot, or a subtask, because hard-coded storage in a bot introduces a security risk.
- When Credential Vault values are required to be used in a bot, verify that all locker names and credentials are clearly defined in the bot documentation. If required, include details on how to obtain credentials, for example, an API key or a token.

## Testing independent tasks

When creating bots for reusability, design them in a way that they can be tested independently of other subtasks.

- Practice the test-driven development (TDD) approach: When adding a new bot, or a new feature in an application, write a test case for it.
- In a test case, define the specific function that validates that feature or functionality.
- For single-responsibility principle and reusability, create many smaller tasks that can be tested independently.

## Using comments and steps

Comments enable developers to provide descriptions within their bots so that other bot developers can better understand what each section, block of code, or subtask is designed for. Include clear comments to allow developers to understand the purpose of the function of a given code block.

- When bots are submitted to the Bot Store, commenting demonstrates how to customize the bot.
- Using comments makes code maintenance easier because section descriptions help identify where changes might be required to enable developers to work towards quicker issue resolution
- Comments on bots that are a *work in progress* can be helpful when creating placeholders for future work. Consider using a *TODO* command as a reminder to add logic to the bot, but update the comments when the work is completed.
- Automation 360 includes the Step action, which provides the capability to organize the code into logical groupings to improve readability and the flow.
- Create an outline of the major objectives of your bot by using empty, labeled step actions. When that is completed, go back to each step and complete the logic for the step.

## Creating logging files

Identifying problems without logs can be difficult when bots are running unattended on any number of Bot Runners. Software developers, support teams, and bot owners rely on logs to understand where their automations have issues and how to diagnose problems. Bots must log errors to get error details.

- Use error handling and screen captures to better understand when a bot or subtask encounters an error.
- Use the A2019 Bot Store template that contains basic error handling, logging, and snapshot

capabilities with the customizable root logging location for maintaining older log files.

#### *Bot Store bot template*

- If required, create additional logging files and include a full audit history of everything a bot or subtask has done. The additional log files can include audit, debug, and performance information about the bot, as well as the following:
  - Main bot start and end time.
  - Subtask start and end time.
  - The completion time of specific milestones defined within the bot.
  - Number of transactions received in an input file.
  - Number of successfully processed or failed transactions.

---

**See also:** *Best practices: Building reusable and secure Automation 360 bots and packages*

---

### **Related tasks**

#### [Using Loop action](#)

Use the Loop action to repeatedly run a sequence of actions for a specific number of times or until a condition is met.

### **Related reference**

#### [Your variables \(user-defined\)](#)

Users and some actions create user-defined variables to temporarily hold values. Use this kind of variable to input values into an action (window title, login credential, or file path) or to accept the output of an action (values read from a file or a Boolean return).

#### [Application package](#)

Use the **Open Program/File** action in the **Application** package to launch an application or a file. This action supports .exe, .bat, script files, or shortcut paths.

#### [Error handler package](#)

The **Error handler** package contains actions that enable you to easily handle exceptions that a bot encounters and transfers control to the other actions within that bot.

#### [Step package](#)

The **Step** package groups various actions together and runs them in a specific order. You can provide a relevant name for a step to identify the operation performed by the actions included in that step.

#### [Prompt package](#)

Use the **Prompt** package to accept an input value, a yes/no response, or to open a file or folder.

#### [Message box package](#)

Use the **Message box** action from the **Message box** package to insert a message box that shows a message when the task runs. For example, you can insert a **Message Box** action to follow a web form so that the action displays the message: `Web Form Filled and Complete`.

## Building reusable packages

Review the guidelines to understand how to build packages for reusability.

### Know your incoming data

When setting fields that your action package requires from the user, provide specifics in setting the attribute type to limit the kinds of data that your package receives.

- Limit the input to reduce the burden of checks that have to be done when the package is received.
- Javadoc includes 34 defined attribute types, so review those when you build your package to select the appropriate field types.
- Set your package so that it takes a stored value. For example, on behalf of the bot, your package is making API calls, verify that the *AttributeType* of the action input field for the API key or a token is set to *credential*. This way users are encouraged to use a value stored in the Credential Vault for sensitive input data that the package requires.

### Use labels appropriately

In the *CommandPkg* annotation, use different labels, *node\_labels*, and descriptions appropriately.

- Use these labels as short descriptions of your action and use only a few words to describe an action.
- Replicate the same naming style as it is presented in the default Action packages.
- Each action is a child element of a package, and the action label is displayed along with the package icon in the Actions pane. Use short names to describe each action.
- Document an expected input format for certain fields. Use the parameter description for the *@Pkg* annotation. This allows package developers to review the format, requirement, or data that must be used for a specific input field. For example:

```
@Pkg(label = "Start Date",  
      description="Date Format as MM/  
DD/YYYY")
```

### Unit test your components

During the package development, create unit tests to validate that each component and the action of the package is working as expected.

- Validate the behavior of the individual test unit, a single class, or a single action, to ensure that it is functioning as expected.
- Review and document any feature or functionality defects at early stages of the development process.

## Handling errors

Include the error handling in the bot logic to ensure that all errors are handled gracefully. If an error is not handled, it could prevent a bot runner from executing other tasks.

- Create meaningful error messages that can help bot consumers with error resolutions.
- As a package developer, keep in mind these recommendations:
  - Use **Try/Catch** block to accommodate for an error.
  - Use a multi-catch block to find specific errors, and use the **BotCommandException** to return customized error messages. For example:

```
//create array of 3 items
int[] myIntArray = new int[]{1,
    0, 7};
try {
    //print 4th item in array

    System.out.println(myIntArray[3]);
    //Perform operation on
    first and second items in
    array
    int result =
    myIntArray[0] / myIntArray[1];
} catch
(ArrayIndexOutOfBoundsException
e) {
    //Throw custom message for
    IndexOutOfBounds
    throw new
    BotCommandException("The
    array does have the number of
    expected items.");
} catch (ArithmeticException e)
{
    //Throw custom message on
    Arithmetic Exception
    throw new
    BotCommandException("Math
    Operation Error with " +
    Integer.toString(myIntArray[0])
    + " and " +
    Integer.toString(myIntArray[1]));
}
```

## Follow single-responsibility principle

A package is a collection of actions. Each action within a package must have a single responsibility

and that responsibility must be encapsulated by that action.

- Following the single-responsibility principle helps your package consumers to implement it easily, simplifies testing, and avoids unnecessary modifications.
- The actions that you offer allow package consumers to customize the way they use your package within their bots, and can help their bots be as efficient as possible.

### Provide examples

When submitting packages to the Bot Store include a demo bot that demonstrates the use of the package.

- Use the Automation 360 actions and allow package consumers to use these actions to expend their bot capabilities.
- Always provide sample bots with descriptions to help your package consumers with the knowledge they require to understand its proper use.

---

**See also:** [Best practices: Building reusable and secure Automation 360 bots and packages](#)

---

### Related reference

#### [Building reusable bots](#)

Review the guidelines to gain a better understanding of how to develop bots or subtasks for reusability, from designing and creating through reusing.

## Troubleshooting and debugging

Troubleshooting and debugging information.

### Troubleshoot bot run issue

**Issue:** I'm unable to deploy a bot because I get the following – Unexpected error setting up a new user session.

**Cause:**

Most often, this error is caused by invalid device credentials.

**Solution:**

Confirm the device is registered and connected.

1. Select **Devices > My devices** from the Automation Anywhere web interface.
2. Confirm that the Status column shows **Connected** for the relevant device.

Confirm that the device username and password are correct.

1. Select the profile icon on the Automation Anywhere web interface and select **Edit profile**.
2. Verify the device username.  
Depending on how the device is configured within the network, you might need to prepend it with the domain name. For example, domainname\firstname.lastname.
3. Verify the device password.

## Debugger features

The Automation Anywhere Debugger provides tools to help identify and fix issues during bot development.

To run a bot in **Debugger** mode, select the bot to run the debug function against and select **Edit TaskBot**. From the **Edit** TaskBot page, do the following:

1. Click the **Debugger** icon.
2. Click the **Start** icon.

---

**Important:** Use the **List** view to debug bots. The list view provides access to all of the **Debugger** features and visual indications of which action is running.

---

Debugger features:

- To debug your task one action at a time, insert a breakpoint next to each action. This makes the task pause at the breakpoint.
  - To insert a breakpoint, click the vertical ellipses and select **Enable breakpoint**.
  - To remove a breakpoint, click the vertical ellipses and select **Disable breakpoint**.

---

**Tip:** You can enable and disable breakpoints in the **Debugger** mode, or in the regular edit mode.

---

- To move one action at a time, click the **Step over** icon.
- To clear all breakpoints, click the **Clear all breakpoints** icon.
- To stop the current debugging session, click the **Stop** icon.
- To exit debugging, click the **Exit debugger** menu.

---

**Note:** You cannot edit actions in **Debugger** mode.

---

## Bot agent log files

Various types of information about the Bot agent are captured in different log files. You can analyze these log files when the Bot agent or a bot encounters an error and identify the root cause for that error.

### Overview

The Bot agent log files enable you to perform these actions:

- Determine whether a bot ran successfully
- Identify issues that resulted in a bot failure
- Determine if the device is properly connected with the Control Room

## Log file locations

The Bot agent log files are available at `C:\ProgramData\AutomationAnywhere\BotRunner\Logs` on your device. The following files are available at this location:

### Bot\_Launcher

Captures information about the execution of a bot such as the operations performed, events triggered, and errors encountered by the bot.

### Node\_Manager

Captures information about when a bot is run from the Control Room and communication details between a Bot Runner and the Control Room.

## Log file configuration

The configuration files `botlauncher-logging` and `nodemanager-logging` are available at `C:\Program Files\Automation Anywhere\Bot Agent\config`. The information captured for the Bot agent in the log files depends on the configuration set in these files. You can update the configuration files to change the level of information captured in these files by setting the value in the `ROOT level` tag in the files, for example, `ROOT level="INFO"`.

You can configure the following modes in the configuration files:

Mode	Level	Description
ALL	TRACE, DEBUG, INFO, WARN, ERROR, and FATAL	This is the most verbose logging level and logs all the modes.
TRACE	TRACE, DEBUG, INFO, WARN, ERROR, and FATAL	This mode captures information for all the modes.
DEBUG	DEBUG, INFO, WARN, ERROR, and FATAL	This mode captures information that you can use to debug a bot.  Information in this file is typically used by a Bot Creator.
INFO	INFO, WARN, ERROR, and FATAL	By default, this mode is set in the log files. This mode captures information used for monitoring the normal operations of a bot and auditing.  You can use the information collected in this mode to determine whether a business process was completed properly or not.

<b>Mode</b>	<b>Level</b>	<b>Description</b>
WARN	WARN, ERROR, and FATAL	This mode captures information about all the warnings that appear when a bot is executed.
ERROR	ERROR and FATAL	This mode captures information about all the errors encountered when a bot is executed.
FATAL	FATAL	This mode captures information about the exceptions encountered when a bot is executed.
OFF	None	This mode does not capture any information.

# Manage

---

This collection of topics will guide you in configuring the devices and users that access Automation Anywhere.

Learn more about these topics:

## Related tasks

### [Schedule a bot](#)

Schedule a bot to run at a specific time.

### [Set up locker and assign credentials](#)

Create a role, credentials, and locker to share related sensitive values with a group of users, so they can use those values to build or run bots.

### [Create and assign roles](#)

Administrators configure roles with permissions to access features and perform operations such as create, edit, or delete a bot in the Control Room.

### [Create a user](#)

Create a user and assign their specific license based role.

### [Set user device credentials](#)

To enable a device for running bots, set the local device credentials.

### [Edit profile](#)

Manage user profiles.

### [Installing additional licenses](#)

Upload new licenses to the Automation Anywhere Control Room to be distributed to users as required.

## Activity

Monitor, pause, stop, and resume ongoing automation activities and view all the Bot Runner (attended or unattended) trigger deployments in queue.

### In Progress Activity

Enables user to monitor a range of process activities. Apply search parameters to find a specific bot. Search parameters include:

#### Status

Choose the status to search, options include:

- Active
- Paused
- Unknown
- Paused for input
- Pending execution
- Queued

#### Current action

Type the action.

#### Current bot

Type the bot name.

<b>bot</b>	Type the bot name.
<b>Activity type</b>	Select the type, options include: <ul style="list-style-type: none"> <li>• Run bot</li> <li>• Import queue files</li> <li>• Run bot with queue</li> </ul>
<b>Queue</b>	Type search criteria.
<b>Device</b>	Type search criteria.
<b>Automation priority</b>	Select the automation that is prioritized as High, Medium, or Low.

## Action buttons

Use mouse to rollover action icons (vertical ellipsis) to identify specific functions. The following actions are enabled:

<b>Refresh</b>	Refresh the contents to view the updated status.
<b>Pause checked items</b>	Pause the process.
<b>Resume checked items</b>	Resume running the process.
<b>Stop checked items</b>	Stop the process.
<b>Move checked items to history</b>	Moves the selected activity to history.
<b>Export checked items to CSV</b>	Export the data to a CSV file based on: <ul style="list-style-type: none"> <li>• Filters</li> <li>• Selection</li> </ul>
<b>Customize columns</b>	Show or hide specific columns.

## Schedule

Schedule bots to run on unattended Bot Runners from the **Activity** > **Scheduled** tab in the Control Room.

### Overview

Edit, view, activate, deactivate, delete a schedule, export selected activity details to a CSV file, and search by activity name.

Perform the following actions on a column:

- Click a column to sort it in ascending or descending order.
- Use a drag-and-drop operation to move the column left or right.
- Move the mouse cursor to the end of the column and drag to re-size.

## Schedule Actions

Perform the following tasks on an individual Schedule by moving your mouse over the **Actions** icon.

### Schedule a bot

Schedule a bot to run at a specific time.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

You must have the following permissions:

- **View and manage ALL scheduled activity** permission to schedule bots.
- **Set automation priority to high** permission to set the schedule priority.

Manage the bot schedule.

---

**Note:** Automation will fail in the following cases:

- If any of the bot dependencies are missing.
- If you do not have folder privileges on the dependencies.
- If you do not have the scheduling permissions.

- 
1. Navigate to **Activity > Scheduled**.
  2. Click **Run bot**.
  3. Click **Schedule bot**.
  4. Enter the **Name**.
  5. Optional: Enter a description.
  6. Add the scheduling details for the bot.

---

**Note:** The value of the **Start date** is always later than or equal to the current date. If the start date is the current date, the scheduled time cannot be less than the current time.

Option	Definition
<b>Run once</b>	<p>To run the bot at a specified time, enter the:</p> <p><b>Start date</b>                      Default value is the current day.</p> <p><b>Start time</b>                        Default value is roundup to the next half-hour.</p> <p><b>Time zone</b>                        Default <b>Time zone</b> is <b>PDT (UTC-7:00) Los Angeles, America</b>.</p>

Option	Definition
<b>Run repeatedly</b>	<p>To schedule a bot to run at specific time on a given day, enter the:</p> <p><b>Start date</b> Default value is the current day.</p> <p><b>End date</b> The default value field is blank.</p> <p><b>Start time</b> Default value is roundup to the next half-hour.</p> <p><b>Time zone</b> Default <b>Time zone</b> is <b>PDT (UTC-7:00) Los Angeles, America.</b></p>

7. Select the to schedule.  
Available are displayed along with any **Input values** and dependencies.
8. Select the user from the **Available bot runners** list.  
To enable a device, it must be connected to the .

---

**Note:** If a device does not appear in the list, ensure that an active session is running on the device.

---

9. Click the right arrow (→) to add your selection.
10. Select **Device pools**.  
Select the pool from the list of available device pools.
11. Optional: Click the up or down arrow to set the selected device pools in preferred order.  
When a is deployed, the selects the first available device based on the order in which you organized the device pools. If none of the devices are available at the time of deployment, the is queued.
12. Select the **Automation priority** from the **General** tab.
13. Click **Schedule bot**.

The **Schedule bot** option remains disabled until all the required items, such as bots, schedule details, and devices, are selected.

#### Related concepts

[Bot permissions for a role](#)

Assign bot permissions when creating a role with the **View my bots** feature permission.

#### Related tasks

[Edit a scheduled activity](#)

Make changes to a schedule so that the automation is not skipped.

[Delete a scheduled activity](#)

Delete a scheduled activity.

## Edit a scheduled activity

Make changes to a schedule so that the automation is not skipped.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Edit the scheduled activity in order to:

- Change the schedule type, date, or time.

- Add or remove Bot Runners from the schedule.
- Change the retry settings.

**Note:** The system redeploys the bots and dependencies only if there are updates to the bots or its dependent files.

1. Hover over the **Actions** icon for the scheduled in the Activity table.
2. Click **Edit**.
3. Make changes to the schedule details, bots, and devices, as required.

Option	Definition
<b>Run once</b>	<p>To run the bot at a specified time, enter the:</p> <p><b>Start date</b>                      Default value is the current day.</p> <p><b>Start time</b>                        Default value is roundup to the next half-hour.</p> <p><b>Time zone</b>                        Default <b>Time zone</b> is <b>PDT (UTC-7:00) Los Angeles, America.</b></p>
<b>Run repeatedly</b>	<p>To schedule a bot to run at specific time on a given day, enter the:</p> <p><b>Start date</b>                        Default value is the current day.</p> <p><b>End date</b>                          The default value field is blank.</p> <p><b>Start time</b>                        Default value is roundup to the next half-hour.</p> <p><b>Time zone</b>                        Default <b>Time zone</b> is <b>PDT (UTC-7:00) Los Angeles, America.</b></p>

4. Select **Device pools**.  
Select the pool from the list of available device pools.
5. Optional: Click the up or down arrow to set the selected device pools in preferred order.
6. Optional: Change the **Automation priority** from the **General** tab.
7. Click **Schedule bot**.

The **Schedule bot** option remains disabled until all the required items, such as bots, schedule details, and devices, are selected.

#### **Related tasks**

[Schedule a bot](#)

Schedule a bot to run at a specific time.

[Delete a scheduled activity](#)

Delete a scheduled activity.

## Delete a scheduled activity

Delete a scheduled activity.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

To delete a scheduled activity:

1. Hover over the **Actions** icon for the scheduled in the Activity table.
2. Click **Delete**.  
Confirm or cancel as required.
3. Click **Yes, delete**.

### Related tasks

[Schedule a bot](#)

Schedule a bot to run at a specific time.

[Edit a scheduled activity](#)

Make changes to a schedule so that the automation is not skipped.

## Historical activity

You can search, edit, and deploy previously created bots.

### Search parameters

Apply search parameters to find a specific bot. These parameters include:

<b>Status</b>	Choose an activity status: <ul style="list-style-type: none"> <li>• Completed</li> <li>• Failed</li> <li>• Stopped</li> <li>• Timed out</li> <li>• Unknown</li> <li>• Deploy failed</li> <li>• Pending execution</li> </ul>
<b>Item name</b>	Enter the name of the item listed.
<b>Device name</b>	Enter the device name.
<b>Bot name</b>	Enter the name of the bot.
<b>User</b>	Enter the user name.
<b>Automation priority</b>	Select the automation that is prioritized as High, Medium, or Low.

## Actions buttons

You can perform the following actions:

### **Export checked items to CSV**

Export the data to a CSV file based on:

- Filters
- Selection

### **Refresh**

Refresh the contents to view the updated status.

### **Customize columns**

Show or hide specific columns.

## Completed historical activity

View a list of all completed activities and corresponding information.

### Completed activities

All activities, successfully completed or not, are listed in the historical activity page. From this page, run an activity again and perform other tasks such as export the data in the table in CSV format, customize columns, or refresh the list in the table. Apply search parameters in the search bar.

---

**Note:** Specify search parameters for the same column using **OR** operator. Specify search parameters for different columns, the system searches using **AND** operator.

---

Perform the following actions on a column:

- Click a column to sort it in ascending or descending order.
- Use a drag-and-drop operation to move the column left or right.
- Move the mouse cursor to the end of the column and drag to re-size.

## Information displayed

The **Activity** table displays information such as the following:

<b>Status</b>	The status of the activity, including unknown, completed, failed, stopped, or time out.
<b>Item name</b>	The name of the item.
<b>Device name</b>	The name of the Bot Runner machine.
<b>Bot name</b>	The name of the bot.
<b>User</b>	The name of the user in whose account that particular activity or automation was running on the device.
<b>Started on</b>	The date and time when the activity was started.
<b>Ended on</b>	The date and time when the activity was completed.
<b>Last Modified</b>	The date and time when the activity was changed.

**Modified By** The name of the user who recently changed the activity.

## Actions

Click any individual item to perform the following actions:

**View** View details of the completed activity.

**Run bot** Run the selected bot. Click **Run** to open the **Run bot now** page with all the values of the bot populated.

---

**Tip:** Move your mouse over and click the **Run** icon to run the activity again.

---

Actions must be done only at a table level, and not on individual items.

## Audit Log

View logs and details to record user activities.

Audit Log displays a read-only table of records of actions performed by users. These log records are searchable and exportable. Audit logs include both **Successful** and **Unsuccessful** actions attempted.

## Actions

The following Audit log actions are enabled:

---

**Note:** Use your cursor to roll over the action button icons to identify specific functions.

---

**Time filter** Users select from preset time filters or configure a custom time filter for log entries to view. The default time filter setting is **Last 24 hours**.

**Search** Search the records. Select additional search filter criteria from the drop-down menu.

---

**Tip:** To search the exact phrase, enclose the search phrase within double quotes (for example, "Juan-Finance-564").

---

**Export checked items to CSV** Export the data to a CSV file based on filters and or selections.

**Refresh** Refresh and view the updated status.

**Customize columns** Show or hide specific columns.

**View** To view details of a table entry, mouse over the entry to expand and click **Audit details**.

## Audit log table

View the following audit details in the table. Click a column to sort it in ascending and descending order.

Table item	Description
Status	Shows action status.
Time	Shows the date and time of the action performed.
Event Type	Shows the type of action performed.
Item Name	Shows the entity on which action was performed.
Event Started By	Shows the user that performed the action.
Source Device	Shows the device or machine name or IP address that was used to perform the action.
Source	Shows the component: Control Room, Enterprise client or API, from where the action originated or was performed.
Request ID	Shows the unique identity number assigned to a specific set of user actions.

## Understanding audit logs

The entry shows the status of each stage of the bot life cycle.

Audit log entry	Success	Failure
Create automation	Bot was sent to the control room and was successfully compiled.	Check if the Control Room is up and running.

Audit log entry	Success	Failure
Bot Sent To Device	Control Room deployed the bot successfully on the specified device.	Possible reasons for failure entry include: <ul style="list-style-type: none"> <li>• Check if you have configured the Node manager on the corresponding device correctly.</li> <li>• Check for the app Automation Anywhere Bot Manager in <b>Add Remove Programs</b> or in <b>Control Panel &gt; Uninstall a program</b>. Try to reinstall by uninstalling and downloading the app again.</li> <li>• Try to reinstall by uninstalling and downloading the app again from Device Manager.</li> <li>• Ensure the device auto log in details are set correctly.</li> </ul>
Run bot Deployed	The bot has started on the specified device.	Possible reasons for failure entry include: <ul style="list-style-type: none"> <li>• Check if you have configured the Node manager on the corresponding device correctly.</li> <li>• Check for app Automation Anywhere Bot Manager in <b>Add Remove Programs</b> or in <b>Control Panel &gt; Uninstall a program</b>.</li> <li>• Try to reinstall by uninstalling and downloading the app again from Device Manager.</li> <li>• Ensure device auto log in details are set correctly.</li> </ul>

Audit log entry	Success	Failure
Run bot finished	Bot execution completed successfully.	Possible reasons for failure entry include: <ul style="list-style-type: none"> <li>• Check for the bot execution progression in Activity In progress.</li> <li>• Check the code at the line where activity log has been paused for errors.</li> <li>• If it has paused at a message box, minimize all windows and check if the message box is in the background.</li> </ul>
Bot Runner Session Continued	Control Room deploys the TaskBots in a sequence for the same RDP session.	Possible reasons for failure entry include:
Bot Runner Session Released	When a task successfully completes the execution.	Possible reasons for failure entry include:
Download file	Downloading to the Control Room.	Possible reasons for failure entry include:
Upload file	Uploading a file to the Control Room.	Possible reasons for failure entry include:
Bot Runner Session	Control Room gets the RDP session of Bot Runner machine.	Possible reasons for failure entry include:

## About event triggers

An event trigger is a predefined action that runs an associated bot. All the bots with event triggers are listed under the **Event triggers** tab.

### Available role permissions for event triggers

A Control Room administrator must provide the required permissions to ensure the associated users can access event triggers. The following table lists the available permissions:

Permission	Description
<b>View event triggers</b>	Select this permission if the users can only view the event triggers, but not run or delete them.

Permission	Description
<b>Manage event triggers</b>	<p>The <b>Manage event triggers</b> permission is only available if the <b>View event triggers</b> is enabled. Select this permission if the users can:</p> <ul style="list-style-type: none"> <li>• Add event trigger</li> <li>• Run a bot with event trigger</li> <li>• Delete event trigger</li> <li>• Associate an event trigger with a Bot Runner (attended or unattended) user or a role that is associated with one or more Bot Runner (attended or unattended) users.</li> </ul>

## Supported actions

In Automation 360, click **Manage > Event triggers** to view the table that lists all the available bots with event triggers. The following actions are available for this table.

- Enter a keyword from the `BOT_PATH` in the **Search** field to find an event trigger.

For example, if the bot path of an event trigger is `Bots\file--created--event--Salesinfo`, enter `Sales` in the **Search** field to find this event trigger.

- Use the **Run with event triggers** option to add event triggers.

### *Adding event triggers*

- User can also delete any associated (active or inactive) event triggers.
- View the trigger status, bot path, user name, role, and modification details.

Consider a scenario where triggers are associated with a Bot Runner user who logs off or signs out of a device. When this user logs in to that device again, all the associated triggers are displayed as **Active** if another user is reviewing the **Event triggers** or **Trigger status associations** page. However, the Bot Runner user must log in to Control Room again to activate the associated triggers.

## Related concepts

### [Adding a trigger to run a bot](#)

Add triggers that can automatically run the selected bot whenever a specific event occurs. For example, clicking a specific button or using a combination of keystrokes.

## Adding event triggers

Any bot with triggers can be associated with users or role to enable event trigger. Control Room user (or role) with **Manage event triggers** permission can add event triggers.

All the bots a user creates are displayed in the **Private** tab. When the user checks in a bot to a public folder, it is displayed in the **Public** tab.

A private event trigger is created when a user with the **Manage event triggers** permission adds a trigger to a bot but does not check in this bot to a public folder. Private event triggers are listed under the **Manage > Event triggers** page. However, if the user checks in the associated bot to a public folder, it is no longer displayed under the **Event triggers** page.

1. Navigate to **Bots > My bots**.
2. Click **Run bot**.
3. Click **Run with event triggers**.
4. Select the bot.

5. Click the right arrow (→) to add your selection.
6. Click **Next**.
7. Select one of the following to link the bot:

Option	Description
<b>Roles</b>	Select the custom role you have created.
<b>Users</b>	Select the Bot Runner (attended or unattended) user who is associated with this custom role.

8. Click the right arrow (→) to add your selection.
9. Click **Next**.
10. Click **Run with event triggers**.

The selected bot is added to the **Event triggers** page under **Activity**.

#### Related concepts

##### [Working with bots](#)

Depending on the license and permission assigned to you, you can perform various bot operations and access the private and public workspaces in the Control Room.

## Linking event triggers to a Bot Runner

A Control Room administrator or users with **Manage event triggers** permission can add event triggers by associating users or roles with a bot. This enables Bot Runner users to trigger the bot when they perform a specified event.

When a user with a Bot Creator license creates a bot and checks it in a repository, the bot is available in the **Public** workspace. An Control Room administrator or user with **Manage event triggers** permission and access to that **Public** workspace can then link an event trigger.

A Bot Runner (attended or unattended) user must log into the Control Room to start the event trigger, and can choose to log out after that event trigger is activated.

Optionally, administrator can also enable the auto-login feature in the Control Room for unattended Bot Runner users.

See [Configure auto-login settings](#).

---

**Note:** If you include users with unattended Bot Runner licenses, they must provide the login credentials of the default device.

---

1. Navigate to **Bots > My bots**.
2. Click **Run bot**.
3. Click **Run with event triggers**.
4. Select the bot.
5. Click the right arrow (→) to add your selection.
6. Click **Next**.
7. Select one of the following to link the bot:

Option	Description
<b>Roles</b>	Select the custom role you have created.
<b>Users</b>	Select the Bot Runner (attended or unattended) user who is associated with this custom role.

8. Click **Add event trigger**.

When the Bot Runner user logs in to Control Room and performs the trigger event, the bot is deployed.

The event trigger will continue to work until one of the following changes occur:

- Associated bot is deleted from the public workspace.
- The linked Bot Runner user account is deleted.
- The default device is logged off.

## Devices

The device is a machine through which a user connects to the Control Room to create or run bots. Manage devices that are registered to the Control Room through the **Devices** page located in the **Manage** tab.

### Tasks performed from the Devices page

As a Control Room user with Bot Runner, Bot Creator, and Device pools privileges, use the **Devices** page to do the following:

- View a list of devices registered and connected to the current instance of the Control Room.
- Create and view a list of device pools available from the current instance of the Control Room.
- Run bots immediately on selected Bot Runners.

If the device is already registered by another user other than the Bot Creator and the Bot Creator does not have the `Register device` permission or the associated device assigned to it, when you run a bot from the bot editor window, the deployment fails with an `insufficient permission` error message.

- Schedule bots to run on selected Bot Runners.
- Run bots on selected device pools.

---

#### Notes:

- Only an admin user has access to view all the devices in the Control Room. A non-admin user does not have access to view Bot Creators.
  - Only one Bot Creator can be logged in to a device to run bots at any one time. For a new user as a Bot Creator on the same device, the first Bot Creator has to be removed.
- 

## Devices

The **Devices** page lists all configured devices and the current state for each device listed. Devices are identified by IP and hostname. A device can be in one of the following states:

<b>Connected</b>	Device is logged in to the Control Room.
<b>Disconnected</b>	Device is not logged in to the Control Room.
<b>Offline</b>	Device has been unregistered or disabled by the Control Room administrator.

The following actions are enabled:

<b>Connect local device</b>	The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent
-----------------------------	--

**Run bot now with checked items****Export checked items to CSV**

and add the local device to the list of enabled host devices.

Runs the bot on selected device.

Export the data to a CSV file based on:

- Filters
- Selection

**Refresh**

Refresh the contents to view the updated status.

**Customize columns**

Show or hide specific columns.

**View and edit device**

With the **View and manage ALL device(s)** permission, you can view and edit the following device settings:

- Name
- Status
- Bot agent version
- Device pool name
- Nickname (optional)
- Description
- Device type (single user or multiple users)

In case of a multi-user device, you can edit the **Concurrent sessions supported** field.

- Add or edit device permissions
- Screen resolution

You can set the screen resolution by either selecting a value from the predefined resolution drop-down list or by selecting custom and entering the values.

- You can edit only the nickname, description, device type, and screen resolution fields.
- Ensure that you have selected the **Allow devices to override resolution settings** option in the Control Room settings for the device level resolution to take effect.

- Lifespan

Device lifespan can be **Persistent** or **Temporary**. Temporary devices are created to support non-persistent virtual desktop infrastructure (VDI) and are automatically deleted after a specified time when the device is disconnected from the Control Room. You can specify the time to automatically delete temporary devices in the Control Room devices settings.

Persistent devices are created to support persistent virtual desktop infrastructure (VDI) and are not deleted after the device is disconnected from the Control Room.

- Auto-login settings

You can customize the auto-login settings for each device. Choose between the settings configured in the Control Room or at the selected device level to either create new user sessions or use existing user sessions after a bot finishes running.

- Installation type

This setting is based on whether the Bot agent is installed at user level or system level on the user device.

- Deployment type

This setting is based on the user type and installation type. For single users installed at the system level, the default deployment type is regular. For multi-users installed at system level, the default deployment is RDP.

## Device pools

Device pools provide a logical grouping of similar Bot Runners to run bots with the work items from a queue. For example, group devices of a particular department or unit and create a device pool for it.

### Related tasks

#### [Install Bot agent and register device](#)

The Bot agent is a lightweight application that enables you to run bots on your device by connecting the device to the Control Room. To run bots on a local machine, install the Bot agent and add the local device to the list of enabled host devices.

#### [Set user device credentials](#)

To enable a device for running bots, set the local device credentials.

#### [Configure auto-login settings](#)

Configure auto-login settings in the Control Room to either create user sessions or reuse existing user sessions to reduce the bot startup time.

## About multi-user devices

A multi-user device is any Windows terminal server device (Windows 2019, Windows 2016, Windows 2012, Windows 10 Enterprise on Azure) which enables multiple users to concurrently log in to a single device.

The multi-user device server enables multiple users to access the same operating system and share the hardware, performing the tasks for each user concurrently. In multi-user devices, bots are deployed using RDP.

### Benefits of a multi-user device

A multi-user device ensure that each machine in an organization is fully used, reducing the hardware and software cost by enabling different users to access the same device. Bot Creator users and Bot Runner (attended or unattended) users can be configured on a multi-user device. The multi-user device also provides security and authentication for every user. Each user is assigned unique login credentials for the device and can access only the assigned applications and device settings.

---

**Note:** In a multi-user device, if two user sessions with the same device credentials try to deploy a bot, the deployment will fail for one of the user sessions. An appropriate failure message is recorded in the audit log.

---

## Multi-user device in a device pool

A multi-user device can be part of a device pool and the device can be set as the default device for Bot Creator users and Bot Runner (attended and unattended ) users.

### Set as default device

As a licensed user, when you log in to a non-default device, you can set that device as your default device. You must have the **View and manage ALL device(s)** permission if you want to set another device that is not registered by you as your default device: To set it as the default device, follow these steps:

1. Click the device icon on the top-right of your screen.
2. Select the **Make default device** option from the menu.

If you do not have the necessary permission, a message prompt appears, stating that you will lose access to your current default device.

## Configure RDP-based deployment for multi-user devices

RDP-based deployment is used for multi-user devices. When a bot is deployed for an unattended Bot Runner from the Control Room, the Control Room handles the unattended Bot Runner session through RDP and executes the bot.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Ensure the following requirements are completed:

- Active Directory Domain Services are set up.
- Remote Desktop Services (RDS) are set up.
- Active Directory users are created.
- Users are provided access to RDS.

When registering your device, you can register it as a multi-user device.

1. Navigate to **Devices > My devices**.
2. Hover over the **Actions** icon for the device.
3. Click **Edit**.
4. Change the **Device type** to **Multiple users**.
5. Enter a value for the **Concurrent sessions supported** field.

The maximum number of allowed concurrent sessions depends on your device license type and the hardware configuration. For example, consider that concurrent sessions is set to 10 and each bot requires 4 GB RAM for execution. If your system RAM is lower than this value, the bot execution might fail.

Also, if the maximum number of sessions allowed in your device is 10 and the multi-user device is set as the default device for 3 Bot Creator users and 2 attended Bot Runner users, then the value for the concurrent sessions supported will be 5. Therefore, at a time, only 5 bots can be deployed

concurrently by the unattended Bot Runner users. So ensure that your hardware and device license type support the number of sessions you set.

**6.** Set the RDP screen resolution.

This ensures your automation runs seamlessly during RDP-based deployment, even if the resolution of the screen varies between the Bot Runner and Control Room.

You can set it in the following ways:

- At the Control Room level: [Change screen resolution for Bot Runner session.](#)
- At the device level: [Devices.](#)

**7.** Edit the **RDP settings for multiple user devices** field.

**8.** Enter the **Port**.

**9.** Enter the **RDP session timeout** value.

---

**Note:** The default port is 3389 and session timeout value is 60.

---

**10.** Click **Save changes**.

**1.** Create users in the Control Room.

These users can be unattended Bot Runners, Attended Bot Runners, or Bot Creators. You can select the multi-user option when you register the device for the first time..

[Create a user](#)

**2.** Associate the correct device and session login credentials based on the Active Directory users that you create before configuring the multi-user device settings.

You can register an Active Directory user once as an admin user and the sessions are created when you deploy bots. You do not have to create an RDP session on the Bot Runners server and register the device under an Active Directory user name and user credentials.

**3.** Deploy the bots on parallel sessions.

---

**Note:** If the multi-user device per sessions count provided is less than the actual bot deployment, then the additional bot deployments are queued until the current deployments are in progress.

---

## Convert an existing device to a multi-user device

If you have a server OS, multi-user OS, or hosted VMs such as AWS, Microsoft Azure, or VMware as the Bot Runner machine, you can convert your existing device to a multi-user device.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Converting a device enables you to share the same device between Bot Runner and Bot Creator users because they can coexist in different sessions simultaneously. Also, multiple parallel executions of a bot can be performed on the same machine.

If you encounter Auto Login issues because multiple users are sharing the device or because it is a remote device, convert your device to a multi-user device.

If you have a single-user device and want to use RDP-based deployment, then set the **device type** as **Multiple users** and **Concurrent sessions supported** to **1**.

- 1.** Navigate to **Devices > My devices**.
- 2.** Hover over the **Actions** icon for the device.
- 3.** Click **Edit**.

4. Change the **Device type** to **Multiple users**.
5. Enter a value for the **Concurrent sessions supported** field.

The maximum number of allowed concurrent sessions depends on your device license type and the hardware configuration. For example, consider that concurrent sessions is set to 10 and each bot requires 4 GB RAM for execution. If your system RAM is lower than this value, the bot execution might fail.

Also, if the maximum number of sessions allowed in your device is 10 and the multi-user device is set as the default device for 3 Bot Creator users and 2 attended Bot Runner users, then the value for the concurrent sessions supported will be 5. Therefore, at a time, only 5 bots can be deployed concurrently by the unattended Bot Runner users. So ensure that your hardware and device license type support the number of sessions you set.
6. Click **Save changes**.

## About device pools

Device pools are a logical grouping of devices or similar Bot Runner machines on which you can run your workload management automations or scheduled automations. For example, you can group devices of a specific department or unit and create a device pool for it.

### Overview

Device pools enable you to restrict bot deployments to a specific set of devices that are available from your Control Room instance and to take advantage of any available device in the pool. Any device in the device pool can run the bot.

A device pool is a dedicated set of Bot Runners to process Work Items in queues. Multiple Bot Runners enable you to scale high-volume tasks as the workload is shared across the device pool, thereby providing load balancing. Device pools can contain different types of devices, single user or multi-user devices.

You can share the device pool between multiple automations such as WLM, **Run bot**, and **Schedule bot**, thus improving the device utilization.

### How a device pool works

When you deploy a bot to a device pool, the bot is automatically sent to the first available device in that device pool. As the other bots are deployed, they can run concurrently on the other devices in the device pool. By dynamically allocating devices when bots are deployed, bot deployments are executed quickly and efficiently.

You can assign priorities to devices in a device pool so that a specific device is used before other devices in the device pool. The priority assigned to a device in one device pool is not related to that device's priority in another device pool.

### High availability (HA) in device pools

Device pools provide built-in *High Availability* for the Bot Runner machines. You are not tied to a single Bot Runner machine, so if your Bot Runner machine is unavailable for any reason, your automation is not affected. The scheduled automation will automatically run on the next available Bot Runner machine, thereby providing high availability.

## Managing device pools

As a device pool administrator, you can create, edit, and view all device pools that can be used for scheduling automations and workload management.

As a device pool owner or consumer, you can view only those device pools of which you are the owner or consumer. Only users with the AAE\_Queue Admin role can perform device management tasks.

---

**Note:** You have to create device pools to view those in the list.

---

To easily access your device pool, you can search by a device pool name.

- Click a column to sort it in ascending and descending order. You can sort up to three columns by holding the Shift key when you click two more columns. This enables you to sort two additional columns. The sorting is done on the entire table and not just the data that is currently visible to you. The last sorting is stored in memory applied by a user per session.
- Use a drag-and-drop operation to move the column left or right.
- Move your mouse cursor at the end of the column and drag to resize.

## Create device pools

Create a device pool with a unique name and add Unattended Bot Runners to the device pool.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

- You can add only those Unattended Bot Runners that are not part of any other pool and are not associated with any role.

---

**Restriction:** Unattended Bot Runners that are a part of other device pools are disabled for selection.

---

- If the device associated with the Unattended Bot Runner is added to the device pool, you can only use the **Run bot with queue** option to run bots on that device. You cannot create a device pool comprising of Attended Bot Runners.
- You can add Control Room user roles as consumers. Only users with these roles can use the pool for any automation.
- You can select only those devices with the Bot Runner installed at the system level.

By default, the creator of the pool is the device pool owner.

---

**Restriction:** You cannot remove the device pool creator.

---

To create a device pool, do the following:

1. Navigate to **Devices > My device pools**.
2. Click **Create device pool**.
3. Enter the **Name**.
4. Optional: Enter a description.
5. Select the Unattended .
6. Click the right arrow (→) to add your selection.
7. Click **Next**.
8. Select the **Device Pool Owners**.

9. Select user(s) from the **Available users** list.

---

**Tip:** Search the list of users based on their **Username, First name, or Last name.**

---

10. Click the right arrow (→) to add your selection.
11. Click **Next**.
12. Optional: Select the **Device Pool Consumers**.  
Complete this step to enable device pool consumers to view the device pool when they run the automation for the bot with a queue by following the next set of steps.
13. Optional: Select a Role from the list of **Available roles**.
14. Click the right arrow (→) to add your selection.
15. Click **Create device pool**.

The device pools for which you have consumer privileges are listed in the **My Device Pools** page.

[View device pool details](#)

### **Related concepts**

[Run bot with queue](#)

Collectively process all work items of a queue across all the Bot Runners present in one or more device pools.

## View device pool details

As a Control Room user with device pool management privileges or as a device pool owner, you can view device pool details to ensure the information provided is correct and if required customize as per your automation requirement.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Use the **Device pool details** page to view automations that are scheduled to run with or without workload. The following information is displayed as part of device pool data:

### **Automations**

Shows the automations that are using the device pool and the order that is chosen to run those. This is shown as the default view. To find an automation quickly, use the search option using Status, Automation name, Queue, or Activity type.

You can perform the following actions on a table column:

- Click a column to sort it in ascending and descending order. You can sort up to three columns by holding the Shift key when you click two more columns. This enables you to sort two additional columns. The sorting is done on the entire table and not just the data that is currently visible to you. The last sorting is stored in memory applied by a user per session.
- Use a drag-and-drop operation to move the column left or right.
- Move your mouse cursor at the end of the column and drag to resize.

<b>Devices</b>	Shows list of unattended Bot Runner devices that are part of the device pool.
<b>Owners</b>	Shows list of device pool owners that are granted permission to view, edit, and delete the device pool. <a href="#">Create device pools</a>
<b>Consumers</b>	Shows the list of device pool consumers who are granted permission to view the device pool as an option to running automations. <a href="#">Create device pools</a>
<b>General Details</b>	Shows the last modified date and time, name of the user who modified device pool details, and the Object Type which is the component on which modification was done.

The **Scheduled Automations** tab is selected by default. Automations that are created using **Run bot now** or **Schedule bot** (upcoming schedules) on that device pool are listed.

The second tab, **Run with Queue Automations** lists the automations that are scheduled to run for **Workload** using the option **Run bot with queue**.

To view device pool details:

1. Navigate to **Devices > My device pools**.
2. Hover over the **Actions** icon for the device pool and select **View**.  
Select each tab to view the related details.

[Edit device pools](#), or [Run bot with queue](#).

#### **Related tasks**

##### [Create device pools](#)

Create a device pool with a unique name and add Unattended Bot Runners to the device pool.

##### [Delete device pools](#)

Delete a device pool comprising of unattended Bot Runners after your entity's automation goals are achieved and the device pools are no longer required.

## Edit device pools

As a Control Room user with device pool management privileges or as a device pool owner, you can edit device pool details to customize your automation requirements.

When you open the device pool in edit mode, you have to first define the priority or the order in which the automations will run in the **Automations** tab. The priority options are visible only when you edit a device pool and are not available when you create a device pool. You can also update the Bot Runner, Owner, and Consumer details.

1. Go to **Devices > My Device Pools**.

2. Locate the device pool you want to edit, mouse over the actions menu (vertical ellipsis), and click **Edit**.

You can also edit device pool details when in view mode.

*View device pool*

The **Device pool details** page appears with the **Scheduled Automations** tab selected by default.

The first tab, **Scheduled Automations** lists the automations that are created using **Run bot now** or **Schedule bot** (upcoming schedules) on that device pool.

*Run a bot*

*Schedule a bot*

The second tab, **Run with Queue Automations** lists the automations that are scheduled to run for Workload using the option **Run bot with queue**.

3. Set the Queue Execution mode to edit workload automations.

Select the **Run with queue automations** tab, then select either **Round robin** or **Priority as shown in table** to define the order in which your automations run in the queues:

- **Round robin:** Run your automations at equal time intervals in the **Time slice** field.

Set a **Time slice** in seconds, minutes, or hours. Calculate or estimate the time for each automation and then provide this number.

- The default time slice is **5 minutes**.
- The time slice cannot be set to zero.

Automations are executed for only 5 minutes first, then the system checks for other automations in queue for execution. If there are other automations in the queue, that automation is paused and the next automation is executed. This method continues until all automations in the queue are executed.

- **Priority as shown in table:** Run your automations based on a priority defined in the priority table. This method enables you to run automations in the order of priority.

Set the individual priorities for each of the queues. Priority 1 is the highest priority and that queue is processed first and completely by the device pool. Then the device pool moves onto the

processing queue with Priority 2. When the queue with Priority 2 is processed completely, the device pool proceeds to processing queue with Priority 3, and so on.

Automations are processed until all automations are consumed from the specified automation queue.

This option appears only on the **Run with queue automations** tab. It is not available when you use **Schedule Automations**.

The following details are listed the priority table:

Table item	Description
Priority	Shows the priority number allotted to that queue. <ul style="list-style-type: none"> <li>You can edit the <b>Priority</b> column. You can set or reset the priority of implementing the automations. Ensure that you provide a unique priority value to two different work items because same values are not be allowed.</li> <li>You can also view the priority list in ascending or descending order by clicking the ordering arrows in the <b>Priority</b> header.</li> </ul>
Status	Shows the automation status: Active or Inactive.
Automation Name	Shows the automation that is selected to run on the device pool.
Started On	Shows the run date and time of the automation.
bot	Shows the bot name that will run using this device pool.
Queue	Shows the queue name that will be used to run the automation using this device pool.
Activity Type	Shows the activity type used to run the automation using this device pool - Run bot with queue.

You can perform the following actions on a table column:

- Click a column to sort it in ascending and descending order. You can sort up to three columns by holding the Shift key when you click two more columns. This enables you to sort two additional columns. The sorting is done on the entire table and not just the data that is currently visible to you. The last sorting is stored in memory applied by a user per session.
- Use a drag-and-drop operation to move the column left or right.
- Move your mouse cursor at the end of the column and drag to resize.

#### 4. Update the list of unattended Bot Runner devices that will be included in the device pool.

5. Update the list of device pool owners who are granted permission to view, edit, and delete the device pool.
6. Update the list of device pool consumers who are granted permission to view the device pool.
7. Click **Save changes**.

### Related tasks

#### [Create device pools](#)

Create a device pool with a unique name and add Unattended Bot Runners to the device pool.

#### [Delete device pools](#)

Delete a device pool comprising of unattended Bot Runners after your entity's automation goals are achieved and the device pools are no longer required.

#### [View device pool details](#)

As a Control Room user with device pool management privileges or as a device pool owner, you can view device pool details to ensure the information provided is correct and if required customize as per your automation requirement.

## Delete device pools

Delete a device pool comprising of unattended Bot Runners after your entity's automation goals are achieved and the device pools are no longer required.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

You can choose to delete your device pools in either of two ways:

- Delete one device pool
- Delete multiple or all device pools

If the device pool is being used for workload automation, you will not be allowed to delete it.

1. Navigate to **Devices > My device pools**.
2. Select the device pool(s) to delete.  
Select the device pools to delete or select all device pools by selecting the **Select All** check box in the header.
3. Hover over the **Actions** icon for the device pool.
4. Click **Delete**.  
Confirm or cancel as required.

### Related tasks

#### [View device pool details](#)

As a Control Room user with device pool management privileges or as a device pool owner, you can view device pool details to ensure the information provided is correct and if required customize as per your automation requirement.

#### [Create device pools](#)

Create a device pool with a unique name and add Unattended Bot Runners to the device pool.

## Customize device settings

Customize the settings for user devices at the device level such as device lifespan, auto-login, screen resolution, deployment, and other advanced options.

These configurations are available for editing only if the settings are enabled by the Control Room administrator.

**1. Navigate to **My Devices** > **Edit devices**.**

**2. Select the setting tab for configuration at the device level:**

- a) Update the **Nickname** and **Description** parameters, and select either **Persistent** or **Temporary** in the **General Settings**.

Device lifespan can be **Persistent** or **Temporary**. Temporary devices are created to support non-persistent virtual desktop infrastructure (VDI) and are automatically deleted after a specified time when the device is disconnected from the Control Room. You can specify the time to automatically delete temporary devices in the Control Room devices settings.

Persistent devices are created to support persistent virtual desktop infrastructure (VDI) and are not deleted after the device is disconnected from the Control Room.

- b) To update the settings for **Auto Login** to run bots on user sessions at the device level, select **Use custom settings**.

Either create new user sessions or use existing user sessions after a bot finishes running.

You can customize the auto login settings at the device level only if the allow a user to change these settings individually for each device in devices page option is enabled by the Control Room administrator.

- c) Update the **Screen resolution settings** for existing device sessions.

The screen resolution settings are used to begin user sessions at the resolution specified in this setting. You can customize the screen resolution settings at the device level only if the allows users to override the resolution option is enabled by the Control Room administrator.

- d) Update the **Deployment settings** for single or multiple user devices and use the **Use custom settings** option to set the threshold settings for CPU and memory utilization at the device level.

For single users installed at the system level, the default deployment type is regular; you can change this to RDP. For multiple users installed at system level, the default deployment is RDP. For single users installed at the user level and multiple users at the system level, you cannot updated the deployment type.

For multiple user devices, additionally configure the **Concurrent sessions supported**. The minimum concurrent session value is **2**.

You can customize the threshold settings only if the enable threshold settings option is enabled by the Control Room administrator.

- e) Update the **Advanced Options** at the device level such as auto-login timeout, bot launcher JVM options, console readiness wait time, bot response wait time, RDP command options and log collection by selecting the **Use custom settings** option.

You can customize the advanced options only if the allow changes in the edit device page option is enabled by the Control Room administrator.

**3. Click **Save changes**.**

If the user device is offline, these changes take effect when the device reconnects to the Control Room.

**Related tasks**[Configure default device settings](#)

Configure the device settings to automatically set a user's current device as the default device after the user logs in to the Control Room.

[Change screen resolution for Bot Runner session](#)

For multi-user devices, you can set the screen resolution of the Bot Runners for every bot deployment through the RDP in the Control Room.

[Configure auto-delete temporary device settings](#)

Configure your device settings to automatically delete a temporary device when the device is disconnected from the Control Room after a certain time interval.

[Configure threshold settings for user devices](#)

Configure the CPU utilization and device memory threshold values to control the concurrent bot deployment on user devices based on resource utilization.

[Configure auto-login settings](#)

Configure auto-login settings in the Control Room to either create user sessions or reuse existing user sessions to reduce the bot startup time.

## Workload management

The workload management module enables users to upload Microsoft Excel and CSV files to the Control Room so that it feeds the records from the files into the bot deployments.

These records contain highly sensitive information, for example, PII, PCI, PHI, and more. This data is carefully protected by the data encryption key and is at rest in the file share and database.

Divide your automations into small, logical Work Items from the **Workload** page. Process the Work Items simultaneously to ensure that your automation goals are achieved with optimum resource utilization.

### Prerequisites

To manage your workload automation, ensure that you are allocated a combination of any or all of the following roles and permissions:

Feature type	Privileges
User roles	<ul style="list-style-type: none"> <li>AAE_Admin</li> <li>AAE_Queue_Admin</li> <li>AAE_Pool_Admin</li> </ul>
Activity permissions	<ul style="list-style-type: none"> <li>View my in progress activity</li> <li>View my scheduled bots</li> <li>Schedule my bots to run</li> </ul>
Device permissions	<ul style="list-style-type: none"> <li>View and manage my Bot Creator, Bot Runner, and device pools</li> <li>Create device pools</li> <li>Administer all device pools</li> </ul>

Feature type	Privileges
Bots permissions	<ul style="list-style-type: none"> <li>View my bots</li> <li>Run my bots</li> </ul>
Workload permissions	<ul style="list-style-type: none"> <li>View and manage my queues</li> <li>Create queues</li> <li>Administer all queues</li> </ul>

Watch the following video on how to use the Workload feature in the Control Room:

### Related tasks

[Attach work item template to TaskBot](#)

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

[Use Work Item variables](#)

You can use the Work Item variables to pass the Work Item attributes or values to the TaskBot from the Control Room when you run the bot with the option **Run bot with queue**.

### Related reference

[Workload package](#)

The Workload package enables you to insert work items in a queue for workload automation. It also enables data chaining between multiple queues. You can orchestrate multiple bots, and enable optimal device utilization through the queuing mechanism of workload management.

## Create workload queues

A queue is one of the main building blocks of Workload Management (WLM). A queue holds data known as Work Items for further processing. The system distributes these Work Items to individual unattended Bot Runners in a device pool for processing.

For workload automation create and attach a work item template to a bot, create device pools, add Bot Runners to the pool, create queues, add queue owners/participants/consumers, define the work item structure, insert work items, and finally run the automation with the queue.

### 1. *Create queues using default workload parameters (express queues)*

Create queues with default parameters for workload automation using the express queue option in the Control Room.

### 2. *Create and attach work item template to a bot*

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

### 3. *Create device pools and add bot runners to the pool*

Create a device pool with a unique name and add Unattended Bot Runners to the device pool.

### 4. *Create queues*

Create queues that hold specific sets of data your bot is expecting for automation. To create queues, an Control Room administrator assigns the **AAE\_Queue Admin** role with **View and manage my queues**, **Create queues**, **Administer all queues**, and **View my in progress activity** permissions.

### 5. *Add queue owners*

Add queue owners who can create, edit, and view queues.

**6. *Add participants to queue***

Add queue participants from different roles defined in the Control Room. This is an optional step.

**7. *Add consumers of queues***

Add queue consumers from different roles defined in the Control Room. This is an optional step.

**8. *Define Work Item structure***

Define the Work Item structure for processing in a queue. This enables you to manually upload the Work Items from the system in the absence of ready data in a file.

**9. *Insert Work Items***

Add Work Items from an Excel or CSV file to the queue after you define the structure.

**Related concepts**[Run bot with queue](#)

Collectively process all work items of a queue across all the Bot Runners present in one or more device pools.

**Related tasks**[Attach work item template to TaskBot](#)

Attach a work item template to a TaskBot to use the TaskBot in workload automation.

## Create express queues

Create queues with default parameters for workload automation using the express queue option in the Control Room.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

You must have the **Create queues** permission to create queues using the express mode.

When you create a queue with default parameters, note the following:

- All `.CSV` file columns will be available in a workload bot.
- The first 10 columns of the `.CSV` file will be displayed in the queue.
- All data type will be text.
- Queue sorting will not be available.

**1. Navigate to **Workload > Queues**.****2. To create queues with default workload parameters, click **Create express queue**.****3. Enter the queue name.**

The queue name is the same as the workitem template name by default.

**4. Optional: Enter the queue description.****5. To select a data file in `.CSV` format, click **Browse**.****6. Click **Create**.**

The queue is saved and available for workload automation in the **Queues** list.

You can now view queue details, edit a queue, and run a bot with queue.

**Related concepts**[Run bot with queue](#)

Collectively process all work items of a queue across all the Bot Runners present in one or more device pools.

### Related tasks

[View queue details](#)

Use the **View queues details** page to view the details of a particular queue.

[Edit queues](#)

Edit a queue using two methods - from the **Queues** list, or from the **View queue** page.

## Create queues

Create queues that hold specific sets of data your bot is expecting for automation. To create queues, an Control Room administrator assigns the **AAE\_Queue Admin** role with **View and manage my queues**, **Create queues**, **Administer all queues**, and **View my in progress activity** permissions.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

A queue is processed until all work items are completed. When new work items are added to the queue, the Reactivation Threshold value specifies the minimum number of new work items required to resume queue processing. Work items are those items with a **Ready to Run** status.

Create a queue by providing details such as the queue name, queue owners, participants, consumers, and work item structure.

---

**Note:** You can choose to **Create draft of queue** and add the remaining information later.

---

1. Navigate to **Workload > Queues**.
2. Click **Create queue**.
3. Enter the **Name**.
4. Optional: Enter a description.
5. Set the **Reactivation Threshold** to resume queue processing.  
Default threshold is **1** (one).
6. Optional: Select the average **Time required for a person to complete one work item**:
  - **seconds**
  - **minutes**
  - **hours**
  - **days**
7. Click **Next**.

[Add queue owners](#)

### Related tasks

[Edit queues](#)

Edit a queue using two methods - from the **Queues** list, or from the **View queue** page.

[Delete queues](#)

Delete a selected queue, multiple selected queues, or all queues of work items.

## Add queue owners

Add queue owners who can create, edit, and view queues.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Queue owners are allowed to edit the queue and add new work items to the queue.

The queue creator is the default queue owner and is able to add other Control Room users as queue owners, if required.

1. Select user(s) from the **Available Users** list from the **Owners** tab.
2. Click the right arrow (→) to add your selection.
3. Click **Next**.

#### *Add queue participants*

## Add participants to queue

Add queue participants from different roles defined in the Control Room. This is an optional step.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Participant roles can add new work items and view the queue. However, they are not allowed to edit other queue properties.

1. Select role(s) from the **Available Roles** list from the **Participants** tab.
2. Click the right arrow (→) to add your selection.
3. Click **Next**.

#### *Add consumers of queues*

## Add consumers of queues

Add queue consumers from different roles defined in the Control Room. This is an optional step.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

There are certain mandatory checks that are to be done for unattended bots to be deployed from Control Room to a device:

- The device where the bot is to be deployed should be set as a default device to only the specific bot runner account.
- Ensure that all necessary privileges have been granted to the Bot Runner.
- Ensure that nobody is signed into the device at the time of bot deployment with the Run As permission from a different device.
- Ensure that the console is currently inactive on default device.

Queue consumers can view the queue and all the work items in the queue. In addition, they can use this queue for running bots on Unattended Bot Runners.

1. Select role(s) from the **Available Roles** list from the **Consumers** tab.
2. Click the right arrow (→) to add your selection.
3. Click **Next**.

#### *Define Work Item structure*

## Define Work Item structure

Define the Work Item structure for processing in a queue. This enables you to manually upload the Work Items from the system in the absence of ready data in a file.

Define a Work Item structure using any one of the following methods:

1. Using an Excel/CSV file.
2. Using an existing work item template.
3. Manually

---

**Remember:** The work flow to process Work Items differs for a queue based on the method that you choose in the **Define Work Item Structure** tab.

---

1. Select a method to add header columns for Work Item processing:

- **Use an Excel/CSV file:** Add the header columns from an existing Excel or CSV file. *You can point to the Excel spreadsheet or CSV file you are using in one or more TaskBots you will run in this queue.*

- a. Enter a unique name for the Work Item structure in the **Work item template** field.

For example, if the queue contains employee information, you can specify the **Work item template** as Employee Data.

- b. Select a column for inclusion in the Work Item structure from the list of column names. The columns are defined based on the header rows of the selected Excel or CSV file. A maximum of ten (10) columns are allowed for selection and viewing in the Control Room.

For example, you can select column headers Employee Name, Employee ID, and Designation. You can then select the **Data Type - Text, Number, or Date** for that column. You can also choose to view these columns being processed in the **Activity** page.

---

**Note:**

- The system allows you to filter/sort Work Items on the columns for viewing the Work Item data in the Control Room.

*Actions allowed on view queue page*

- When you upload work items from an xls or xlsx file with data type as text, the Excel file column populated with a date in any format (for example, 8/6/2019) is converted to its corresponding WLM date format (for example, Sat Jun 08 00:00:00) in the Control Room Work Item. However, the same is not applicable to a csv file.

- c. Select up to three columns for sorting in an ascending or descending order.

When the system processes the Work Items from the queue, it uses the sort criteria specified to retrieve the Work Items in that order. For example, to process payslips with first Employee

ID followed by Employee Name from 1 to n and A to Z, specify Employee ID and Employee Name in an ascending order.

- **Use work item template:** Add header columns by searching for an **Existing work item template** or from the **Available work item templates**.

This allows you to pass the values or attributes from the template to a TaskBot with the help of Work Item variables when you use the option **Run bot with queue**.

---

**Tip:** Search for an existing Work Item template when there are a large number of templates available for selection.

---

#### *Use Work Item variables*

- **Manually:** Define the Work Item structure manually. You do not have to select from an existing structure.
  - a. Type a name for the Work Item structure in the **Work item template** field.  
For example, if the queue contains employee information, add the **Work item template** as Employee Data.
  - b. Add column header names for the Work Item and select the data type for each column: **Text**, **Number**, or **Date**
  - c. Select the display and sorting for the columns in the Control Room.  
When the system processes the Work Items from the queue, it uses the sort criteria specified to retrieve the Work Items in that order. For example, to process payslips with first Employee ID followed by Employee Name from 1 to n and A to Z, specify Employee ID and Employee Name in an ascending order.

2. Click **Next** to add the Work Items.

#### *Insert Work Items*

#### **Related reference**

##### [Work item status and actions](#)

Based on the Work Item status, you can do only certain actions on a Work Item.

## Insert Work Items

Add Work Items from an Excel or CSV file to the queue after you define the structure.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Add Work Items from an Excel or CSV file to the queue.

---

**Note:** When you upload work items from an xls or xlsx file with data type as text, the Excel file column populated with a date in any format (for example, 8/6/2019) is converted to its corresponding WLM date format (for example, Sat Jun 08 00:00:00) in the Control Room Work Item. However, the same is not applicable to a CSV file.

---

You can also add Work Items later by editing the queue, see [Edit queues](#).

1. Click **Browse**.
2. Select the Excel or CSV file.
3. Click **Create queue**.

- Now that you have created a queue, it is now ready for deployment from a bot.

*Run bot with queue*

- Manage Work Items of a queue to fix the discrepancies before queue processing and reduce your automation-related errors.

*Manage Work Items*

## Run bot with queue

Collectively process all work items of a queue across all the Bot Runners present in one or more device pools.

To run a bot with queue, ensure you are allocated a combination of any or all of the following roles and permissions:

Feature type	Privileges
User roles	<ul style="list-style-type: none"> <li>• AAE_Admin</li> <li>• AAE_Queue_Admin</li> <li>• AAE_Pool_Admin</li> </ul>
Activity permissions	<ul style="list-style-type: none"> <li>• View my in progress activity</li> <li>• View my scheduled bots</li> <li>• Schedule my bots to run</li> </ul>
Device permissions	<ul style="list-style-type: none"> <li>• View and manage my Bot Creator, Bot Runner, and device pools</li> <li>• Create device pools</li> <li>• Administer all device pools</li> </ul>
Bots permissions	<ul style="list-style-type: none"> <li>• View my bots</li> <li>• Run my bots</li> </ul>
Workload permissions	<ul style="list-style-type: none"> <li>• View and manage my queues</li> <li>• Create queues</li> <li>• Administer all queues</li> </ul>

Use the **Run a bot with queue** option from any of the following pages:

1. **Activity > Scheduled**
2. **Bots > My Bots > Public** page
3. **Workload > Queues** page

The procedure for running a bot with a queue is the same in all these pages. To **Run bot with queue**, note the following:

- You can run bots only on unattended Bot Runners. You cannot run bots on attended Bot Runners from the Control Room.
- The bots have to be checked in to the public folder in order for the bots to qualify to be run with queue.

- Only those queues associated with the work item template of the bot are available for selection for which you are the queue consumer.

To process the work items using the Bot Runners, choose the TaskBot to run, select a queue, add a Bot Runner, and assign it to a device pool.

### Related tasks

[View automation of a queue](#)

Use the **View activity in progress** page to view the automation details of the selected queue, **Pause**, **Resume**, or **Stop** the in-progress automation.

### Related reference

[Bot deployment and concurrent operations](#)

List of maximum concurrent operations and estimated deployment times.

## Add TaskBots and dependent files

Add a TaskBot, and review the input values and dependent files for the automation.

1. Navigate to **Activity > Scheduled, Bots > My Bots**, or **Workload > Queues** page.
2. Click **Run bot with queue**  
The **Activity > Run bot with queues Create** page is displayed.
3. Enter a name for the automation.
4. Optional: Enter a description.  
For example, you can describe the purpose of running the TaskBot with a queue.
5. Go to the folder that contains the required TaskBot.
6. Select a TaskBot to process in the queue from the list.  
By default, the Bots folder is selected.

---

**Tip:** Use the search field to find a TaskBot quickly.

---

The **Input values** and **Dependencies** options are displayed at the bottom of the page.

7. Optional: Select the **Input values** check box to add the values of variables to the bot during runtime.  
This is enabled only if the selected TaskBot has **Input values**.
8. Optional: Review the list of dependent files, if available.  
This list is enabled only if the selected TaskBot has dependencies. The TaskBot dependencies that are uploaded in the Control Room are available only for review.
9. Click **Next** to add a queue, Bot Runner and device pool.  
*Add queue, Bot Runner, and device pool*

If the selected TaskBot does not contain a work item template, an error message appears at the top of the page. The TaskBot also shows an icon to indicate a missing work item template.

[Define Work Item structure](#)

### Related reference

[Bot dependencies](#)

Bots dependencies are files and other bots that are required to run that bot successfully.

## Add queue, Bot Runner, and device pool

Add a queue, Bot Runner, and device pool to the automation from the **Run bot with queue** page.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Automation processes are queued until the specified **Run as user** and devices become available. Queuing permits other automation processes for that specific **Run as user** until the specified device becomes available. Any **In use** queues are shown as disabled in the **Available queues** list.

---

**Note:** For Workload management automations, the device login credentials must be the same for all devices available in a device pool.

---

You can deploy the automation on the number of users that you choose with the **Run as** option and not on the total number of devices available in a device pool. Select only those queues that are not in use.

---

**Note:** You cannot use multiple queues to add Bot Runners.

---

1. Select a **Queue** from the **Queues** list.
2. Click **Next**.
3. In the **Run as** tab, select a **Bot Runner** from the **Available bot runners** list.  
 Select the **Run on default Devices** option when you want to select Bot Runners that are mapped one-on-one with their default devices. This option enables the Work Items to be deployed only to the user's default device where the security policy does not allow a user to log in to any other device or devices.  
 If you select this option, ensure that all the default devices are part of the same device pool when you select from the **Device Pool** tab in Step 5.
4. Click **Next**.
5. In the **Device pool** tab, select a **Device Pool** from the **Available device pools** list.
6. Click **Add**.  
 The queue and device pool are added to the run bot with the queue list.
7. Optional: Click **Remove** to replace the queue or the device.
8. Click **Run bot with queue**.  
 The queue status changes to **In use** on the **Queues** page.

## Manage workload queues

For workload maintenance tasks such as view the details of queues to pause, stop, or resume its automation, edit the queues, manage the work items in the queue, and delete the queues.

### Workload maintenance tasks

For workload automation maintenance, do the following (in any order):

[View queue details](#)

Use the **View queues details** page to view the details of a particular queue.

[Edit queues](#)

Edit a queue using two methods - from the **Queues** list, or from the **View queue** page.

*Delete queues*

Delete a selected queue, multiple selected queues, or all queues of work items.

*Manage Work Items*

Manage Work Items of a queue to fix the discrepancies before queue processing and reduce your automation-related errors.

**Related reference**[Actions allowed on view queue page](#)

Use different actions such as sorting, searching, or filtering on the table view of the queues.

## View queue details

Use the **View queues details** page to view the details of a particular queue.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Permissions required:

1. **Queue Owner** or **Queue Participant** or **Consumer** rights
2. **View and manage my Queues** feature permission

The **View queues** page which shows details of the queue:

- **New** when the work item is added to the queue recently.
- **On hold** when the work item is deferred from processing by a Queue owner, participant, or consumer.
- **Failed** when the work item processing failed on an unattended bot.
- **Completed** when the work item is successfully processed by a Bot Runner or marked Completed by a queue owner, participant or consumer.
- **Data error** when there is an error in loading data from the file.
- **Active** when the work item is currently being processed or staged for processing.
- **Ready to run** when the work item is successfully processed for execution does not have any data errors and can be staged for processing.

Queue contents in different tabs such as:

1. **Work Items:** This is the default view. This allows you to view all work items in a tabulated form. You can use the filter to view specific work items. For example, all work items with status as **Completed**. You can **View**, **Edit**, or **Delete** the individual work items in each row. You can also change the status of the work items in bulk. For example, change the status of all the work items in **Data error** to **On hold**.
2. **General:** View the **Reactivation Threshold** and **Time** required to complete one work item.
3. **Owners:** View the user names of queue owners who can edit the queue and add new work items.
4. **Participants:** View the user names of queue participants who can add new work items and view the queue.
5. **Consumers:** View the user names of consumers who can view the queue and all the work items in the queue. In addition, they can use this queue when running bots.
6. **Work Item Structure:** View the work item structure that you defined when creating the queue.

---

**Tip:** Edit any of these details by either clicking the **edit this queue** link or the **Edit** button. Also, delete the queue by clicking the **Delete** button.

---

1. Navigate to **Workload > Queues**.
2. Hover over the **Actions** icon for the queue.
3. Click **View**.

*[View automation of a queue](#)*

### **Related concepts**

[Manage Work Items](#)

Manage Work Items of a queue to fix the discrepancies before queue processing and reduce your automation-related errors.

### **Related tasks**

[Create queues](#)

Create queues that hold specific sets of data your bot is expecting for automation. To create queues, an Control Room administrator assigns the **AAE\_Queue Admin** role with **View and manage my queues**, **Create queues**, **Administer all queues**, and **View my in progress activity** permissions.

[Edit queues](#)

Edit a queue using two methods - from the **Queues** list, or from the **View queue** page.

[Delete queues](#)

Delete a selected queue, multiple selected queues, or all queues of work items.

### **Related reference**

[Actions allowed on view queue page](#)

Use different actions such as sorting, searching, or filtering on the table view of the queues.

## Edit queues

Edit a queue using two methods - from the **Queues** list, or from the **View queue** page.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Permissions required:

1. **AAE\_Queue Admin** role.
2. **Queue Owner** rights to edit queues that you created.
3. **Queue Participant** rights to edit queues that are created by other queue owners.

Edit a queue from the **View queue** page or from the **Queues** list.

1. Navigate to **Workload > Queues**.
2. Hover over the **Actions** icon for the queue.
3. Click **Edit**.
4. Click either of the following to launch the **Edit Queue** page.
  - **edit this queue** link.
  - **Edit** button.
5. Edit the queue details such as the queue name (applicable only if in draft), description, work items, threshold and time values, owners, participants, and consumers.

---

**Note:** The Work Item structure cannot be edited after it is defined.

---

6. Upload a file for the work item that will be used for processing in this queue.  
The **Work Items** tab is shown by default.

---

**Tip:** You can search for a work item quickly based either on **Status** or **Status details** using the search option.

---

7. Click **Browse**.
8. Select the file to upload.

---

**Note:** You can upload only an Excel or CSV file.

---

9. Click **Save changes**.
10. Edit the name and save the changes made to the queue.  
An edit successful message appears.

### Related concepts

[Manage Work Items](#)

Manage Work Items of a queue to fix the discrepancies before queue processing and reduce your automation-related errors.

### Related tasks

[Create queues](#)

Create queues that hold specific sets of data your bot is expecting for automation. To create queues, an Control Room administrator assigns the **AAE\_Queue Admin** role with **View and manage my queues**, **Create queues**, **Administer all queues**, and **View my in progress activity** permissions.

### Related reference

[Actions allowed on view queue page](#)

Use different actions such as sorting, searching, or filtering on the table view of the queues.

## Delete queues

Delete a selected queue, multiple selected queues, or all queues of work items.

You must have the following rights and permissions to complete the task. Ensure you are logged in to the Control Room as the administrator. To complete the task, you must have **AAE\_Queue Admin** role and **Queue Owner** permission assigned to you.

---

**Note:** You cannot delete a queue if it is being used for processing a work item. An error message appears for that particular queue.

---

1. Log in to the Control Room.
2. Go to **Manage** → **Queues**.

### 3. Do the following to delete selected or multiple queues:

Option	Steps
<b>Delete selected queue</b>	<ol style="list-style-type: none"> <li>a. Hover over a queue to delete.</li> <li>b. Click the <b>Actions</b> menu.</li> <li>c. Click the <b>Delete</b> button. A confirmation message to permanently delete the queue appears.</li> <li>d. Click <b>Yes, delete</b> to confirm or <b>No, cancel</b> to discard the action. A confirmation message appears after you delete the queue.</li> </ol>
<b>Delete multiple selected or all queues</b>	<ol style="list-style-type: none"> <li>a. Select the check box of required queues or select the check box given in the header to select all queues.</li> <li>b. Click the <b>Delete</b> button above the header. A confirmation message to permanently delete multiple queues appear.</li> <li>c. Click <b>Yes, delete</b> to confirm or <b>No, cancel</b> to discard the action. A confirmation message appears after you delete the queue.</li> </ol>

#### Related tasks

[View queue details](#)

Use the **View queues details** page to view the details of a particular queue.

[View automation of a queue](#)

Use the **View activity in progress** page to view the automation details of the selected queue, **Pause**, **Resume**, or **Stop** the in-progress automation.

[Edit queues](#)

Edit a queue using two methods - from the **Queues** list, or from the **View queue** page.

## Actions allowed on view queue page

Use different actions such as sorting, searching, or filtering on the table view of the queues.

### Searching and filtering

For ease of access, apply search parameters to **Status** and **Queue Name** columns.

- Specify the search parameters in the search bar for **Queue Name**. When you specify search parameters for the same column, the system searches using **OR** operator. When you specify search parameters for different columns, the system searches using **AND** operator.
- Choose the search parameters from a list in the search bar for Work Item **Status**.

## Table items

The following describes the list of items that can be viewed in the table:

Table Item	Description
ID	Shows the system generated id for a work item. When a work item is added to a queue, system generates an id for that work item.
Status	Shows Work item status: Use the <b>View queues details</b> page to view the details of a particular queue.
Start Time and End Time	Shows the Work Items processing start/end time and date.
Modified by	Shows the name of the user who had modified the Work Item last.
Last Modified	Shows the time and date when the Work Item was modified last.

---

**Note:** Apart from the above system generated columns, the fields that you define in your work item are also displayed as columns.

---

## Actions on table column

Use the following actions on a table column:

- Click a column to sort it in ascending and descending order. You can sort up to three columns by holding the Shift key when you click two more columns. This gives you the option of sorting two additional columns. This way the sorting is done on the entire table and not just the data that is currently visible to you. The last sorting is stored in memory applied by a user per session.
- Drag a column to the left or right
- Move your mouse cursor at the end of the column and drag to re-size

## Actions on Work Items

Use the following tasks on specific Work Items:

Table Item	Description
Refresh	Allows you to refresh the table contents so that you can view the latest Work Item status
Delete	Allows you to delete one or multiple Work Items.
Mark complete	Allows you to mark one or more Work Items as <b>Complete</b> whose status is <b>On hold, Data Error, or Ready to run.</b>
New	Allows you to mark one or more Work Items as <b>New</b> whose status is <b>On hold, or Data Error</b>

Table Item	Description
On hold	Allows you to mark one or more Work Items as <b>On hold</b> whose status is <b>New</b>
Customize columns	Allows you to show or hide specific columns. By default, all columns are displayed including the ones defined in the Work Item.

Alternately, select Work Items and use the following actions. Note that these actions can be performed only at a table level and not on individual Work Items.

Table Item	Description
View	Allows you to view details of selected Work Item.
Edit	Allows you to edit details of selected Work Item. You can see this icon only if you are the <b>Queue Owner</b> or <b>Participant</b> or <b>Consumer</b> and the status of the Work Item is <b>Unsuccessful</b> , <b>On hold</b> , or <b>Data error</b>
Delete	Allows you to delete the selected Work Item. Note that if a Work Item is in <b>Active</b> state, you are not allowed to delete it.

### Related tasks

#### [Define Work Item structure](#)

Define the Work Item structure for processing in a queue. This enables you to manually upload the Work Items from the system in the absence of ready data in a file.

## View automation of a queue

Use the **View activity in progress** page to view the automation details of the selected queue, **Pause**, **Resume**, or **Stop** the in-progress automation.

You must have the following rights and permissions to complete the task. Ensure you are logged in to the Control Room as the administrator. To complete the task, you must have the following permissions assigned to you:

- **AAE\_Queue Admin** role
- **Queue Consumer** or **Queue Participant** rights
- **Manage everyone's In progress activity** feature permission

---

### Note:

- Though the **View automation** page is accessible from the **Workload** module, the page is launched from the **Activity** module.
- You cannot **Pause/Resume** or **Stop** actions directly from the **Activity > In progress** page. For these actions, the **Manage > Queues > View automation** action is used.

- 
1. Log in to the Control Room.
  2. Go to **Manage** → **Queues**.
  3. Hover over a queue with status **In use**.

4. Click the Actions menu (vertical ellipsis) and select **View automation**. This launches the **Activity > Run bot with queue > View** page.
5. Choose from the following options to view automation of a queue:

Options	Description
<b>Automation details of the queue</b>	<ul style="list-style-type: none"> <li>• The Bot name, path, dependencies, and if it requires administrative privileges to run in the <b>Task Bot</b> tab.</li> <li>• The Queue used to run the automation in the <b>Queue</b> tab.</li> <li>• Bot Runner details such as username, device, and user status in the <b>Run as</b> tab.</li> <li>• Details of the device pool in use to run the automation in the <b>Device pool</b> tab.</li> <li>• Details such as number of work items that were active, failed, pending, or completed processing in the <b>Run history</b> tab.</li> </ul>
<b>Pause</b>	<p>The system pauses the distribution of work items from this queue to available bot runners in the device pool.</p> <hr/> <p><b>Note:</b> Until you resume this automation, any work items with <b>Ready to Run</b> status from this queue are not sent for processing.</p> <hr/>
<b>Resume</b>	The system starts distributing the work items from this queue.
<b>Stop</b>	<ul style="list-style-type: none"> <li>• The system stops distributing the work items from the queue associated with this automation.</li> <li>• Select <b>No, cancel</b> to return to the details page or <b>Yes, stop</b> to stop the work item processing and return to the <b>Queues</b> page.</li> </ul>

[Edit queues](#)

#### **Related tasks**

[View queue details](#)

Use the **View queues details** page to view the details of a particular queue.

[Delete queues](#)

Delete a selected queue, multiple selected queues, or all queues of work items.

## Manage Work Items

Manage Work Items of a queue to fix the discrepancies before queue processing and reduce your automation-related errors.

### Permissions required

You need any of the following permissions to manage the work items:

1. **AAE\_Queue Admin** role
2. **View and manage my Queues** feature permission
3. **Queue Owner, Queue Consumer, and/or Queue Participant** permissions

### View work items

View work items with a status of Completed, Unsuccessful, On hold, Active, or Data Error in the **View work item** page.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

From the **Workload > Queues** page, you can perform the following actions on either one queue or multiple queues, including:

- **Delete:** This will delete the work item permanently.
- **Mark complete:** This will mark the work item as complete.
- **Re-process:** This will mark the work item in **New** state.
- **On hold:** This will mark the work item as **On hold**.

---

**Note:** The **Start time** and **End time** are shown when the work item is being processed.

---

Select a queue to **View, Edit, or Delete** a queue.

1. Navigate to **Workload > Queues**.
2. Hover over the **Actions** icon for the queue.
3. Click **View**.

[Edit work items](#)

[Delete work items](#)

### Related reference

[Work item status and actions](#)

Based on the Work Item status, you can do only certain actions on a Work Item.

### Edit work items

Use the **Queues** page or the **Work item** page to edit the work items of a queue.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

You can edit a work item only if it is in a **New**, **On hold**, **Data error**, or **Failed** state.

1. Navigate to **Workload > Queues**.
2. Hover over the **Actions** icon for the queue.
3. Click **Edit**.
4. Change the work item status to **Mark complete**, **Defer**, or **Re-process** in the **Work item attributes and automation details** section.

You can reprocess the failed Work Items by editing and modifying from **Failed** to **Re-process**.

The system will set the status to **Data Error** during the data load if there is any issue with the data. For example, if a user enters a text value for a number field, or an invalid date string for an attribute of date type, the status will be displayed as **Data Error**.

[Work item status and actions](#)

5. Click **Save changes**.

[Delete work items](#)

## Delete work items

Delete work items one at a time or **in bulk** in the **View work item** page.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

---

**Note:** You can also delete a work item one at a time or **in bulk** using the **Delete** option provided above the Work items table.

---

1. Navigate to **Workload > Queues**.
2. Select the queue.
3. Hover over the **Actions** icon for the queue.
4. Click **Delete**.  
Confirm or cancel as required.

### Related reference

[Work item status and actions](#)

Based on the Work Item status, you can do only certain actions on a Work Item.

## Work item status and actions

Based on the Work Item status, you can do only certain actions on a Work Item.

### Work item - status and actions

The following table provides a description of each Work Item status and the action you can do on a Work Item having that status:

Work Item Status	Description	Actions
New	New Work Item is added	View, Edit, and Delete
Ready to run	Work Item is successfully processed for execution	View, Edit, and Delete

Work Item Status	Description	Actions
Active	Work Item is currently being processed	View
Completed	Work Item successfully processed by a Bot Runner	View and Delete
Failed	Work Item processing has failed to execute on unattended Bot Runners	View and Edit
Data Error	Data type mismatch when adding Work Items to the queue	View, Edit, and Delete
On hold	Work Item is deferred for use by the Queue admin	View, Edit, and Delete

### Related tasks

[Edit work items](#)

Use the **Queues** page or the **Work item** page to edit the work items of a queue.

[Define Work Item structure](#)

Define the Work Item structure for processing in a queue. This enables you to manually upload the Work Items from the system in the absence of ready data in a file.

## Managing packages

Users with the **Manage package** permission can upload and manage packages. Automation Anywhere provides you with the flexibility to decide which packages you want to make available to the Bot Creators for creating bots.

Users must have the appropriate administrative permission to view or manage action packages.

### View packages

A user with **View packages** permission can view the packages that are available to Bot Creators. Go to the **Bots > Packages** page to view **All packages**.

The **All packages** page lists all the packages in the Control Room that are available for Bot Creators. Packages can have multiple versions.

### Manage packages

A user with the **Manage packages** permission can add new packages to the Control Room and manage which packages versions are available in the Control Room.

Add packages from the **Bots > Packages > Add package**.

Manage packages from the **Bots > Packages > All packages > View package** page.

#### Set as default

Select a package and set is as the default. As soon as a package is set to default, it is the package that all Bot

Creators in the Control Room use.

### Disable

Disable a package so that users cannot use it to create new bots. Bots that were created using a disabled package continue to work.

### Delete

Deleting a package removes the actions contained in the package from the Control Room for all users.

---

**Important:** A package cannot be deleted if it is being used by a bot.

---



---

#### Note:

- Existing bots might be affected when existing packages are updated or disabled.
- It is recommended that Bot Creators update bots to use the latest version of a package.

---

Updates to packages by Automation Anywhere are available in each release of Automation 360. The latest updated package can be set to the default package by users and administrators with **Manage package** permission.

Watch the following video on how to update a package in Automation 360:

## Add packages to the Control Room

Administrators can add packages to the Control Room for use by Bot Creators.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Bots > Packages**.
2. Click **Add package**.
3. Click **Browse**.
4. Locate and select the package to add to the Control Room.  
Packages are Java Archive (JAR) files that contain actions used to create bots.
5. Click **Upload package**.
6. On the **Bots > Packages > Confirm package** page, choose any of the following options:
  - **Accept, enable and set as default:** Uploads and enables the selected package, and sets it to the default package for the Control Room.
  - **Accept and enable:** Uploads and enables the package, but the package is not set as the default package. Bot Creators have to specifically select non-default packages to use them for creating bots.

Choosing **Reject** stops the upload process.

- After installation, click **Administration** > **Packages** to verify that the package is added.

### Related concepts

[Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

### Related tasks

[Manage Control Room packages](#)

Manage packages in the Control Room by setting a package as default, disabling it, or deleting it.

## Manage Control Room packages

Manage packages in the Control Room by setting a package as default, disabling it, or deleting it.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

To manage packages in the Control Room, users must have **Manage package** permission.

Package management actions apply to all users; however, the user can select specific package versions within a bot.

- Navigate to **Bots** > **Packages**.
- Hover over the **Actions** icon for the package.
- Click **View**.
- Choose any of the following options:

Option	Description
<b>Set as default</b>	Select a package and set it as the default. As soon as a package is set to default, it is the package that all Bot Creators in the Control Room use.
<b>Disable</b>	Disable a package so that users cannot use it to create new bots. Bots that were created using a disabled package continue to work.
<b>Delete</b>	Deleting a package removes the actions contained in the package from the Control Room for all users.

---

**Important:** A package cannot be deleted if it is being used by a bot.

---

### Related concepts

[Managing packages](#)

Users with the **Manage package** permission can upload and manage packages. Automation Anywhere provides you with the flexibility to decide which packages you want to make available to the Bot Creators for creating bots.

### Related tasks

[Add packages to the Control Room](#)

Administrators can add packages to the Control Room for use by Bot Creators.

## Working with repositories, credentials and roles

Control room administrators configure repositories for Bot Creators to develop RPA bots. Administrators create roles, assign users, and grants permission to action packages used in creating bots.

This topic is intended for experienced Automation Anywhere Automation 360 users.

### Administrator tasks

Control room administrators setup repositories for Bot Creators to develop bots. For this process, administrators create users and assign these users specific roles, such as Bot Creators or Bot Runners. Bot Creators are granted access to specific RPA action packages to create, test, and run bots. Completed bots are transferred to the public repository for other users to deploy. The following is a breakdown of control room administrator related tasks to complete this process.

#### *Set up your bot repository*

Administrators create repositories for Bot Creators to develop , test, and debug bots. After configuring the repository, the administrator creates the role for the Bot Creator.

#### *Define the roles for your users*

Roles grant specific permissions to users, such as Bot Creators and Bot Runners.

#### *Create your users and assign their licensed roles*

Create or otherwise edit the user information to assign the licensed role for accessing repositories, packages, and bot building tools and functionality.

#### *Add packages to the Control Room*

Administrators can add packages to the Control Room for use by Bot Creators.

#### *Set up lockers and credentials in Credential Vault*

The credentials assigned are typically those where the administrator is granting some internal, business-related access to a Bot Creator or Bot Runner for RPA development, for example to a Salesforce account.

### Bot Creator task

Bot Creators often require access to protected data to automate a process. Each Bot Creator is given credentials governing the data they are permitted to access. The administrator creates the credential and assigns it to individual users by configuring specific roles for the Bot Creator to access those credentials. Bot Creators must add their own specific attributes to the credentials after they have been assigned by the administrator. See [Manage user credentials](#).

## Manage user credentials

Bot Creators and Bot Runners rely on credentials to access necessary data relevant to the bot building process.

This task is performed by the user who wants to build and deploy . You must have the necessary rights and permissions to complete this task, and authorization to log in to the as the licensed user.

Bot Creators often require access to protected data to automate a process. Each Bot Creator is given credentials governing the data they are permitted to access.

---

**Note:** Administrators are required to have created the necessary roles and entitlements assigned to the user in order to update and use any granted permissions.

---

**1. Navigate to **BOTS > Credentials > My Credentials.****

Select the credential to view and or manage.

**2. Click **Edit.****

The configurable fields for the credential are displayed, based on the user granted permissions.

For example, a bot is built that requires the authentication username and password to log in to a specific URL. The user will create a custom credential for this operation by amending the credential governed by the administrator, adding the additional security details. This way, the Bot Creator can authorize only that protected data deemed necessary for the automation.

**3. Click **Save changes.****

## Set up your bot repository

Administrators create repositories for Bot Creators to develop and build bots.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Administrators create repositories for Bot Creators to develop , test, and debug bots. After configuring the repository, the administrator creates the role for the Bot Creator.

**1. Log in to the as the administrator.**

**2. Navigate to **Bots > My bots.****

**3. Click **Create subfolder.****

**4. Provide the repository folder name and navigation path.**

This repository folder is where the bots created by Bot Creators will be stored.

**5. Click **Create folder.****

Create roles for users. Roles grant specific permissions to users, such as Bot Creators and Bot Runners.

## Define the roles for your users

Roles grant specific permissions to users, such as Bot Creators and Bot Runners.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Assign specific permissions to each user. You cannot select users, if these users are deactivated by the Control Room administrator.

**1. Navigate to **Administration > Roles.****

**2. Click **Create role.****

**3. Enter the **Name.****

**4. Optional: Enter a description.**

**5. Set the required permissions for the role associated with this repository.**

**6. Click **Bots.****

- Select the desired repository folder and grant associating permissions.

Option	Action
<b>Select all</b>	Grant all associated permissions for the repository.
<b>Run</b>	Permission to run bots from the repository.
<b>Check in</b>	Permission to import bots to the repository.
<b>Check out</b>	Permission to export the bot from of the repository.
<b>Delete from Public</b>	Permission to permanently remove bots from the Public repository.

- Optional: Click **RUN AS**.

This is where administrators select the specific device this role will have access to.

- Click **Create role**.

Assign this role to the appropriate Bot Creator users.

## Create your users and assign their licensed roles

Create a user and assign their specific license based role.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Create or otherwise edit the user information to assign the licensed role for accessing repositories, packages, and bot building tools and functionality.

- Navigate to **Administration > Users**.
- Click **Create user**.
- Enter the **Name**.
- Optional: Enter a description.
- Enter the following user details:

**Note:** The number of characters allowed in First name and Last name is 50.

Field	Value
<b>Enable User</b>	Select for the user to be able to log in immediately.
<b>Username</b>	Enter a unique user name.
<b>Description</b>	Enter a description for the user.
<b>First name</b>	Enter the first name for the user.
<b>Last name</b>	Enter the last name for the user.
<b>Password</b>	Enter and confirm a password for the user. Ensure the password follows any necessary password policy.

Field	Value
<b>Email</b>	<p>Enter and confirm the email address for the user.</p> <p>If SMTP is enabled, the user is sent an email to this address to confirm the account. All important Control Room notifications will be sent to this email address.</p> <hr/> <p><b>Note:</b> You can use the @ character to include email usernames.</p> <hr/>

6. Select a Role from the list of **Available roles**.
7. Assign the device Bot Creator license to the user.  
Enables user to create and run bots. Auto login enabled by default.
8. Click **Create user**.

Update the Bot Creator packages and grant permissions to this user to build, test, and run bots.

## Add packages to the Control Room

Administrators can add packages to the Control Room for use by Bot Creators.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Bots > Packages**.
2. Click **Add package**.
3. Click **Browse**.
4. Locate and select the package to add to the Control Room.  
Packages are Java Archive (JAR) files that contain actions used to create bots.
5. Click **Upload package**.
6. On the **Bots > Packages > Confirm package** page, choose any of the following options:
  - **Accept, enable and set as default:** Uploads and enables the selected package, and sets it to the default package for the Control Room.
  - **Accept and enable:** Uploads and enables the package, but the package is not set as the default package. Bot Creators have to specifically select non-default packages to use them for creating bots.

Choosing **Reject** stops the upload process.

7. After installation, click **Administration > Packages** to verify that the package is added.

### Related concepts

[Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

### Related tasks

[Manage Control Room packages](#)

Manage packages in the Control Room by setting a package as default, disabling it, or deleting it.

## Set up lockers and credentials in Credential Vault

Assign credentials to lockers for Bot Creators to access during the bot building process.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

The following process leads you through the setup for a , creating credentials and lockers, as well as assigning those credentials to specific lockers.

The credentials assigned are typically those where the administrator is granting some internal, business-related access to a Bot Creator or Bot Runner for RPA development, for example to a Salesforce account.

1. Navigate to **Bots > Credentials**.
2. Click **Create credential**.
3. Enter the **Credential name** and a **Description** for the configured credential or select **External key vault**.

If integrating with an external key vault, proceed to Step 5.

4. Enter the **Attribute name** and supply the **Description** for the attribute.
5. Select **Input**:

Input	Value
<b>Standard</b>	Enter the value. All users see the same credential value set by the credential owner.
<b>User-provided</b>	The value field is not available because the values are not preset during creation. Only users of the locker containing this credential can provide the value.

6. Set **Security**.  
All masked values will be shown as asterisks.
7. Click **Create credential**.
8. Click the **MY LOCKERS** tab.
9. Click **Create locker**.
10. Enter the **Name**.
11. Optional: Enter a description.
12. Click **Create locker**.

## Utility for key vault and database authentication configuration

This interactive utility helps the user to change the key vault and database authentication configurations.

User will execute this utility using the JRE that is being used by the control room, in the installation directory `C:\Program Files\Automation Anywhere\Enterprise`.

Download the jar file that will be used, click [External key vault utility](#).

## Argument variables

- `-configPath`

Full path of the configuration directory.

- `-action`

Select from the following:

- `UPDATE_KEY_VAULT_CONFIGURATION`

This allows for the mapping to an external key, based on these three options:

- `AWS`  
Connect to AWS Secret Manager.
- `CYBERARK`  
Connect to CyberArk.
- `NONE`  
Disable external key vault.

- `UPDATE_DB_AUTHENTICATION_CONFIGURATION`

Configure SQL authentication settings.

- `WINDOWS`  
Change to Windows authentication.
- `SQL`  
To change to SQL authentication where user provides username and password.
- `KEY_VAULT`  
To change to SQL authentication using external key vault.

---

**Note:** The client certificate issued to the Control Room for authenticating to CyberArk needs to be in .p12 (pkcs#12) format with the private key.

---

**Note:** The imported CyberArk server certificate needs to be imported to Java trust store before invoking dbutility commands. The certificate can be in .cer (PEM) format and does NOT contain a private key.

---

## Command

Execute this command within the directory `C:\Program Files\Automation Anywhere\Enterprise:`

```
> jdk11\bin\java --module-path .\lib\ -jar crutils.jar -configPath <Full path of the config directory> -action <UPDATE_KEY_VAULT_CONFIGURATION/UPDATE_DB_AUTHENTICATION_CONFIGURATION>
```

## Metrics for UPDATE\_KEY\_VAULT\_CONFIGURATION

These are the metrics used by the UPDATE\_KEY\_VAULT\_CONFIGURATION action.

Table 3: Key vault configuration metrics

Source → Destination	AWS	CYBERARK	NONE
AWS	YES	NO	YES
CYBERARK	NO	YES	YES
NONE	YES	YES	YES

---

### Note:

- To change KEY\_VAULT from one type of vault to another or to NONE, you must first manually set database and service account credentials that are currently being retrieved from the external key vault.
  - To change AWS to/from CYBERARK, user has to first change it to NONE.
  - To change NONE from AWS/CYBERARK, database should not be connected on KEY\_VAULT.
- 

This utility will prompt the user to provide specific input information based on the options selected.

## UPDATE\_KEY\_VAULT\_CONFIGURATION

### AWS

Region →

Region to get secrets from on AWS secret manager.

### CYBERARK

- Vault URL →

URL of the CyberArk password vault.

- Application ID →

The application identifier.

- Certificate Path →

Full path of the client certificate file.

- Passphrase →

Passphrase for the client certificate.

---

**Note:** Sometimes you will have to import a server certificate. Please follow these steps:

In the directory: C:\Program Files  
\Automation Anywhere\Enterprise, execute the following:

1. Enter

```
> jdk11\bin\java -jar certmgr.jar
-appDir . -importTrustCert <Full
path of the certificate>
```

2. Add these jvm arguments to the command for executing this utility.

a.

```
-
Djavax.net.ssl.trustStore="C:
\Program Files\Automation
Anywhere\Enterprise\pki
\trust\store.ks"
```

b.

```
-
Djavax.net.ssl.trustStorePassword=changeit
```

```
> jdk11\bin\java -
Djavax.net.ssl.trustStore="C:
\Program Files\Automation Anywhere
\Enterprise\pki\trust\store.ks" -
Djavax.net.ssl.trustStorePassword=changeit
--module-path lib -jar crutils.jar
-configPath <Full path of
the config directory> -action
<UPDATE_KEY_VAULT_CONFIGURATION/
UPDATE_DB_AUTHENTICATION_CONFIGURATION>
```

**NONE**

- If DB authentication is configured to use external key vault, the utility will throw exception as:

```
Database currently configured
to retrieve credentials from
key vault. Update database
authentication to WINDOWS/SQL to
proceed further
```

and exit.

- The utility might ask a confirmation to user:

```
Disable/update of key vault
may impact functionalities
using key vault (e.g. Active
Directory configuration, Email
Settings configuration). Make
sure to update these settings (if
any). Are you sure you want to
continue?
```

## UPDATE\_DB\_AUTHENTICATION\_CONFIGURATION

**WINDOWS**

The utility will use the current logged-in user credential to connect to the DB provided during installation.

**SQL**

- Username

- Password

## KEY VAULT

The utility will ask the user to provide input based on the key vault, and the connected control room.

### 1. AWS

Secret name → Name of the secret created on AWS secret manager of type database credentials or Plain Text with username and password as keys.

### 2. CYBERARK

Safe name → Name of the safe which has the credential.

Object name → Name of the credential.

### 3. NONE

The utility will send exception as

```
Key Vault configuration not found
```

and exit.

## Credentials and lockers in the Credential Vault

The Credential Vault securely stores sensitive information such as passwords, account numbers, and social security numbers in credentials and lockers for use in automation tasks. It facilitates role-based access for users of a Control Room and ensures that sensitive values are not stored in bots or on devices.

The Credential Vault consists of two main features: credentials and lockers.

### Credential

A credential holds the sensitive information in attributes. An attribute can have a value that is standard for all users or it can accept a user-input value. For example, an `Email` credential can hold three attributes: `host name` (standard value), `username` (user input), and `password` (user input).

By default, all users can create, manage, and use their own credentials. A user is granted access to another user's credentials by receiving access to a locker that holds the credential. If the credential requires a user-input value, it appears in the **CREDENTIAL REQUESTS** tab.

A credential must be assigned to a locker to be used for building and running a bot.

### Locker

A locker specifies which users can view, modify, or access the credentials. For example, a human resources (HR) locker can hold `Email`, `Database`, and `Training website` credentials and allow only specific employees of the HR department to use the credentials in their bots.

A user with either the `AAE_Locker Admin` role or a user-created role with the **Manage my credentials and lockers** permission configures

lockers, adds credentials, and grants access to other users.

## Benefits of using the Credential Vault

Apart from providing a secure and centralized location for storing credentials, using the Credential Vault also:

- Minimizes credential fraud.
- Provides an environment to enable improved security.
- Enables businesses to adhere to the processes and credential management compliance standards.
- Offers increased automation opportunities with secure data applications.

### Related concepts

[RBAC for Credential Vault credentials management](#)

Credentials created in the Control Room are used across Bot Creators and Bot Runners.

[Configure Credential Vault Connection mode](#)

Credential Vault is a centralized location for securely storing credential information used by bots.

## Set up locker and assign credentials

Create a role, credentials, and locker to share related sensitive values with a group of users, so they can use those values to build or run bots.

Do the following to set up the locker and assign credentials:

1. *Create and assign roles*  
Define a role and assign permissions to access various features for building bots.
2. *Create credential*  
Create a credential and add the required attributes.
3. *Create locker*  
Create a locker to group similar credentials and share with other users.

### Related concepts

[RBAC for Credential Vault credentials management](#)

Credentials created in the Control Room are used across Bot Creators and Bot Runners.

### Related tasks

[Edit a credential](#)

Modify credential details and add or remove attributes.

[Edit a locker](#)

Add or remove credentials, owners, managers, participants, or consumer roles.

## Create credential

Create a credential and add the required attributes.

This task is performed by the Automation Anywhere Control Room administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the Control Room as the administrator.

Assign the credential when adding the credential details. If no locker was created, create a locker and then assign the credential. Add up to 50 attributes to a credential.

1. Log in to the `aa` as the administrator.
2. Navigate to **Bots > Credentials**.
3. Enter the **Credential name** and a **Description** for the configured credential or select **External key vault**.

If integrating with an external key vault, proceed to Step 5.

4. Enter the **Attribute name** and supply the **Description** for the attribute.
5. Selecting **External key vault**

If integrating with an external key vault, such as AWS or CyberArk, enter the required credentials for the specified external vault:

**AWS**

Enter the password for the AWS vault.

**CyberArk**

Enter the protected passphrase for CyberArk.

6. Select **Input**:

Input	Value
<b>Standard</b>	Enter the value. All users see the same credential value set by the credential owner.
<b>User-provided</b>	The value field is not available because the values are not preset during creation. Only users of the locker containing this credential can provide the value.

7. Set **Security**.

All masked values will be shown as asterisks.

8. Optional: Select the **Set this attribute as password** option.

This option allows bots to input the attribute value only into fields that are identified as password fields.

9. Click **Create credential**.

Assign this credential to a locker.

## Edit a credential

Modify credential details and add or remove attributes.

A credential can be edited by the owner when the credential is not assigned to a locker. If a credential input type is user-provided, then locker consumers can edit the credential to input a value.

*[Role-based access and locker permissions](#)*

---

**Note:** A user with the **AAE\_Locker Admin** role can assign a credential to a new owner. For more information, see *[Transfer credential ownership](#)*.

---

1. Navigate to **Bots > Credentials**.
2. Hover over the **Actions** icon for the credential.
3. Click **Edit**.

#### 4. Edit the credential.

If the email notification setting is enabled and credentials are added to a locker, then all the locker consumers receive an email.

The maximum limit of credential attributes that is allowed is 50. If you have upgraded to the current version and have migrated credentials that have more than 50 attributes, when editing that particular credential, the following message displays: `Credentials can only have a maximum of 50 attributes`. To continue, remove the additional attributes that cannot be saved and add those to a new credential.

#### 5. Click **Save changes**.

### Related reference

#### [Credential Vault email notifications](#)

When the email notification setting is enabled, it ensures that users are notified of any changes to credentials and lockers.

## Transfer credential ownership

A user with the **AAE\_Locker Admin** role can transfer a credential to a different owner.

A credential can only be reassigned to a different owner if it is in a locker. The new owner can be either the locker owner, manager, or participant.

1. Navigate to **Bots > Credentials**.
2. Use the search bar to find the credential.
3. Hover over the vertical ellipses to the right of the credential.  
The actions menu opens.
4. Click **Transfer credential ownership**.  
A list of users with access to the locker appears,
5. Select the new credential owner.
6. Click **Yes, submit**.

## Create locker

Create a locker to group similar credentials to share with other users.

You must either have the `AAE_Locker Admin` role or **Manage my credentials and lockers** permission. [RBAC for Credential Vault credentials management](#)

One locker can hold up to ten credentials. A credential can only belong to one locker. See [Create credential](#). Credentials are further divided in logical groups called lockers.

To create a locker, follow these steps:

1. Navigate to **Bots > Credentials > My Lockers**.
2. Click **Create locker**.
3. Enter the **Name**.
4. Optional: Enter a description.
5. Select the **Credentials** to add to the locker or select **External key vault**.

**6. Enter External key vault credentials.**

If integrating with an external key vault, such as AWS or CyberArk, enter the required credentials for the specified external locker:

**AWS**

Enter the prefix of secrets stored in the locker.

**CyberArk**

Enter the safe name where the credential lockers are stored.

**7. Click Next.****8. Add the Owners.**

A locker must have at least one owner. The locker owner can edit, view, and delete a locker and also add or remove other owners.

**9. Click Next.****10. Optional: Add the Managers and click Next.**

The locker manager can view, edit and delete the locker, and add participants but cannot add owners or managers to the locker.

**11. Optional: Add the Participants and click Next.**

A locker participant has access to view a locker and add their own credentials to a locker.

---

**Note:** A **locker participant** does not have access to or visibility of credentials created by other users.

---

**12. Add the Consumers.**

Select one or more roles. Users with these roles have access to the locker. System-created roles are not shown in the **Consumers** list.

Type	Permission
<b>Standard</b>	Locker consumers can view the locker and all the credentials inside the locker. All consumers see the same credential value set by the credential owner.
<b>User-provided</b>	Locker consumers can input their information in user-provided credentials with user-provided attributes.

**13. Click Create locker.**

If the email notification setting is enabled, users receive an email confirming the locker name and their permissions to that locker.

## Edit a locker

Add or remove credentials, owners, managers, participants, or consumer roles.

Only a locker owner or locker admin can edit a locker. To edit a locker, follow the steps mentioned below:

1. Navigate to **Bots > Credentials > My Lockers**.
2. Hover over the **Actions** icon for the locker.
3. Click **Edit**.

## 4. You can make changes to the following:

Option	Description
<b>Credentials</b>	Add or remove credentials that are assigned to a locker.
<b>Owners</b>	Add or remove locker owners. <hr/> <b>Note:</b> A locker must have at least one owner. <hr/>
<b>Managers</b>	Add or remove locker managers.
<b>Participants</b>	Add or remove locker participants.
<b>Consumers</b>	Add or remove locker consumers.

If email notification setting is enabled and credentials are added to a locker, then all the locker consumers will receive an email.

5. Click **Save changes**.

## Credential Vault email notifications

When the email notification setting is enabled, it ensures that users are notified of any changes to credentials and lockers.

### Overview

Email notifications are sent for the following scenarios:

**Credential is added to a locker**

When credential is added to a locker, a notification is sent to all consumers of the locker to their email address registered in the Control Room. The email consists of a link to the credential that is added to the locker. The consumers are redirected to edit the credential page wherein they input the credential value.

**Member is added or removed from a locker**

An email notification is sent when a new member (co-owner or participant) is added to a locker or removed from the locker as a member of participant.

**Change in permission for locker members**

When a locker owner/admin grants or removes locker membership permissions from a locker, an email notification is sent to the locker members at their email address. This ensures that members are notified of their membership changes within the locker.

**Locker consumer gets added or removed from a role assigned to a locker, or consumer role gets added or removed from a locker**

When a role assigned to a locker is modified by addition or removal of users, an email notification is sent to the new or existing user at their email address so that the consumers are notified that credentials are pending for their input in the locker.

Also when a new role added to a locker or an existing role is revoked from the locker, an email notification is sent to the new or existing consumers at their email address so that the consumers are made aware of the changes.

## Administration

Control Room administrators manage settings related to the database, Credential Vault, users, roles, action packages, licensing, and more.

Learn more about:

### Related tasks

#### [Create and assign roles](#)

Administrators configure roles with permissions to access features and perform operations such as create, edit, or delete a bot in the Control Room.

#### [Create a user](#)

Create a user and assign their specific license based role.

#### [Installing additional licenses](#)

Upload new licenses to the Automation Anywhere Control Room to be distributed to users as required.

#### [Create credential](#)

Create a credential and add the required attributes.

## User management

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

### Column actions

- Click a column header to sort by ascending or descending order.
- Drag and drop a column header to move the column left or right.
- Drag the end of a column corner to re-size.

### Individual user actions

Perform the following tasks on an individual user:

#### **View**

Opens the **View user** page in read-only mode. It shows user details, assigned roles, and general details such as **Last Modified**, **Modified by**, **Object type**, and **User type**.

You can edit a user detail and enable or disable a user.

<b>Edit</b>	<p>Opens the <b>Edit user</b> page in write mode. You can update user details, device login credentials, assigned roles, and device licenses.</p> <p>When you edit a user, an email is sent notifying the user if SMTP is enabled.</p> <p>Only user devices with the Bot agent installed at the system level are available for selection as the default device.</p>
<b>Enable   Disable</b>	<p>Activates or deactivates the user. When you enable or disable a user, an email is sent notifying the user if SMTP is enabled.</p>
<b>Delete</b>	<p>Deletes the user. This is useful when users leave an organization or move to another role. This frees both the device to which the user was attached and the allocated license.</p> <p>When you delete a user, an email is sent notifying the user if SMTP is enabled.</p>

### Table-level actions

Perform the following tasks by hovering the mouse over the icons at the top-right of the **User** table. These actions can be performed only at a table-level and not on individual items.

<b>Create role with checked items</b>	<p>Adds a role and assigns the selected users.</p> <p><i>Create a user</i></p>
<b>Delete checked items</b>	<p>Deletes the selected users. You cannot delete a user who is currently logged in.</p>
<b>Export to CSV</b>	<p>Exports the selected users in the table in CSV format.</p>
<b>Refresh</b>	<p>Refreshes the table and reflects the latest data.</p>
<b>Customize columns</b>	<p>Select the columns to show or hide in the table.</p>

### Create a user

Create a user and assign their specific license based role.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Administration > Users**.
2. Click **Create user**.
3. Enter the following user details:

**Note:** The number of characters allowed in First name and Last name is 50.

Field	Value
<b>Enable User</b>	Select for the user to be able to log in immediately.

Field	Value
<b>Username</b>	Enter a unique user name.
<b>Description</b>	Enter a description for the user.
<b>First name</b>	Enter the first name for the user.
<b>Last name</b>	Enter the last name for the user.
<b>Password</b>	Enter and confirm a password for the user. Ensure the password follows any necessary password policy.
<b>Email</b>	Enter and confirm the email address for the user. If SMTP is enabled, the user is sent an email to this address to confirm the account. All important Control Room notifications will be sent to this email address.  <b>Note:</b> You can use the @ character to include email usernames.

4. Select a Role from the list of **Available roles**.
5. Click the right arrow (→) to add your selection.
6. Assign a device license to the user.

License	Privilege
<b>None</b>	The user will have access to the Control Room only.
<b>Bot Creator- Development license</b>	Enables user to create and run bots. Auto login enabled by default.
<b>Unattended Bot Runner - Run-time license</b>	Users with this license can perform all automation tasks that attended users can perform. Additionally, this license can also be used for Control Room deployment, centralized scheduling, and API-based deployment.
<b>Attended Bot Runner - Run-time license</b>	Users with this license can run bots on their devices and use any event trigger associated with their user account or role. However, these users cannot schedule bots.
<b>Citizen Developer - Development license</b>	Users with this license can create and run bots (including bots with triggers) on their devices.

The **Bypass legal disclaimer** option is automatically enabled to allow the user to run bots on a device without having to manually acknowledge a disclaimer.

After you select a device license, the **Device login credentials** are enabled. If you have the **Attest device credentials** permission, you can choose to attest the device credentials for this user to bypass credential validation when you deploy bots. The Bot Runner user should have an unlocked and active user session.

**Note:** This works only if the auto login setting **Reuse an existing session** is selected in the Control Room by the administrator.

## 7. Click **Create user**.

Watch the following video on how to create a user in Automation 360:

### Create an Active Directory user

Add the Active Directory user by selecting the AD domain, providing AD environment details, and assigning a role and device license.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Administration > Users**.
2. In the **General Details** section, enter the following information:
  - a) **Enable User**: Select this option so that the user can log in immediately.
  - b) **Active Directory domain**: Select the active directory name for the user.  
The list displays all the domains that are available in the Active Directory domain controller.

---

**Note:** Control Room Active Directory supports single forest multi-domain environment.

---

- c) **Username**: Click **CHECK NAME IN ACTIVE DIRECTORY**.
  - If the user name is present in the Active Directory database, the **First name**, **Last name**, **Email**, and **Confirm email** fields are automatically populated.  
If the data is not automatically populated, enter the details in the fields.
  - If the username is not present in the Active Directory database, an error message is displayed. Contact the network administrator to resolve the issue.

If SMTP is enabled, the user is sent an email to this address to confirm the account. All important Control Room notifications will be sent to this email address. You can use the "@" character to accommodate email user names.

3. Select a Role from the list of **Available roles**.
4. Assign a device license to the user.

License	Privilege
<b>None</b>	The user will have access to the Control Room only.
<b>Bot Creator- Development license</b>	Enables user to create and run bots. Auto login enabled by default.
<b>Unattended Bot Runner - Run-time license</b>	Users with this license can perform all automation tasks that attended users can perform. Additionally, this license can also be used for Control Room deployment, centralized scheduling, and API-based deployment.
<b>Attended Bot Runner - Run-time license</b>	Users with this license can run bots on their devices and use any event trigger associated with their user account or role. However, these users cannot schedule bots.
<b>Citizen Developer - Development license</b>	Users with this license can create and run bots (including bots with triggers) on their devices.

The **Bypass legal disclaimer** option is automatically enabled to allow the user to run bots on a device without having to manually acknowledge a disclaimer.

After you select a device license, the **Device login credentials** are enabled. If you have the **Attest device credentials** permission, you can choose to attest the device credentials for this user to bypass credential validation when you deploy bots. The Bot Runner user should have an unlocked and active user session.

---

**Note:** This works only if the auto login setting **Reuse an existing session** is selected in the Control Room by the administrator.

---

5. Click **Create user**.

## Citizen Developer user

A Citizen Developer is a business user who can create and run bots, and share these automated tasks with peers. Citizen Developer is typically not a technical expert but a specialist such as a marketing analyst, HR manager, and accounts manager.

### Overview

Users with bot creation capability can create, edit, run, or schedule bots on their device. While users with bot execution capability can access a public folder to run or schedule published bots. Citizen Developer users combine these capabilities to create bots, access the public folder, and clone published bots and run them on their devices.

### Capabilities

In an organization, an administrator typically creates the Citizen Developer role with the necessary bot permissions and specifies the database or folder access. The administrator assigns this role to existing or new users and allocates the Citizen Developer license to them.

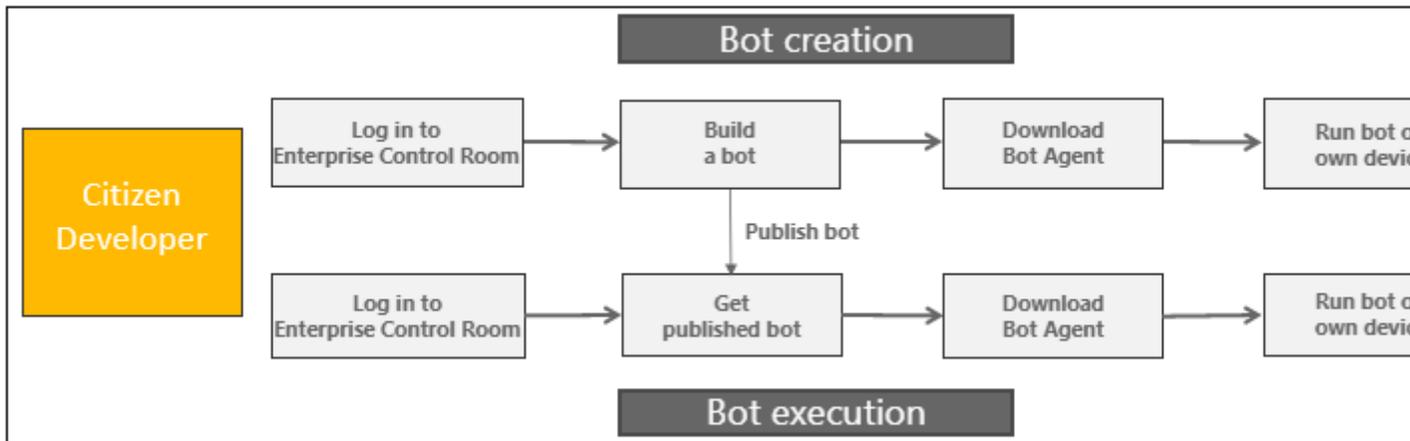
A Citizen Developer user can then perform the following tasks:

- Create bots and run them on their devices.
- Add and delete event triggers for bots on their devices.

Citizen developer user can create a private event trigger. However, the associated bot must be checked in to a public folder for other citizen developer or Bot Runner users to access that event trigger.

- Publish their bots to the public folder where other Citizen Developer users can access them.
- Access the public folder and clone published bots (including bots with triggers).
- Customize cloned bots and run them on their devices.
- Check in bots from their devices to the public folder.
- Check out bots from the public folder.

The following image illustrates the capabilities of a Citizen Developer user:



## Example

Consider a scenario where an organization has Marketing and Finance teams. The administrator creates the following two Citizen Developer roles:

- CD (Marketing): provides access to all Marketing team folders
- CD (Finance): provides access to all Finance team folders

The administrator then assigns the Citizen Developer license to users within each team. Citizen Developer users with the CD (Marketing) role can create and run bots on their devices. When a user with the CD (Marketing) role publishes a bot to a public folder, other Citizen Developer users within the Marketing team can clone and run this bot on their devices.

Similarly, Citizen Developer users with the CD (Finance) role will have the same capabilities within the Finance team folders. However, users from one team cannot access any folders and published bots from the other team.

### Related tasks

[Create a Citizen Developer user](#)

A Citizen Developer is a business user who can build and run bots on their devices, which then function as their digital assistants.

[Create a Citizen Developer role](#)

A Citizen Developer role enables the associated users to create and run bots on their registered devices.

[Adding event triggers](#)

Any bot with triggers can be associated with users or role to enable event trigger. Control Room user (or role) with **Manage event triggers** permission can add event triggers.

### Related reference

[Automation 360 licenses](#)

The All Licenses page displays detailed information about current product and device licenses.

## Create a Citizen Developer user

A Citizen Developer is a business user who can build and run bots on their devices, which then function as their digital assistants.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Administration > Users**.
2. Click **Create user**.

3. Enter the following user details:
  - a) Select the **Enable User** option if you want the user to be able to log in immediately.
  - b) Enter a unique user name.
  - c) Optional: Enter a description for the user.
  - d) Optional: Enter the first name and last name.

---

**Note:** The number of characters allowed for the first and last name is 50.

---

- e) Enter and confirm a password for the user.  
Ensure the password follows any necessary password policy.
  - f) Enter and confirm the email address for the user.  
If SMTP is enabled, the user is sent an email to this address to confirm the account. All Control Room notifications will be sent to this email address.
4. Select a Citizen Developer role from the list of **Available roles**.  
If there is no Citizen Developer role available, create one in Control Room.  
*Create a Citizen Developer role*
  5. Click the right arrow (→) to add your selection.
  6. Assign the Citizen Developer license to the user.  
The license enables users access to the Control Room only and enables them to create and run bots.  
The **Bypass legal disclaimer** option is automatically enabled to allow the user to run bots on a device without having to manually acknowledge a disclaimer.
  7. Click **Create user**.

## Reset user password

The Control Room administrator generates an email process for the user to reset their password.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

The change password email process.

1. Navigate to **Administration > Users**.
2. Select user from the list.
3. Click **Edit**.
4. Select **Send reset password email**.

---

**Note:** If there is no email server configured, follow these steps to reset the password for a user:

- a. Open the URL for the Control Room in your browser.
- b. Enter the user name, click **Forgot Password**, and follow the prompts to reset or change the password.
- c. Enter the user name, click the Forgot Password button, and follow the prompts to reset or change the password.

---

The selected user receives an email with the necessary instructions to reset the password.

## Related tasks

### [Log in to Automation Anywhere Control Room](#)

To log in to Automation 360, open the Control Room URL in your browser, enter your credentials in the login screen, and click **Log in**.

## Roles

The Control Room enforces role-based access control. There are two types of roles: system and user-created.

Role-based access control (RBAC) gives users access to specific features, based on the assigned roles and the accessibility provided to the user. The benefits of creating roles include:

- Increased security through controlling users access according to their specified roles.
- Decreased need of customer support.
- Easy and accurate monitoring of the use and access of data by higher management, leading to better research management.

### System roles

These roles are preconfigured with the permissions necessary to perform the tasks within the scope of that role. They cannot be modified or deleted.

#### *System roles*

### User-created roles

Users create these roles and the roles can be customized. If a user-created role is created with all Control Room permissions, it is not considered a Control Room Admin role. Only the system-created **AAE\_Admin** role has this privilege.

#### *Create and assign roles*

## Create and assign roles

Administrators configure roles with permissions to access features and perform operations such as create, edit, or delete a bot in the Control Room.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Assign specific permissions to each user. You cannot select users, if these users are deactivated by the Control Room administrator.

1. Navigate to **Administration > Roles**.
2. Click **Create role**.
3. Enter the **Name**.
4. Optional: Enter a description.
5. Select the feature permissions.

For more information about the available feature permissions by product, see [Feature permissions for a role](#).

6. Click **Next**.

7. Based on the option you select, perform the required action:

Option	Acion
<b>View my bots permission</b>	Select the bots permissions. <i>Bot permissions for a role</i>
<b>Run my bots permission</b>	Select the Bot Runner devices.

8. Click **Next**.  
 9. Select user from the list.  
 10. Click **Create role**.

### Related concepts

[Bot permissions for a role](#)

Assign bot permissions when creating a role with the **View my bots** feature permission.

### Related reference

[System roles](#)

System roles are preconfigured with the permissions necessary to perform the tasks within the scope of that role. They cannot be modified or deleted. Administrators assign the roles to users to enable them to access features and perform operations in the Control Room.

## Feature permissions for a role

A user with the **AAE\_Admin** role or a custom role with the **Manage roles** permission can create and assign roles to users to provide them with access to features and operations.

We recommend that you create individual roles with specific permissions. You can then assign the limited roles to users with that specific permission requirement.

## Automation Anywhere Robotic Interface (AARI)

Permission	Description
Cross Team Read	View all teams and see the team members
Cross Process Read	View all processes and see team members and managers
Team Management	Create and view teams, edit team names, descriptions, and process tags. Add new teams, team members, and assigned processes
Task Management	Submit and view tasks from processes that are assigned to the team
Case Management	Create and view requests from processes that are assigned to the team
Global Case Management	View process requests and tasks.  <b>Note:</b> This permission does not grant the capability to create a request or submit a task
Global Process Management	View checked-in public processes and assigned managers and teams, edit process tags, and assign managers and teams  <b>Note:</b> This permission does not grant the capability to create a process.
Global Team Management	View teams and assigned users, edit team names and descriptions. Add new processes, managers, and users to a team

Permission	Description
	<b>Note:</b> This permission does not grant the capability to create a team.

## API

Permission	Description
Bot Insight Data API	Allows access to Bot Insight RESTful APIs to the data logged by the Control Room and by a task during production runs.
Generate API-Key	Users can generate an <b>apiKey</b> that can be used in the Authentication API. <i>Authenticate with username and password API</i> <b>Note:</b> Users without the <code>generateapikey</code> permission can use APIs by authenticating using their username and password. <i>Authenticate with username and apiKey API</i>

## Activity

Permission	Description
View my In progress activity	Allows users to view their own activity. <b>Note:</b> All roles have this permission by default.
Manage my In progress activity	Allows users to pause, resume, or cancel their own activity and move their finished activities to history.
View everyone's In progress activity	Allows users to monitor ongoing automations where the user has either run or schedule access on the respective bot.
Manage everyone's In progress activity	Allows users to monitor and manage ongoing automations where the user has either run or schedule access on the respective bot. Users can also move the finished automations to history.
View my scheduled bots	Allows users to see their scheduled bots regardless of which user scheduled the bot.
Schedule my bots to run	Allows users to schedule their bots to run. In addition, users require permission to view and manage Bot Runners.
Edit my scheduled activity	Allows users to edit their scheduled bots, even if the bots are scheduled by a different user.
Delete my scheduled activity	Allows users to delete schedules for any of their bots regardless of which users scheduled the bot.
View and manage ALL scheduled activity from my Folders	Allows users to view, edit, and delete all the schedules on the bot folders to which that they have access. This includes the schedules that the user created or schedules created by other users.

Permission	Description
View and manage ALL scheduled activity	Allows users to view, edit, and delete all the schedules in the system. This includes the schedules that the user created or schedules created by other users.
Set automation priority to high	Allows users to set the automation priority to high to run and schedule bots. Automations with high priority are given preference over the medium and low priority automations so that you can run and schedule the high priority automations.

## Audit log

Permission	Description
View everyone's audit log actions	Allows users to view all audit log activity for the Control Room

## Bots

Permission	Description
View my bots	Allows users to view the bots they created and bots that were assigned to them. <hr/> <b>Note:</b> You must assign this permission before assigning any other bots permissions. <hr/>
Run my bots	Allows users to run the bots they created and bots that were assigned to them.
Export bots	Allows users to export bots and related bot dependencies for which they have download permission.
Import bots	Allows users to import bots and bot dependencies for which they have upload permission.
Create folders	Allows users to create folders within the folders that they have access to.
Rename folders	Allows users to rename the folders to which they have access. <hr/> <b>Note:</b> Only empty folders can be renamed. <hr/>
Cancel checkout	Allows users to cancel bot checkout and unlock the file from the public repository.

## Bot Store

Permission	Description
View Bot Store	Allows users to view Bot Store.
Add bots from Bot Store to My Bots	Allow users to add bot packages from Bot Store to their Control Room private workspace.

Permission	Description
Submit bots to Bot Store	Allow users to submit bot packages to Bot Store.

## Credentials and lockers

Permission	Description
Manage my credentials and lockers	<p>Allows users to create, edit, and delete their own credentials. In addition, the user can interact with credentials from their assigned lockers.</p> <hr/> <p><b>Note:</b> All roles have this permission by default.</p> <hr/>
Manage my lockers	Allows users to create and manage their own lockers.
Create standard attributes for a credential	Allows users to create a standard attribute for a credential that is shared across all users of that credential .
View and edit ALL credentials attributes value	Allows users to view and edit attributes that belong to other users.
Bot Auto-Login Credentials API	Allow users to automate the login process to run bots remotely.

**Note:** A user with the `AAE_Locker Admin` role can view all credentials and lockers in the Control Room. See [System roles](#).

## Dashboards

Permission	Description
View dashboards	<p>Allows users to view the dashboard.</p> <hr/> <p><b>Note:</b> All roles have this permission by default.</p> <hr/>

## Devices

Permission	Description
Register device	Allows users to register a local host device. <a href="#">Devices</a>
View and manage ALL devices	Allows users to view and manage all devices in the Control Room.
Attest device credentials	Allows users to attest device credentials for Bot Runner users. You can deploy bots on user devices with unlocked and active user session without a system password to bypass credential validation.

Permission	Description
	<b>Note:</b> This permission works only if the auto-login setting <b>Reuse an existing session</b> is selected in the Control Room by the administrator.
Delete devices	Allows users to delete devices that they registered.
Edit the devices	Allows users to edit the devices that they have permission to see.
View and manage myBot Creators, Bot Runners and device pools	Allows users to view and manage Bot Creators, Bot Runners, and device pools. <b>Note:</b> All roles have this permission by default.
Create device pools	Allows users to create and manage their own device pools.

**Note:** A user with the `AAE_Pool Admin` role can manage all device pools in the Control Room. See [System roles](#).

### Discovery Bot process

Permission	Description
View assigned process	Allows users to view assigned processes. <b>Note:</b> This is the standard permission. You must assign this permission before assigning any process discovery permissions.
View all processes	Allows users to view all the defined processes.
Edit process	Allows users to create and edit processes.

### Discovery Bot recording

Permission	Description
View all recordings	Allows users to view all recordings.
View own recording	Allows users to view their own recording. <b>Note:</b> You must assign this permission before assigning any of the following permissions.
Run recorder and create recording	Allows users to run the recorder and create recording.
Edit own recording	Allows users to edit their own recording.
Delete own recording	Allows users to delete their own recording.

## Discovery Bot aggregation

Permission	Description
View all aggregation	Allows users to view all aggregations.
View own aggregation	Allows users to view their own aggregations.  <b>Note:</b> You must assign this permission before assigning any of the permissions below.
Create or delete own aggregation	Allows users to create and delete aggregations.
Edit aggregation	Allows users to update aggregations.
View system generated aggregation	Allows users to view system aggregations.

## Discovery Bot opportunity

Permission	Description
View all opportunities	Allows users to view all opportunities.
View opportunity	Allows users to view opportunities within assigned process.  <b>Note:</b> You must assign this permission before assigning any of the permissions below.
Create or delete opportunity	Allows users to create and delete opportunities within the assigned process.
Convert to bot	Allows users to convert an opportunity to a bot.
Export opportunity	Allows users to export an opportunity.

## Event triggers

Permission	Description
View event triggers	Allows users to view event triggers.
Manage event triggers	Allows users to view and manage event triggers.  <b>Note:</b> You must assign the <code>view</code> permission before assigning this permission.

## IQ Bot

Permission	Description
View IQ Bot	Allows users to view the default dashboards in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any of the other IQ Bot permissions.

## IQ Bot administration permissions

Permission ID	Description
View Administration	Allows users to access the <b>Administration</b> tab in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any other administration permissions.
View and manage settings	Allows users to manage the IQ Bot portal advanced configuration settings.
View and manage migration	Allows users to access the migration utility to import and export learning instances in the IQ Bot portal.

## IQ Bot domains permissions

Permission	Description
View domains	Allows users to view all domains in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any other domain permissions.
Create domains	Allows users to create domains in the IQ Bot portal.
Import domains	Allows users to import domains in the IQ Bot portal.
Export domains	Allows users to export domains in the IQ Bot portal.

## IQ Bot learning instance permissions

Permission	Description
View learning instances	Allows users to view their learning instances in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any other learning instance permission.
View learning instances from the same role	Allows users to view learning instances created by other users with the same role in the IQ Bot portal.

Permission	Description
View ALL learning instances	Allows users to view all learning instances in the IQ Bot portal.
Launch validator	Allows users to access the IQ Bot Validator to review and update documents with exceptions.
Create learning instances	Allows users to create learning instances in the IQ Bot portal.
Edit learning instances	Allows users to edit learning instances in the IQ Bot portal.
Delete learning instances	Allows users to delete their learning instances in the IQ Bot portal.
Send learning instances to production	Allows users to send their learning instances to production in the IQ Bot portal.
Train learning instance groups	Allows users to train their learning instance groups in the IQ Bot portal.

### Package manager

Permission	Description
View packages	Allows users to view packages.
Manage packages	Allows users to view and manage packages.

### Licenses

Permission	Description
View licenses	Allows users to view the license details for the Control Room.
Manage user's device licenses	Allows users to assign device licenses to other users.
Install licenses	Allows users to install Automation 360 licenses for the Control Room.

### Migration

Permission	Description
View migration	Allows users to view new migrations, but not run them  <b>Note:</b> You must assign this permission before assigning the <code>manage</code> migration permission
Manage migration	Allows users to view and run new migrations
Allow a Bot Runner user to run migrations	Allows Bot Runner <b>Run-as</b> user to update the bot conversion status in the Control Room

## Settings

**Note:** Only a user with the `AAE_Admin` role has the capability to view and manage settings in the Control Room. See [System roles](#).

## Users and roles

Permission	Description
View users	Allows users to only view all other users in the system. They cannot create, edit, or delete users.  <b>Note:</b> You must assign this permission before assigning the <code>Create user</code> , <code>Update user</code> , or <code>Delete user</code> permission.
Delete users	Allows users to delete other users the Control Room.
Create users	Allows users to create new users in the Control Room.
Edit users	Allows users to edit all users in the system.
View roles	Users with this permission are able to view the roles in the Control Room.  <b>Note:</b> You must assign this permission before assigning the <code>Manage roles</code> permission.
Manage roles	Allows users to view and manage all roles in the Control Room.
View users and roles basic information	Allows users to view basic information on users and roles in the Control Room.

## Workload

Permission	Description
View and manage my queues	Allows users to view and manage their own schedules.
Create queues	Allows users to create and manage their own queues.
SLA Calculator	Allows users to calculate workload service-level agreements (SLA).

**Note:** A user with the `AAE_Queue Admin` role has all the workload permissions. In addition, the `AAE_Queue Admin` can manage all the queues in the Control Room. See [System roles](#).

## Bot permissions for a role

Assign bot permissions when creating a role with the **View my bots** feature permission.

Permission	Description
Select all	Enables users to check in, check out, view, delete, run, and schedule bots.

Permission	Description
Run/Schedule/Run and Schedule	<p>Enables users to run and schedule bots when the role has the <b>Run my bots</b> and <b>Schedule my bots to run</b> feature permissions.</p> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>This permission is limited to running bots when the role has only the <b>Run my bots</b> feature permission.</li> <li>This permission is limited to scheduling bots when the user has only the <b>Schedule my bots to run</b> feature permission.</li> </ul>
Check in	<p>Enables users to check in bot files or folders to the public workspace from their private workspace. When this permission is selected, the <b>Clone</b> and <b>View content</b> permissions are automatically enabled. These permissions can only be disabled by an user with the <b>AAE_Admin</b> role .</p>
Check out	<p>Enables users to check out bot files or folders from the public workspace. It creates an editable copy of the bot in the private workspace. A bot can be checked out by one user at a time. When this permission is selected, the <b>Clone</b> and <b>View content</b> permissions are automatically enabled. These permissions cannot be disabled.</p> <hr/> <p><b>Note:</b> To check out dependent folders and files, you must have the <b>Check out</b> permission on the dependency folders.</p>
View content	<p>Enables users to view the contents of a bot. This permission applies to both the public and private workspaces. To create a copy of the cloned bot or file in the private workspace, you must have the <b>View content</b> permission on the same folder in the public workspace.</p> <hr/> <p><b>Note:</b> You must have the <b>View content</b> permission enabled to export a bot and its dependencies.</p>
Clone	<p>Enables users to create a read-only copy of the bot from the public workspace to their private workspace. A bot can be cloned by multiple users. The <b>Clone</b> permission must be assigned at the folder level for the bot in the public workspace. To clone a dependency folder, you must have the <b>Clone</b> permission on the dependency folder.</p> <hr/> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>If you have cloned a bot and the corresponding public folder is deleted, then there will be no classifications on the cloned bot in your private workspace. Copy, view, or delete permissions will be available at the bot level.</li> <li>You cannot move or rename a cloned bot in your private workspace. You must have the <b>View content</b> permission on the same folder in the public workspace to view the contents of your cloned bot in the private workspace.</li> </ul>
Delete	<p>Enables users to remove files and their dependencies from the public workspace.</p>

**Related tasks**

[Create and assign roles](#)

Administrators configure roles with permissions to access features and perform operations such as create, edit, or delete a bot in the Control Room.

## Create a Citizen Developer role

A Citizen Developer role enables the associated users to create and run bots on their registered devices.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Although you can create a Citizen Developer role and assign additional custom bot permissions, ensure the role has all the feature permissions mentioned in this procedure.

1. Navigate to **Administration > Roles**.
2. Click **Create role**.
3. Enter the **Name**.
4. Optional: Enter a description.
5. Select the following feature permissions:

- Event triggers

Select the **View and manage my event triggers** option to allow the user to view, run trigger-based automation, or delete event triggers.

---

**Note:** The **View and Manage my event triggers** option is specific to the Citizen Developer license and can fail if it is assigned to users with Bot Creator or other licenses. Adding trigger events from the private repository is not supported.

---

- Bots

Select the **View my bots** option and the following permissions:

- **Run my bots**
- **Import bots**
- **Cancel checkout**

- Devices

Select the following permissions:

- **Register device**
- **View and manage ALL device(s)**
- **Edit the device(s)**

6. Click **Next**.
7. Click **Create role**.

A Citizen Developer role is created in the Control Room. You can create a Citizen Developer user and assign this role to that user.

[Create a Citizen Developer user](#)

## System roles

System roles are preconfigured with the permissions necessary to perform the tasks within the scope of that role. They cannot be modified or deleted. Administrators assign the roles to users to enable them to access features and perform operations in the Control Room.



## IQ Bot roles

Role	Permissions	
<p><b>AAE_IQ Bot Validator</b></p> <p>For a Bot Runner with an IQ Bot license. Permissions to access the IQ Bot Validator screen. Limited access to Control Room features.</p>	<p><b>Dashboard</b></p> <p><b>Activity</b></p> <p><b>Bots</b></p> <p><b>Devices</b></p> <p><b>Workload</b></p> <p><b>Audit Log</b></p> <p><b>Administration</b></p> <p><b>IQ Bot</b></p>	<p>View dashboards</p> <p>View my in-progress activity</p> <ul style="list-style-type: none"> <li>• Manage my credentials and lockers</li> <li>• Create standard attributes for a credential</li> </ul> <p>View and manage my Bot Runners, Bot Creators, and device pools</p> <p>View and manage my queues</p> <p>View all audit log actions</p> <p>View basic information about users and roles</p> <ul style="list-style-type: none"> <li>• View IQ Bot</li> <li>• View learning instances</li> <li>• Launch validator</li> </ul>
<p><b>AAE_IQ Bot Services</b></p> <p>Permissions to access the IQ Bot console. Limited access to Control Room features.</p>	<p><b>Dashboard</b></p> <p><b>Activity</b></p> <p><b>Bots</b></p> <p><b>Devices</b></p> <p><b>Workload</b></p> <p><b>Audit Log</b></p> <p><b>Administration</b></p> <p><b>IQ Bot</b></p>	<p>View dashboards</p> <p>View my in-progress activity</p> <ul style="list-style-type: none"> <li>• Manage my credentials and lockers</li> <li>• Create standard attributes for a credential</li> </ul> <p>View and manage my Bot Runners, Bot Creators, and device pools</p> <p>View and manage my queues</p> <p>View all audit log actions</p> <p>View basic information about users and roles</p> <ul style="list-style-type: none"> <li>• View IO Bot</li> </ul>

## Bot Insight roles

See [Roles to access Bot Insight](#).

## Discovery Bot roles

Role	Permissions	
<p><b>AAE_Discovery Bot Admin</b></p> <p>Allows access to view all Discovery Bot processes. Manages the creation, deletion, and editing of processes.</p>	<p><b>Dashboard</b></p> <p><b>Activity</b></p> <p><b>Bots</b></p> <p><b>Devices</b></p> <p><b>Workload</b></p> <p><b>Administration</b></p> <p><b>Discovery Bot</b></p>	<p>View dashboards</p> <p>View my in-progress activity</p> <p>Manage my credentials and lockers</p> <p>View and manage my Bot Runners, Bot Creators, and device pools</p> <p>View and manage my queues</p> <p>View information about users and roles</p> <ul style="list-style-type: none"> <li>• View all processes</li> <li>• Edit process</li> </ul>
<p><b>AAE_Discovery Bot Analyst</b></p> <p>Allows access to view and edit all approved recordings from assigned users for a given process. Permissions for system-generated aggregated view of recordings to view, create, edit, and delete views. Permissions to create, view, edit, and delete opportunities for assigned processes. Export the opportunity to a word document and convert to a bot.</p>	<p><b>Dashboard</b></p> <p><b>Activity</b></p> <p><b>Bots</b></p> <p><b>Devices</b></p> <p><b>Workload</b></p> <p><b>Administration</b></p> <p><b>Discovery Bot</b></p>	<p>View dashboards</p> <p>View my in-progress activity</p> <p>Manage my credentials and lockers</p> <p>View and manage my Bot Runners, Bot Creators, and device pools</p> <p>View and manage my queues</p> <p>View basic information about users and roles</p> <ul style="list-style-type: none"> <li>• View assigned processes</li> <li>• View all recordings</li> <li>• View all aggregation</li> <li>• View own aggregation</li> <li>• Create or delete own aggregation</li> <li>• Edit aggregation</li> <li>• View system-generated aggregation</li> <li>• View opportunity</li> <li>• Create or delete opportunity</li> </ul>

## Automation Anywhere Robotic Interface roles

Role	Permissions	
<b>AAE_Robotic Interface Admin</b>	<b>Dashboard</b>	View dashboards
	<b>Activity</b>	View my in-progress activity
	<b>Bots</b>	Manage my credentials and lockers
	<b>Devices</b>	View and manage my Bot Runners, Bot Creators, and device pools
	<b>Workload</b>	View and manage my queues
	<b>Administration</b>	<ul style="list-style-type: none"> <li>View and edit users</li> <li>View basic information about users and roles</li> </ul>
	<b>AARI</b>	<ul style="list-style-type: none"> <li>Cross team read</li> <li>Cross process read</li> <li>Global case management</li> <li>Global process management</li> <li>Global team management</li> </ul>
<b>AAE_Robotic Interface Manager</b>	<b>Dashboard</b>	View dashboards
	<b>Activity</b>	View my in-progress activity
	<b>Bots</b>	Manage my credentials and lockers
	<b>Devices</b>	View and manage my Bot Runners, Bot Creators, and device pools
	<b>Workload</b>	View and manage my queues
	<b>Administration</b>	<ul style="list-style-type: none"> <li>View and edit users</li> <li>View basic information about users and roles</li> </ul>
	<b>AARI</b>	<ul style="list-style-type: none"> <li>Team management</li> <li>Case management</li> <li>Task management</li> </ul>

## Active Directory role mapping

The role mappings feature maps Active Directory (AD) security groups to one or multiple roles in the Control Room.

Role to AD mapping enables the Control Room to synchronize with the AD, assign roles to users, and enable user access to objects such as bots, devices, folders, credentials, and Credential Vault lockers.

If you have Active Directory security groups, map these security groups to roles through the Control Room. When users are created, they automatically inherit the roles assigned to their AD security groups. Security group role assignments to users are updated with every Control Room to Active Directory sync.

### User creation

All the security groups that a user belongs to in the AD are retrieved and roles are automatically assigned to that user based on the mappings.

### User login

Every time a user logs in, the Control Room validates the mappings, the current security group memberships, and assigned roles before confirming any required changes.

### Automated background process

This process is initiated based on the defined time period set on the **Active Directory role mappings** page. The process synchronizes all the mappings before synchronizing roles for every user in the Control Room based on the updated mappings.

All the roles assigned through role mappings are designated as system-assigned roles. The Control Room admin can assign additional roles to users if required. However, the system-assigned roles of the users cannot be removed.

---

**Note:** The system-assigned roles can be changed or removed only from mappings.

---

## Nested mapping currently not supported

For example, assume that an AD has a parent group called `pGroup` and a child group called `cGroup`. The user `Paul` is part of the `pGroup`. In the Control Room, a mapping is created to map `pGroup` to `Role1` and `Role2`. Another mapping is created to map `cGroup` to `Role3`.

Only direct mapping is supported in the Control Room, so `Paul` is automatically mapped to only `Role1` and `Role2`, and not `Role3`.

## Create Active Directory role mapping

When users are created, they automatically inherit the roles assigned to their Active Directory security groups. Create the mapping before synchronizing the user and roles during the user login or background process.

To complete the task, you must have **AAE\_Admin** role assigned to you. Ensure you are logged in to the Control Room as the administrator.

Map a single AD security group to one or more Control Room roles. Create any roles you want to use with the Active Directory security groups. You can also use the default roles available in the Control Room. .

While there is a nested grouping relationship in the AD, there is no such relationship in the Control Room because they are all one-to-one mappings.

1. Log in to the Control Room.
2. Navigate to **Administration > Roles**.
3. Click **Active Directory Role Mapping**.
4. Click **Create Role Mapping**.
5. Enter the **Name**.
6. Click the **Active Directory domain** drop-down and select an available domain.
7. Use the **Active Directory security group** field to search for a group.  
For example, if you have a group named `Certified Publishers`, search for `Certified`. All the groups that contain `Certified` in their name are listed in **GROUPS**.
8. Click the right arrow (→) to add your selection.
9. Select a Role from the list of **Available roles**.
10. Click the right arrow (→) to add your selection.
11. Click **Create Mappings**.

When the LDAP sync runs, all users with the assigned roles are updated.

## Edit Active Directory role mapping

As an Automation Anywhere Control Room administrator, edit the Active Directory security group mappings assigned to roles in the Control Room.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Ensure that the mapping name is unique and cannot be duplicated. If you rename a map with an existing mapping name, an error message appears stating that the same name already exists. Changes to mapping name or roles are updated in the audit log.

1. Navigate to **Administration > Roles**.
2. Click **Active Directory Role Mapping**.
3. Hover over the **Actions** icon for the role and select **Edit role mapping**.
4. Supply any required changes for Role Mapping.

Edit the roles by either adding or removing roles from the **Available roles** list, except Bot Insight roles. If you assign Bot Insight roles, an error message appears stating that the role mapping cannot be updated as it contains unsupported roles.

---

**Note:** The rest of the fields cannot be edited.

---

5. Click **Save changes**.

When the LDAP sync runs, all users with the assigned roles are updated.

## Sync Active Directory role mapping

Manually or automatically synchronize (sync) role mappings between the Active Directory and Control Room.

## Automatically synchronize Active Directory role mapping

By default, synchronizing between Active Directory and Control Room occurs after every time to live (TTL) interval. Edit the `um.properties` file to change the TTL interval for cronjobs.

### Run LDAP auto discovery for AD

---

**Recommendation:** As this can be a time-consuming and an expensive operation, set the role synchronization time period to the default value of 1440 minutes (1 day).

---

### Manually run or restart synchronizing Active Directory role mapping

To run or restart automatic synchronizing between the Active Directory and Control Room, do this: From the Control Room go to the **Active Directory role mappings** page and click the **Sync roles from Active Directory** option.

This starts the synchronizing process immediately and continues to run it automatically based on the time interval set.

### Cancel automatic synchronizing Active Directory role mapping

To cancel automatic synchronizing between Active Directory and Control Room, do this: From the Control Room go to the **Active Directory role mappings** page and click the **Cancel Sync** option to turn off the periodic automatic sync.

### Events that require Active Directory role mapping sync

Sync the role mappings whenever these events occur:

- Changes to AD groups

If any group that is mapped is deleted from the AD, the mappings must be validated before they are deleted because the group is no longer available.

- Update to the license file

Updating the license file can change the available roles. Mappings must be synchronized before updating the roles.

---

**Note:** After a sync, the user must wait a few seconds for the updated changes to appear.

---

### Manage Active Directory role mapping

An administrator or a user with permission to view and manage roles can view the details of the available Active Directory role mappings.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

You must have the manage roles, create user, and edit user permissions to perform this task.

To create role mappings with filters for the `Users` directory along with other organizational units (OU), you must update the `um.properties` file. In the Control Room, the `Users` directory is considered similar to the OUs. Therefore, you must define the filter in the `um.properties` file.

For example, set the filter in the file as follows:

```
um.ldap.groupmapping.domain.filter='mydomain.com:OU1&groupFilter|
OU2&groupFilter|Users&groupFilter'
```

This setting ensures that the users from the organization units OU1 and OU2 will be retrieved in addition to the `Users` directory.

1. Navigate to **Administration > Roles**.
2. Click **Create Role Mapping**.
3. Enter an available mapping name in the search box next to the **Mapping Name** drop-down list. Optionally, you can use the **Active Directory security groups** to search for any available AD security groups.
4. Hover over the **Actions** icon for the role and select **View role mapping**.

One or more available role mappings that match your search criteria appear in the **Role Mapping** table.

## Delete Active Directory role mapping

An administrator or a user with permission to view and manage role can delete role mappings listed in the Role Mapping table.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Administration > Roles**.
2. Click **Active Directory Role Mapping**.
3. Hover over the **Actions** icon for the role and select **Delete role mapping**.
4. Click **Yes, delete**.

## Settings

Use the **Settings** tab to configure the connection to the Credential Vault, enable email notifications, integrate the Control Room with a Git repository, enable secure recording mode, and configure user authentication.

### Bots

Secure recording mode ensures that sensitive data is not stored in the bots. When secure recording mode is enabled, the bots do not capture values of certain properties or store application images. This setting applies to all the users of the Control Room.

---

**Note:** Secure recording mode only applies to bots that are created or edited after the mode is enabled.

---

Click **Edit** in the **Bots** tab to enable or disable secure recording mode.

### Devices

When there is a new version of the Bot agent, all Bot agents are automatically updated.

### IQ Bot

View the website address where IQ Bot is currently installed, if applicable. Click **Edit** to update the IQ Bot URL.

## Email

All users have to confirm email accounts by clicking the confirmation link that they receive, set the password, and security questions before user can log in to the Automation Anywhere Control Room. By default, email notifications are disabled. Mouse over the **Edit** icon to make changes.

[Edit email notifications](#)

## Git integration

Remote Git repository must support Git LFS (Large File Support). BotsBots are synced using standard Git push over HTTPS.

## User authentication

Configure the *Control Room* to authenticate users through the database option or switch to a SAML identity provider (IDP).

[Set up SAML authentication](#)

## Network settings

Ensures that access to the Cloud Control Room URL is not allowed from outside a specified list of designated IP addresses.

## Configuration settings

### Related tasks

[Set up SAML authentication](#)

Switch an authenticated environment Control Room database to a SAML identity provider (IDP).

[Edit email notifications](#)

Edit details about the email server to use for dispatching email notifications.

## Configure default device settings

Configure the device settings to automatically set a user's current device as the default device after the user logs in to the Control Room.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Configure the default device setting for temporary or non-persistent devices so that such device users do not have to log in to the Control Room to mark their device as a temporary device.

1. Navigate to **Administration > Settings > Devices**.
2. Edit the **General** settings.
3. To automatically set a logged-in user's device as the default device, verify that the **Enabled** option is selected.

The option is selected by default. You can change it to **Disabled** if you do not want to set a logged-in user's device as the default device.

4. Save the settings.

## Switch device registration between Control Room instances

Configure the device settings in the Control Room to enable single-user devices to use different instances of the Control Room. This option enables you to register the Bot agent on multiple Control Room instances and switch to another instance without reinstalling the Bot agent.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

You must have the View and Manage ALL device permission to enable the switching option.

Switching is allowed only between two Control Room on the same release version. For example, you can switch between two Control Room if the release version for both is Build 8815.

You must enable the switching option on both Control Room instances.

1. Navigate to **Administration > Settings > Devices**.
2. **Edit** the **General** settings.
3. To configure a single-user device to use different instances of the Control Room, select **Enabled**.
4. Save the settings.

### Related tasks

[Switch Bot agent to a different Control Room](#)

Switch the Bot agent on a registered device to work with a different Control Room manually when you work on automations using different environments.

## Configure package settings

Configure the Control Room settings to automatically download the most frequently used packages in the automation on the Bot agent when the device user logs in. You can save time to execute the automation because the most frequently used packages are available on your device.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Enable or disable the **Packages** configuration in the Control Room.

1. Navigate to **Administration > Settings > Devices**.
2. Edit the **Packages** option.
3. Select **Enable** to automatically download packages on the user devices from the Control Room.
4. Save the settings.

### Related tasks

[Preload packages](#)

You can preload packages on your local device to shorten the bot runtime.

## Change screen resolution for Bot Runner session

For multi-user devices, you can set the screen resolution of the Bot Runners for every bot deployment through the RDP in the Control Room.

This task is performed by the user who wants to build and deploy . You must have the necessary rights and permissions to complete this task, and authorization to log in to the as the licensed user.

The RDP session is created using the set screen resolution during bot deployment.

1. Navigate to **Administration > Settings > Devices**.
2. Edit the **Resolution settings for a device session** field.
3. Set the resolution by either selecting a predefined value from the **Screen resolution** drop-down list or by selecting **Custom** and entering the values you want.
4. Select the **Do not allow devices to override resolution settings** option.
5. Click **Save**.

## Configure auto-delete temporary device settings

Configure your device settings to automatically delete a temporary device when the device is disconnected from the Control Room after a certain time interval.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Administration > Settings > Devices**.
2. Edit the **Temporary devices - auto delete settings**.
3. Use plus (+) or minus (-) to select the number of **Days, Hours, or Minutes** to wait before the temporary device should be deleted automatically.  
The default time is 24 hours.  
You can also manually delete the temporary device from the **My devices** page in the Control Room.
4. Save the settings.

## Configure threshold settings for user devices

Configure the CPU utilization and device memory threshold values to control the concurrent bot deployment on user devices based on resource utilization.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Based on the CPU utilization and device memory threshold values, you can determine whether to deploy bots on user devices. If the threshold value is the same or more than the value provided, bots are not deployed on user devices.

The default values for CPU utilization and device memory are based on the following parameters:

- When the frequency of data collection is 10 seconds, the system collects 6 data points in 1 minute.
- When time interval to upload data is 120 seconds, the system uploads 6 data points to the Control Room every 2 minutes.
- When the moving average time window is 2 minutes, the system uses the last 12 data points to calculate the average resource utilization.

1. Navigate to **Administration > Settings > Devices**.
2. Edit **Threshold settings for multi-user devices**.

### 3. Optimize the behavior for concurrent sessions by choosing one of the following options:

- Do not enable threshold settings  
Use this option to deploy bots on single-user devices.
- Enable threshold settings to set the maximum values:
  - a. Enter the CPU and memory utilization frequency of data collection.
  - b. Enter the time interval to upload data.
  - c. Enter the moving average time window.
  - d. Enter the CPU threshold limit for new bot deployments on a device.
  - e. Enter the memory threshold limit for new bot deployments on a device.

Use this option to deploy on multi-user devices.

You can either enter the values or click the plus (+) or minus (-) signs to increase or decrease the limit.

### 4. Save the settings.

## Configure auto-login settings

Configure auto-login settings in the Control Room to either create user sessions or reuse existing user sessions to reduce the bot startup time.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Auto-login enables you to deploy a bot for unattended Bot Runners after automatically logging on to a machine and restoring the machine to its original locked/unlocked state after completing the deployment.

Configure auto-login settings to either create new user sessions or reuse existing sessions in the following scenarios:

- Before deploying a bot, some applications are kept running to accommodate a delay in the application launch.
- When Windows updates or Active Directory policy updates are pushed after a user logs in, changes in the automation environment might affect bot execution.
- Logging off from temporary or non-persistent devices stops bot execution.
- You can reuse existing user sessions when your company's IT policy prevents you from providing device user password for auto-login credentials.
- To bypass legal disclaimers on RDP-based deployments.

#### 1. Navigate to **Administration > Settings > Devices**.

#### 2. Edit the **Auto login settings**.

#### 3. Optional: External key vault setting.

If an external key vault is used, and you want to retrieve Auto-login passwords from the external vault, click **Enabled**. If using AWS, you will only need to click **Enabled**. If using CyberArk, you will need to provide the Safe Name in CyberArk that contains the Auto-login credentials.

4. Choose how to run bots on user sessions by selecting one of the following options:

- **Always create a new session**

Select this option for desktop deployments where it is possible to create user sessions on devices.

- **Reuse an existing session**

---

**Recommendation:** Select this option for auto-login settings in the Control Room to use event triggers on unattended Bot Runners and to run bots when a device is locked or is in a disconnected state (such as RDP).

---

Available options to lock or unlock the session are:

- An existing locked session
- An existing unlocked session
- A disconnected session
- Allow users to change these settings for each device

Use this option for deployments on devices where it is not possible to create user sessions.

---

**Note:** When you use the **Reuse an existing session** option, ensure user sessions are available. If there is no existing user session, triggers and bot deployments will fail.

---

- **Reuse an existing session, if available**

Use this option if you must create a new session or reuse an existing session. If a session does not exist, create a new session and leave it unlocked for next user session after bots complete their run from the following:

- A new session
- An existing locked session
- An existing unlocked session
- A disconnected session

5. To allow a user to change the auto-login settings at the device level, go to **Administration > My Devices** and select **Allow changes**.

The **Do not allow changes** option disables the user-level auto-login settings for user sessions.

6. Save the settings.

### Related reference

#### [Devices](#)

The device is a machine through which a user connects to the Control Room to create or run bots. Manage devices that are registered to the Control Room through the **Devices** page located in the **Manage** tab.

## Network access

Ensures that access to the Cloud Control Room URL is not allowed from outside a specified list of designated IP addresses.

System administrators can restrict the access to the Cloud Control Room URL from only those IP addresses within the corporate network for more granular security. The Automation Anywhere Control Room provides the ability to specify a list of IP addresses or IP subnets that are allowed for Cloud Control Room URL and API access. Therefore, the Control Room and Bot agent device IP addresses or subnets added to the list are allowed access to the Cloud Control Room URL. Automation 360 users with Control Room administrator privileges, such as to access **Administration > Settings**, can view, add, or edit this list.

---

**Note:** There is a limit of 25 independent entries in the access permitted table. An entry can be a single IP address or an IP subnet.

---

### Related tasks

#### [Add access IP addresses](#)

Add addresses one at a time, or as a range of addresses to limit the network access of other Control Room and Bot agent users to the Control Room URL.

## Add access IP addresses

Add addresses one at a time, or as a range of addresses to limit the network access of other Control Room and Bot agent users to the Control Room URL.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

The Automation Anywhere Control Room provides the ability to specify a list of IP addresses or IP subnets that are allowed for Cloud Control Room URL and API access.

---

**Note:** When using SAML for authentication, use the network access capabilities of the Identify provider to restrict access to specific allowed IP addresses.

---

Perform the following steps to add an IP address (or IP subnet) to the list of permitted network access addresses:

1. Log in to the as the administrator.
2. Navigate to **Administration > Settings > Network settings**.
3. Click **Edit** to add to or edit the IP addresses listed.

---

**Note:** There is a limit of 25 independent entries in the access permitted table. An entry can be a single IP address or an IP subnet.

---

4. Enter the IP address information:

Option	Description
<b>Single IP address</b>	Enter the necessary IP address in x.x.x.x format.
<b>Range of IP addresses</b>	Enter the address in x.x.x.x format and specify the subnet mask.

5. Enter the **Name**.
6. Optional: Enter a description.
7. Click **Save changes**.

## Set up SAML authentication

Switch an authenticated environment Control Room database to a SAML identity provider (IDP).

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

---

**Note:** The SAML IDP side setup must be validated before configuring the Control Room. See [Configure the Control Room as a service provider](#).

---

To switch the Control Room to a SAML-authenticated environment, follow these steps:

1. Navigate to **Administration > Settings > User authentication**.

2. Click **Edit**.
3. Select the **Use SAML** option.

---

**Note:** The **Use Control Room database** option is selected by default.

---

4. In the **SAML metadata** field, enter the data from your SAML IDP setup.

```
<saml2:AuthnStatement
  AuthnInstant="authenticated_instance" SessionIndex="index_value_required">
```

5. In the **Unique Entity ID for Control Room (Service Provider)** field, enter the entity ID.
6. In the **Encrypt SAML Assertions** field, select one of the following options:

Option	Description
<b>Do not encrypt</b>	SAML assertions are not encrypted.
<b>Encrypt</b>	SAML assertions are encrypted.

7. Optional: Enter the **Public key** and **Private key** values.

---

**Note:** Enter keys only if you require encrypted SAML assertions.

---

8. Click **Validate SAML Settings**.

You are required to validate your SAML 2.0 settings before saving your changes.

When you click this option, you will be redirected to a SAML 2.0 service provider web page where you will be prompted to enter credentials and other data.

9. Enter a different username.

After validation is complete, you will be redirected back to this configuration page.

If the username already exists, an error appears.

10. Click **Save changes**.

Configure SAML on the local active directory.

#### **Related tasks**

[Configure the Control Room as a service provider](#)

## Configure Credential Vault Connection mode

Credential Vault is a centralized location for securely storing credential information used by bots.

Configure the **Connection mode** to connect to the Credential Vault using a **Master key**.

---

**Note:** Provide this key every time you start or restart the Control Room.

---

To configure settings for Credential Vault, select **Express** or **Manual** mode.

#### **Express mode**

Auto connect to the Credential Vault with the master key that is stored in the system during Control Room configuration.

#### **Manual mode**

Use this to manually connect to the Credential Vault using the master key that was available during Control Room configuration.

When switching modes, provide the **Master Key** in the field and click **Save** for the changes to take effect.

**Tip:** Restart the server machine (on which the Control Room is installed) or services to allow changes to take effect.

All updates to the Credential Vault **Connection mode** are captured in the **Audit Log**.

If you are facing Credential Vault connection issues while accessing the Control Room URL, see [CR fails to load with the Error Code 'cv.validation.secure.cv.locked' \(A-People login required\)](#).

### Related tasks

#### [Set up locker and assign credentials](#)

Create a role, credentials, and locker to share related sensitive values with a group of users, so they can use those values to build or run bots.

## Edit external key vault configuration

Edit the access to an external key vault.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

This page is Cloud only and not applicable to On-Premises deployments. External key vault settings in an On-Premises deployment are only configurable during installation or with the utility post installation.

Enter configuration settings to connect to an external key vault.

1. Navigate to **Administration > Settings > External key vault**.
2. Click **Edit**.
3. Select external key vault:

External key vault	Authentication settings
<b>AWS Secrets Manager</b>	Enter the <b>Region</b> , <b>AWS Key</b> , and <b>Secret Key</b> for the AWS Secrets Manager.
<b>CyberArk</b>	Enter the <b>CyberArk endpoint URL</b> , <b>application ID</b> , and <b>certificate trusted by the CyberArk CCP endpoint</b> .

4. Click **Save changes**.

## Edit email notifications

Edit details about the email server to use for dispatching email notifications.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Specify details about the email server you want to use and the events when the email notification must be sent. To configure **Email** settings, perform these steps:

1. Navigate to **Administration > Settings > Email**.
2. Click **Edit**.
3. Select **Send email notifications**.

By default, the email notifications are disabled.

## 4. Specify the details of the server that you want to use to send email notifications.

Option	Description
<b>From this email address</b>	Enter the email address that you want to use to send email notifications.
<b>Email server host</b>	Specify the email server that you want to use to send email notifications.
<b>Email server port</b>	Specify the email port that you want to use to send email notifications.
<b>My server uses a secure connection (SSL/TLS)</b>	Select the option if the server uses a secured connection.
<b>My server requires authentication</b>	Select the option if the server requires credentials for access, such as for an external credential vault.
<b>Specify the Username and Password you want to use to access the server.</b>	Specify the credentials.

**Important:** The options to specify or modify the email server details are available only for the On-Premises deployment.

## 5. Select any or all of the following option to specify the events when an email notification must be sent:

- **User initiates Forgot Password process from Login screen**
- **User information changes, to the user**
- **A user is activated, deactivated or deleted, to the user**
- **A Task Bot stops running because it is unsuccessful, to the user who started or scheduled it**
- **A BLM package is exported or imported, to the user who performed BLM export or import**

6. Click **Save changes**.

## Integrating Control Room with Git repositories

Git integration with the Control Room ensures one-to-one mapping of the bots checked in to the public workspace of the Control Room and the remote Git file structure. Git commits enable you to enforce security, compliance, and code standards, and ensures that an organization's established best practices can be applied to their bot development processes.

The Control Room has Git Client that is connected to the Git repository that stores the file history of your public workspace. Each time a bot developer performs a bot check-in:

- The bot and the dependent files are checked in to the public workspace.
- The Control Room creates a commit that contains all the contents of the particular check-in within the Git repository.
- The comment entered in the check-in process is used as the Git commit message and the user details are recorded as the author of the Git commit.
- The Bot definitions are stored as JSON files in the Git repository.

---

**Note:** The Git repository must be configured to have write access only to the Control Room and not to any other Git client.

---

## Supported Git repositories

You can configure the Control Room to replicate the built-in Git repository with the remote Git host, and synchronize information using Git push. The following sources are certified for Git integration with the Control Room.

- GitHub
- BitBucket

Configure HTTPS (username and password authentication) between the Control Room and the remote Git host. The Control Room and remote Git host use standard Git push protocol over HTTPS to send or receive data.

Exposing the files to your remote Git host enables you to review the bot code and files using third-party comparisons and static code analysis tools to help enforce compliance and maintain security standards.

## Configure a remote Git repository in Control Room

Configure a remote Git repository in the Control Room so that all the bot information that is stored in the Microsoft SQL Server is synchronized with the remote Git host. When you check in a bot, the local Git repository pushes the bot and its dependent files to the remote Git repository.

- In order to configure a remote Git repository in the Control Room, ensure that you have the `AAE_Admin` role.

---

**Note:** The Git repository must be configured to have write access only to the Control Room and not to any other Git client.

---

- Based on your region, configure your network firewall to add outbound NAT gateway IP addresses to the allowed list.

*[NAT IP addresses for Git integration](#)*

---

**Note:** The Git repository must be configured to have write access only to the Control Room and not to any other Git client.

---

1. In the Control Room, navigate to **Administration > Settings > Git Integration**.
2. In the **Git Integration** window, select **Set up Git Integration**.
3. In the **Credentials** menu, perform these steps:

- a) Enter your Git repository path in the **User Name** field in the following format:

```
https://<username>@github.com/.../....git
```

---

**Note:** Use the Git host that you want to obtain the Git repository address.

---

- b) Enter your Git repository password or a Git token, generated using your Git client.
  - c) Enter the same password or the Git token to confirm.
  - d) Click **Submit**.
4. Click **Connect and Save**.  
The Control Room connects to the remote Git repository.

## Remove Git integration configuration

If there is no longer a need to synchronize the bot information stored in your Control Room with the remote Git host, you can remove or disable it.

Ensure that you have the `AAE_Admin` role assigned to you.

1. Navigate to **Administrators > Settings > Git Integration**.
2. In the **Git Integration** window, click **Edit**.
3. Select **Do not set up Git integration**.
4. Click **Connect and Save**.

This setting removes the remote Git configuration, and the Control Room will no longer push the Git history to the remote Git host.

## NAT IP addresses for Git integration

To ensure seamless connectivity of your Git instance with the Cloud Control Room, configure your network firewall to include Automation Anywhere outbound NAT gateway IP addresses to the allowed list.

Based on your region, add the following outbound NAT gateway IP addresses to the allowed list:

Region	NAT IP addresses
Asia-Pacific Australia	<ul style="list-style-type: none"> <li>• 54.153.153.175</li> <li>• 52.65.8.56</li> <li>• 3.106.147.142</li> </ul>
Asia-Pacific North East	<ul style="list-style-type: none"> <li>• 18.177.157.130</li> <li>• 18.176.174.19</li> <li>• 3.114.196.205</li> </ul>
European Union	<ul style="list-style-type: none"> <li>• 108.128.188.103</li> <li>• 63.34.200.237</li> <li>• 52.30.160.238</li> </ul>
India	<ul style="list-style-type: none"> <li>• 3.7.60.137</li> <li>• 3.6.235.61</li> <li>• 13.232.116.48</li> </ul>
Latin America	<ul style="list-style-type: none"> <li>• 54.94.241.48</li> <li>• 18.229.39.93</li> <li>• 52.67.153.170</li> </ul>
Middle East	<ul style="list-style-type: none"> <li>• 15.185.153.52</li> <li>• 15.185.181.122</li> <li>• 157.175.32.98</li> </ul>

Region	NAT IP addresses
Singapore	<ul style="list-style-type: none"> <li>• 18.141.71.43</li> <li>• 54.251.139.55</li> <li>• 18.136.253.184</li> </ul>
US East	<ul style="list-style-type: none"> <li>• 50.16.245.134</li> <li>• 35.174.84.76</li> <li>• 3.210.114.16</li> </ul>
US West	<ul style="list-style-type: none"> <li>• 54.213.119.159</li> <li>• 34.218.159.79</li> <li>• 52.33.16.117</li> </ul>

## Restore bots from Git repository

If your database is deleted or corrupted, you can restore all your bots and the associated dependent files from the Git repository to your new database.

Ensure the following before you restore your bots from Git:

- You must have a backup of the bots on Git.
  - You must have the **AAE\_Admin** role assigned.
  - The Git restore process requires some downtime. When the restore process is running, the following public workspace operations are disabled:
    - Check-out
    - Clone
    - Run and schedule bots
    - Run bots with queue
    - Import and export bots
  - When the restore process is running, the check-in operation is not allowed from the private workspace. However, you can use the private workspace for the rest of the operations.
  - You can restore your bots to your empty or non-empty repository.
  - You cannot abort an ongoing restore process.
1. Log in to the Control Room as an admin user.
  2. Navigate to the **Bots > My Bots > Public** workspace.
  3. Click the **Restore from Git** option.  
The **Restore from Git** dialog box appears, displaying a warning that all the public repository operations will be disabled during the Git restore process.
  4. If you have duplicate files in the Git repository, select to either **Overwrite the existing files** or **Skip the existing files** in the Git repository.

5. Based on whether the repository is empty or non-empty, choose one of the following options:
- To restore files to a repository that is not fully empty, enter your Git credentials for the associated repository.
  - To restore files to a fully empty repository, you can choose the Git repository from which you want to restore your files.
    - Use existing Git configuration settings:** Select this option to restore your data from the Git repository configured with the Control Room.

---

**Note:** Ensure you connect your Control Room to the remote Git repository from **Administration > Settings > Git integration**.

---

- Use any other repository:** Select this option to restore data from any other repository. Enter the repository path and token or password of the associated Git repository.

6. Click **Continue** to proceed with the restore process.

The system starts restoring the bots and the dependent files from Git. This process takes some time. After the restore process is completed successfully, you are automatically returned to the **My bots** page. The bots and the dependent files are restored in your new database, maintaining the original structure of the dependent files.

If the Git restore process fails after restoring some bots, you are redirected to the public workspace with the following options. Choose the required option to complete the restore process:

Option	Action
<b>Revert restoration bots</b>	This option clears all the bots that were restored. <hr/> <b>Note:</b> This option will delete the public bots that were restored from the Git repository. <hr/>
<b>Restart restoration</b>	The Git restore process restarts from where it ended.
<b>Keep only the restored files</b>	This option retains whatever files were restored and will exit the restore process.

## Usage statistics

Automation Anywhere collects usage statistics from Automation 360 for product improvements.

Usage statistics provides information on where users might be facing issues with the product, the most used or least used features, and so on. This information helps in product improvement which in turn helps in improving the customer experience.

By default, the **Usage statistics** option is enabled in the Control Room and usage data is collected. The data collected is stored in Automation 360 and the service provider cloud. The collected data is typically generic information such as anonymized user details, customer name, and user navigation workflows such as menus the users access and clicks.

An administrator can disable the **Usage statistics** option by changing the settings in the Control Room.

---

**Note:** The option can be disabled only for On-Premises deployments.

---

## Disable usage statistics

An administrator can disable the **Usage statistics** option by changing the settings in the Control Room.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Administration > Settings > General > Advanced settings**.
2. Click **Edit**.
3. Select the **Disabled** option.
4. Click **Save changes**.

## Set up instances for Cloud-enabled deployments

Manage trust relationship between the cloud-deployed Automation 360 Cloud-enabled instance and the On-Premises applications.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

For Cloud-enabled deployment, the initial welcome email that you received from Automation Anywhere contains:

- URL to the Automation Anywhere Cloud-enabled instance
- Provisioning token needed to establish trust connectivity with the Automation Anywhere Cloud Control Room

Automation Anywhere deploys and configures an Automation Anywhere Automation 360 Cloud instance for this Cloud-enabled deployment option. The customer then installs the On-Premises application within their infrastructure for storing and processing customer data. After this is complete, you install the On-Premises application within your infrastructure for storing and processing customer data.

1. Log in to the On-Premises Control Room as the administrator.
2. Navigate to **Administration > Settings > Cloud-enabled**.
3. Provide the provisioning token to connect to the Control Room.
4. Click **Save changes**.
5. Optional: Test the Cloud-enabled functionality.  
Open a browser and enter the URL for the Cloud Control Room service instance. Click **Enter** to be redirected to the On-Premises Control Room.

## Generate registration key to install Bot agent in bulk

The Control Room administrator can generate a registration key to install the Bot agent on multiple devices at a time in bulk.

Ensure you have set up the Microsoft Active Directory group policy to remotely install the Bot agent on multiple devices.

*Use Microsoft Active Directory Group Policy to remotely install software*

Generate and copy the key for use in an installation script or as part of the Active Directory group policy to install the Bot agent on multiple devices at a time.

Also, download the latest Bot agent MSI installer file to your default downloads path to install the Bot agent in bulk.

1. Navigate to **Administration > Settings**.
2. Select the **Bot agent bulk install** option.
3. Generate a new registration key for installation.

---

**Note:** Before you generate a new key, keep in mind that the new key invalidates the previous key and any entries or references to the previous key must be replaced with the new key value. Therefore, we recommend that you generate a new key only if the previous key is compromised.

---

- a) To launch the setting in edit mode, click the **Edit** option.  
When you open this setting for the first time, the option **Generate a new key** is shown by default and the phrase `Key not set` appears.
  - b) To create a new registration key, select the **Generate a new key** option.
  - c) To install the Bot agent using an installation script or through a Active Directory group policy, click **Copy to clipboard**.
  - d) Save the settings.
4. Replace the registration key:
    - a) To launch the setting in edit mode, click the **Edit** option.  
The **Keep current key** option is displayed by default.
    - b) To generate a new registration key, select the **Generate a new key** option.
    - c) Select **Continue** on the **Current registration key replacement** message box.
    - d) To use the key, click **Copy to clipboard**.
    - e) Save the updates.
  5. To download the latest Bot agent MSI installer file, click **Download installer**.  
The Bot agent installer MSI file is downloaded to your default `Downloads` folder.

Edit the Bot agent MSI file to remotely install the Bot agent on multiple devices.

### Related tasks

[Perform silent installation of Bot agent on temporary devices](#)

Edit the Bot agent MSI file to silently install the Bot agent on temporary devices or non-persistent virtual desktop infrastructure (VDI) in the Control Room.

## Edit the Bot agent installer file

Edit the Bot agent MSI installer file to add the registration key and Control Room URL to remotely install the Bot agent on multiple devices.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task.

Ensure the Windows 10 Software Development Kit including Orca and Control Room are installed on your device. You can install Orca from `C:\Program Files (x86)\Windows Kits\10\bin\10.0.18362.0\x86\Orca-x86_en-us.msi`.

Set up the Microsoft Active Directory group policy to remotely install the Bot agent on multiple devices.

[Use Microsoft Active Directory Group Policy to remotely install software](#)

Edit the Bot agent .msi file to enable the Control Room administrator to implement the auto-update Bot agent policy.

1. Download the latest Bot agent MSI installer file from the Control Room (**Administrator > Settings > Bot agent bulk install**) to your default download path.
2. Copy the AutomationAnywhereBotAgent.msi installer file.
3. Navigate to <application filepath>\crui\asset  
For example C:\Program Files\Automation Anywhere\Enterprise\crui\asset
4. Paste the AutomationAnywhereBotAgent.msi installer file.
5. Edit the AutomationAnywhereBotAgent.msi file using Orca tool.
6. Click the **Property** option.
7. Change the value for AA\_CRTOKEN and AA\_CRURL.  
The AA\_CRTOKEN uses the registration key and the AA\_CRURL uses the Control Room URL for which the registration key is generated.
8. Save your changes.

## Licenses

The Automation Anywhere Control Room provides an automated mechanism for tracking the use of licensed software.

Automation Anywhere Control Room administrators view and manage user license entitlements on this page.

To add licenses for users, select the desired method of accessing the license by clicking **Install license from server** or **Install license from file**.

### Installing additional licenses

Upload new licenses to the Automation Anywhere Control Room to be distributed to users as required.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

Designate the source of the license (server or filepath) to load into the Control Room.

1. Navigate to **Administration > Licenses**.
2. Select **Install license from server** or **Install license from file**.  
Choose installation source.

Option	Action
<b>Install license from server</b>	<ol style="list-style-type: none"> <li>a. Supply the unique Control Room GUID.</li> <li>b. Click <b>Install license from server</b>.</li> </ol>
<b>Install license from file</b>	<ol style="list-style-type: none"> <li>a. Browse to and select the license.</li> <li>b. Click <b>Install license from file</b>.</li> </ol>

#### Related reference

[User management](#)

As a Cloud user with administrator permissions, you can create, view, edit, delete, and enable or disable a user. Creating users steps vary depending on whether the user is a non-Active Directory, Active Directory, or single sign-on (SSO) user from an IdP server.

### System roles

System roles are preconfigured with the permissions necessary to perform the tasks within the scope of that role. They cannot be modified or deleted. Administrators assign the roles to users to enable them to access features and perform operations in the Control Room.

### Settings

Use the **Settings** tab to configure the connection to the Credential Vault, enable email notifications, integrate the Control Room with a Git repository, enable secure recording mode, and configure user authentication.

## Stop and start Control Room services on Linux

Review the instructions and service names to stop and restart Automation Anywhere Control Room services on Linux.

Log in to your Automation Anywhere Control Room server.

1. If you just finished installing A2019, use the following command to display the status of all Control Room services:

```
sudo systemctl status control*
```

Browse through the output. If any of the services are not actively running, you can manually start the service with the following command (see the next step for specific service names):

```
sudo systemctl start <servicename>
```

---

**Note:** If more than one service is not running, you can use the script in the next step to start all the services.

---

For other Linux installation issues, contact Automation Anywhere support: [Open a support case \(A-People login required\)](#).

2. Optional: Create a script from the following code, such as `startallaae.sh`, to start all the Control Room services.

The `sleep` commands allow each service to complete startup before the next service is started.

---

**Note:** `controlroomdiscoverybot.service` is only installed by default starting in Automation 360 version 16.

---

```
echo Starting elasticsearch
sudo systemctl start controlroomelasticsearch.service
sleep 30
echo Starting botcompiler
sudo systemctl start controlroombotcompiler.service
sleep 30
echo Starting control room caching
sudo systemctl start controlroomcaching.service
sleep 30
echo Starting backend service
sudo systemctl start controlroombackend.service
sleep 30
echo Starting reverse proxy
sudo systemctl start controlroomreverseproxy.service
sleep 30
echo Starting messaging
sudo systemctl start controlroommessaging.service
```

```

sleep 30
echo Starting iq bot
sudo systemctl start controlroomiqbot.service
sleep 30
echo Starting discovery bot
sudo systemctl start controlroomdiscoverybot.service
sleep 30
echo Starting aari
sudo systemctl start controlroomaari.service
sleep 30
echo Starting storage
sudo systemctl start controlroomstorage.service
sleep 30

```

Assign execute permission to the script and run it: `sudo ./startallaae.sh`

3. To stop a single service, use the following command: `sudo systemctl stop <servicename>`.

**Optional:** To stop all services for maintenance or other requirements, create a script, such as `stopallaae.sh`, to stop the Control Room services.

```

sudo systemctl stop controlroommessaging.service
sudo systemctl stop controlroomreverseproxy.service
sudo systemctl stop controlroombackend.service
sudo systemctl stop controlroomcaching.service
sudo systemctl stop controlroombotcompiler.service
sudo systemctl stop controlroomelasticsearch.service
sudo systemctl stop controlroomiqbot.service
sudo systemctl stop controlroomdiscoverybot.service

sudo systemctl stop controlroomaari.service
sudo systemctl stop controlroomstorage.service

```

Assign execute permissions to the script and run it: `sudo ./stopallaae.sh`

## Control Room log files

Various types of information about the Control Room are captured in different log files. You can analyze these log files when the Control Room or a bot encounters an error and identify the root cause for that error.

### Overview

The log files capture information about the errors encountered by various components of the Control Room such as the Bot Store, devices, and license. You can use the information in the log files to identify the root cause of an error and resolve that error.

### Log file locations

The Control Room log files are available at `C:\ProgramData\AutomationAnywhere\Logs` on the machine on which you have installed the Control Room. The log files are named `WebCR_<COMPONENT-NAME>`, for example, `WebCR_BotStore`, `WebCR_Devices`, and `WebCR_License`.

You can refer the following log files for the Control Room.

#### **WebCR.log**

Contains log entries related to the initialization of the Control Room and messages, if any.

<b>WebCR_UserManagement.log</b>	Contains log entries related to the user management module.
<b>WebCR_Ignite.log</b>	Contains log entries related to the Apache Ignite or caching system.
<b>WebCR_ServerRepository.log</b>	Contains log entries of the server repository related functions.
<b>WebCR_CredentialVault.log</b>	Contains log entries of Credential Vault related function calls.
<b>WebCR_Hibernate.log</b>	Contains log entries related to the Hibernate system, ORM mapping and Query system, ActiveMQ messaging subsystem, and so on.

On the Bot Runner machine (on which the Bot agent is installed), the log files are available at `C:\ProgramData\AutomationAnywhere\BotRunner\Logs`. You can refer the following log files for the Bot Runner machine.

<b>NodeManager.log</b>	Contains log entry details of the interaction with the Bot agent and the log entry of every message sent to the Bot agent.
<b>BotLauncher.log</b>	Contains log entry details of the bots that are deployed on this machine.
<b>TriggerListener.log</b>	Contains log entry details of any triggering activities that occur in bots with triggers.

The corresponding configuration XML files are available at `C:\Program Files\Automation Anywhere\Bot Agent\config`.

## Add packages to the Control Room

Administrators can add packages to the Control Room for use by Bot Creators.

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

1. Navigate to **Bots > Packages**.
2. Click **Add package**.
3. Click **Browse**.
4. Locate and select the package to add to the Control Room.  
Packages are Java Archive (JAR) files that contain actions used to create bots.
5. Click **Upload package**.
6. On the **Bots > Packages > Confirm package** page, choose any of the following options:
  - **Accept, enable and set as default:** Uploads and enables the selected package, and sets it to the default package for the Control Room.
  - **Accept and enable:** Uploads and enables the package, but the package is not set as the default package. Bot Creators have to specifically select non-default packages to use them for creating bots.

Choosing **Reject** stops the upload process.

7. After installation, click **Administration > Packages** to verify that the package is added.

**Related concepts**

[Build and test a demo package and bot](#)

This practical how to section demonstrates that creating, changing, and managing packages allow you to customize actions and efficiently manage packages for all Control Room users.

**Related tasks**

[Manage Control Room packages](#)

Manage packages in the Control Room by setting a package as default, disabling it, or deleting it.

## External key vault integration CyberArk

The following is required information for CyberArk Integration configuration:

**Central Credential Provider API URL**

The CyberArk CCP URL endpoint on the CyberArk server.

**CyberArk Application ID**

The CyberArk issued Application ID.

**Certificate used to authenticate to CyberArk**

Control Room Client Certificate trusted by CyberArk AAM server. The certificate will be distributed in a passphrase protected file, you will need to enter the passphrase.

**Optional Certificate**

You can optionally load the CyberArk AIM Server certificate to the trust store here to make sure that the will trust the CyberArk server.

**Credential Identifiers to be used during installation**

- Safe and Object Name
- Database credentials
- Service Account Credential

This task is performed by the administrator. You must have the necessary rights and permissions to complete this task. Ensure you are logged in to the as the administrator.

**1. [Create credential](#)**

When External Key Vault is selected for Create Credential, the locker owner, or anyone with the necessary permissions to create a credential locker, will have the ability to specify an Object Name for the credential.

**2. [Create locker](#)**

When External Key Vault is selected for Create Locker, the only task the administrator will perform is "map" the locker name to the "prefix" for other key vault types.

## Bot Store

You can access Bot Store from the Control Room. From Bot Store, you can download bots or packages to your Control Room repository.

- Download bots to the Control Room repository
  - Download bots or packages from Bot Store to your Control Room repository.
- Submit bots to Bot Store
  - Submit bots or packages from the Control Room repository to Bot Store.

---

**Resources:** To learn more, see [Automation Anywhere Bot Store Learning Trail \(A-People login required\)](#).

---

### Related concepts

#### [Bot permissions for a role](#)

Assign bot permissions when creating a role with the **View my bots** feature permission.

## Access Bot Store from the Control Room

As a Bot Store registered user, you can log in to Bot Store from the Control Room.

You must have valid Bot Store credentials to access Bot Store from the Control Room. If you do not have valid Bot Store credentials, you must register with Bot Store.

1. Log in to the Control Room.
2. Click the **Bot Store** tab.  
Bot Store opens in a separate window (<https://botstore.automationanywhere.com>).
3. Log in using your Bot Store credentials.  
In the Control Room, you can see **My downloads** under the **Bot Store** tab.  
Watch the following video on how to find bots on Bot Store.

### Related concepts

#### [Bot Store](#)

You can access Bot Store from the Control Room. From Bot Store, you can download bots or packages to your Control Room repository.

### Related tasks

#### [Submit bots or packages to Bot Store](#)

You can submit bots or packages from the Control Room to Bot Store. If your bot includes dependencies, submit all dependencies. Submit a demo bot that demonstrates the use of the package.

#### [Download bots or packages to the Control Room](#)

You can download bots or packages from the Bot Store to the Control Room repository.

## Submit bots or packages to Bot Store

You can submit bots or packages from the Control Room to Bot Store. If your bot includes dependencies, submit all dependencies. Submit a demo bot that demonstrates the use of the package.

You must have a system-created **AAE\_Bot Store Publisher** role in order to submit bots or packages to Bot Store. See [System roles](#).

1. Download the A2019 Bot Store Bot template from GitHub: [A2019 Bot Store Bot Template](#).
2. Log in to the Control Room.
3. Log in to Bot Store using the Bot Store credentials.
4. Click **BOTS > My bots**.
5. Click **Public** workspace and select the **Bot Store** folder.

6. In the **My bots** page, move your mouse over the **Action** toolbar and click **Submit to Bot Store**.
  - a) In the **Submit to Bot Store** page, review the dependencies that will be bundled with your bot (including a parent bot) and make changes as required. In addition, ensure that the bot and all dependent bots and files are in the same folder to submit to Bot Store.
  - b) Click **Next** to review the **Bundled packages** to ensure all packages are included with your submission.
  - c) If the bot you want to submit and the bundled package look complete, click **Submit**.  
When choosing a name for your bot or package, ensure it is unique and descriptive so it is easily searchable on Bot Store.  
Alternatively, click **Back** to go back.  
When you submit your files, the system displays the following message: `<bot/package name> submission is in progress. Go to Bot Store > My Submissions` to complete your submission form. You will receive a confirmation email when the submission is completed.
  - d) Click **Take me to Bot Store** to complete your submission form in Bot Store.

When you resubmit files to Bot Store, it overwrites the previously submitted files, which are in a `Draft` status.

- It can takes three to five business days for review and approval of your bot or package.
- For any questions on bot and package submissions, contact [Contact Bot Store Support](#) or select the **Have questions about submitting a bot** option on Bot Store pages.

Watch the following video on how to create and submit bots to Bot Store.

### Related concepts

#### [Bot Store](#)

You can access Bot Store from the Control Room. From Bot Store, you can download bots or packages to your Control Room repository.

### Related tasks

#### [Access Bot Store from the Control Room](#)

As a Bot Store registered user, you can log in to Bot Store from the Control Room.

#### [Download bots or packages to the Control Room](#)

You can download bots or packages from the Bot Store to the Control Room repository.

## Download bots or packages to the Control Room

You can download bots or packages from the Bot Store to the Control Room repository.

You must have a system-created **AAE\_Bot Developer** role in order to download bots or packages to your Control Room repository. See [System roles](#).

1. Log in to the Control Room.
2. Log in to the Bot Store using the Bot Store credentials.
3. Click **Bot Store > My downloads**.
4. In **My downloads** page, move your mouse over the **Action** toolbar and click **Add to My bots**.  
The following message appears: `If you have any files already installed in private workspace, they will be overwritten.`
5. Select **Yes, continue** to overwrite an existing file and continue with the installation, or select **No, cancel** to cancel your download.  
In **My downloads** page, the installation status of the selected file changes to `Installed`.

6. Verify the downloaded bots in the Bot Store folder of the private workspace.  
Custom packages downloaded from the Bot Store are available from the **Packages** repository. Or, you can access them from the **Bot Editor > Action Palette**.
7. Verify that the downloaded packages have been enabled in the **Packages** repository. If the packages are not enabled, then go to individual packages and enable them.

Watch the following video on how to download a Bot Store bot to your Control Room.

### Related concepts

#### [Bot Store](#)

You can access Bot Store from the Control Room. From Bot Store, you can download bots or packages to your Control Room repository.

### Related tasks

#### [Access Bot Store from the Control Room](#)

As a Bot Store registered user, you can log in to Bot Store from the Control Room.

#### [Submit bots or packages to Bot Store](#)

You can submit bots or packages from the Control Room to Bot Store. If your bot includes dependencies, submit all dependencies. Submit a demo bot that demonstrates the use of the package.

## Getting started with Private Bot Store

Use Private Bot Store to view and submit bots and bot use cases within your company. Use admin tools to review and publish bots and manage users.

The following is a high-level overview of how to get started with Private Bot Store:

1. The Private Bot Store support team creates admin users for your company.
2. Optionally, the support team helps you set up SAML-based SSO or Active Directory Federation Services (ADFS) integration.
3. Admin users grant other users Private Bot Store access and permissions. (It is automated if you use SAML-based SSO or ADFS).
4. Users create bot listings and submit them for approval.
5. Admin users can approve or reject the submitted bots.
  - If approved, the bot listing is published and is available on Private Bot Store for other users within the organization to view.
  - If rejected, the bot author receives feedback on what has to be updated. The bot author updates the bot and resubmits it.
6. Other employees within the company access the published bot listings and use them in their automation tasks.

### Related concepts

#### [Private Bot Store](#)

Private Bot Store is a secure internal bot marketplace for a company to post and share details and documentation for all internally developed bots. Employees can easily discover internal bots and commands to reuse in addition to all of the bots from the Automation Anywhere Bot Store vendors.

## Set up A-People user access to Private Bot Store

A-People user access and management is included out-of-the-box with Private Bot Store. Within Private Bot Store, your company admin can manage users. Other users with granted permissions can access Private Bot Store with the same credentials they use for public Bot Store and other Automation Anywhere sites.

- **Set up A-People user access**

After your first admin users get access to Private Bot Store, they can add additional users. Any Private Bot Store user with admin access can manage users from the **Private Bot Store - User Access Settings** page.

- **Add new users individually or in bulk**

- a) Navigate to **User Access Settings**.
- b) Click **Add Users**.
- c) Enter the email addresses for the users you want to add.  
Invited users will receive an invitation email with instructions to set up their account.

- **Change user permission level**

Only admin users can modify permission levels by selecting the correct level in the **Access** panel.

- **Delete users**

Select **Delete** in the **Actions** panel.

### Related tasks

[Submit and approve bots using Private Bot Store](#)

Use Private Bot Store to submit, review, and approve detailed bot listings for all of the bots your team has built.

## Set up SAML user access to Private Bot Store

Use SAML-based single sign-on (SSO) or Active Directory access to ensure that your Private Bot Store user access is updated automatically when users join or leave your company. Users can log in to Private Bot Store using the same credentials they use for other applications.

- **Set up SSO or Active Directory Federation Services (ADFS) user access**

The Private Bot Store support team will help you set up **SSO** or **Active Directory** user access.

- Provide details about Private Bot Store in your identity provider (IdP) settings.
- Provide the Private Bot Store support team some information about your system.

The Private Bot Store support team will verify the information and complete the integration.

After the integration is completed, your Private Bot Store user access will be managed automatically by your SSO or ADFS user access.

- **Change user permission level**

Admin users can change a user's permission level by navigating to the Private Bot Store **Settings** page and updating user permissions.

Admins can only modify a user permission level if a user is an active Private Bot Store user.

## Related tasks

### [Submit and approve bots using Private Bot Store](#)

Use Private Bot Store to submit, review, and approve detailed bot listings for all of the bots your team has built.

## Submit and approve bots using Private Bot Store

Use Private Bot Store to submit, review, and approve detailed bot listings for all of the bots your team has built.

- **Submit internal bots:**

To submit a new bot:

- a) From Private Bot Store, click **My Submissions**.
- b) Click **Add New Bot**.
- c) Enter all the required fields, such as bot description, benefits, and requirements.
- d) Review the documentation examples for each field and follow the suggested guidelines.
- e) Click **Submit** or click **Save** to save the bot before submitting it.

After you submit your bot, your Private Bot Store admin team receives an email to review the bot.

Your bot will be published or it might be send back for an update and resubmission.

- **Review internal bot submissions**

Private Bot Store admin users approve or reject bot submissions before they can be published.

- a) As an admin user, navigate to Private Bot Store and click **All Submissions**.
- b) Click **Review Bot** to review each submitted bot.
- c) Approve or reject the submitted bot:

- **Approve and publish a bot:** On the **Review Bot** page, click **Approve** to publish the bot.
- **Reject the bot and request updates:** On the **Review Bot** page, click **Reject** to reject the bot and send feedback to the bot submitter with instructions for updates.

## Submit and manage bot ideas using Private Bot Store

Use Private Bot Store to submit, manage, and prioritize bot ideas for your development requirements.

- **Submit bot ideas**

- a) From Private Bot Store, click **Suggest Bot Idea**.
- b) Fill in all the fields about your bot idea, with as much detail as possible.
- c) Click **Submit**.

After you submit the bot idea, your admin team will review and prioritize it. The admin team might contact you for more information about your bot idea.

- **Manage bot ideas**

Private Bot Store admin users can manage and prioritize bot ideas.

- a) As an admin user, navigate to Private Bot Store and click **Manage Bot Ideas**.
  - b) Click **Review** to review each submitted bot idea.
  - c) Edit any of the fields as required.
  - d) Select a **Bot Priority** level for the bot idea.
  - e) Click **Save**.
  - f) Click the **Mail** icon to contact the bot idea submitter to request additional details.
- Watch the following video on how to submit a bot idea to Bot Store.

## Custom filter management in Private Bot Store

Create your own filters and tags to organize your automations in Private Bot Store using the custom filter management page.

Custom filter management enables you to perform the following activities:

- Rename any of the default filters such as **Applications** and **Departments**, and tags (specific categories) such as **Excel** and **Finance**.
- Add up to six of your own custom filters.
- Add your own custom tags, with up to three nested layers of tags, for example, 2021 > Q1 > January.
- Select which filters you want to appear first in your Private Bot Store navigation.
- Select up to five top tags to appear first under their filter.

The custom filters are displayed throughout Private Bot Store, including:

- In the top navigation, filters on the left, and search results.
- On the listing submission form, where bot builders can select custom tags for their bots.
- On bot detail pages, where users can see how each bots is categorized.

### Edit filters

1. You must have an admin user permission to access the **Manage Filters** page in Private Bot Store.
2. Navigate to **Private Bot Store > Manage Filters > Admin Tools > Manage Filters**.
3. Edit the default filters to match your company terminology.

Whenever possible, use default filter names, such as **Departments**, rather than creating your own filters. As a result, all the existing bots are already tagged and you do not have to tag them again.

4. Under **Actions**, click the **Rename Filter** action (pencil icon) to rename the filter.
5. Click **Add Filter** to add a new filter. Enter the name for the new filter.  
You can add up to six custom filters.
6. Select a filter and click **Reorder entry** on the left and place the filter into your desired order.  
The filter order is reflected in the Private Bot Store navigation and the filter panel.

7. Click the delete (X) action in the right column to delete any custom filter.  
You cannot delete default filters.

## Edit tags

1. Navigate **Admin Tools > Manage Filters > Actions** select a filter and click the tree icon **Add and Edit Tags** action.
2. Select a tag and click the tree icon to **Add Child Tag** within a tag. Enter a new child tag name.  
You can add up to three layers of nested tags.
3. Click the **Rename Tag** action to rename any tag.  
For the default tags, the original **Tag Name** continues to appear in the **Default Name** column for your reference.
4. Select up to five **Top Tag** in the left column to display those tags at the top of the list within each filter.  
Use this for your company most-used applications or other important bot categories. Other than the selected **Top Tag**, tags are displayed in alphabetical order.
5. Click the delete (X) action to delete any custom tag.  
You cannot delete the default tags.

# Bot Lifecycle Management

The Automation Anywhere Bot Lifecycle Management (BLM) feature enables you to move a bot from one environment to another. For example, you can move a bot from the development or testing environment to the production environment.

## Overview

Bot Lifecycle Management easily integrates with the DevOps workflow that supports separate development, testing, acceptance, and production environments and it enables you to move bots along with their dashboards from one environment to another.

You can use the feature to move bots within different environments and help you prevent any failure or disruption of data. You have to export and then import a bot to move it from one environment to another. You can also bundle all the dependencies of a bot when transitioning it through the different environments.

## Import 11.x bots in Automation 360 for migration

Use the feature to import your 11.x bots from the 11.x Control Room instance to Automation 360. This enables you to consolidate the 11.x bots from multiple Control Room repositories to a single Automation 360 repository. You can migrate the imported 11.x bots in Automation 360 using the migration wizard.

## Permissions required to move bots

To export from the Control Room, you must have the following permissions:

- **Export bot** and **View packages** feature permissions
- **Check in** or **Check out** folder permissions

To import a bot to the Control Room, you must have the following permissions:

- **Import bot** and **Manage package** feature permissions
- **Check in** folder permission

## Moving a bot

To move a bot from one environment to another, follow these steps:

1. Export the bot from the Control Room in the source environment.
2. Import the bot into the Control Room in the destination environment.

### Related concepts

#### [Bot Lifecycle Management API](#)

Use the Bot Lifecycle Management API to export and import bots with dependent files and command packages for comprehensive automation lifecycle management. Users can export bots from public workspace and import to a private workspace in another Control Room and check into a public workspace.

## Guidelines for exporting and importing bots

Review the guidelines before you export or import bots.

### Guidelines for exporting bots

- Export the action packages along with the bot because the packages in the target Control Room to which you are importing the bot might be different.
- Export the bots folder-wise by moving all the bots from one folder first before moving to the next folder. So do not select the bots from the different folders
- Ensure your SMTP (email) server is integrated with the Control Room so that you can receive a link to the exported package through email.

#### *Email server settings*

- Ensure that the source and target Control Rooms have the same set of global values.
- Ensure that the source and target Control Rooms have the same set of lockers and credentials that are referred in the bots.

### Guidelines for importing bots

- **Recommended:** When importing bot from the **Bots > My bots** page, use the **Skip the bot or file (don't import it)** option because you might want to check the bot first before overwriting it with the imported bot.
- **Recommended::** First import the bots to your private repository (if you are a bot developer), verify the bot, and then check it in to the public workspace.
- The bot directory path is case-sensitive, so ensure that the export and import paths use the same letter case in the Control Room.

## Export bots

You can export a bot from one Control Room to another.

- Only bots in the public workspace can be exported. To export bots, first check these bots into the public workspace before exporting them to the private workspace.
- Ensure that you have the `View package` permissions.
- Ensure that you have the `View content` rights at the folder level from which you want to export the bots.
- Ensure that the version of Control Room and packages in the source and target Control Room are same for export as well as import.
- 

Review the guidelines before you export bots.

*[Guidelines for exporting and importing bots](#)*

---

**Note:** The Control Room maintains a maximum of 10 GB of historical export files in the download directory. Files are deleted on a first-in/first-out basis in order to maintain this threshold.

---

1. Navigate to **BOTS > My bots**.
2. From the public directory, select the bot you want to export. Click the **Export bots** icon.  
The selected bot as well as the required dependencies are displayed in the Bots and Files window.
3. Click **Next**.  
The bot and its dependencies are ready for export and displayed in the **Review Dependencies** window.
4. Click **Next**.  
All related packages are displayed.
5. Select the necessary packages associated with the bot to export.  
Select **Exclude bot packages** to remove all packages from the export.
6. Click **Export bots and files**.  
All the selected bots are exported into a `zip` file.

---

**Note:** If you have analytics bots in your Control Room, all the Bot Insight dashboards (default, custom, and published) associated with the bots are also exported into the `zip` file.

---

If you have configured SMTP, an email is sent that contains a link to the zip file of the exported package.

If you have not configured SMTP, perform the following steps to access the link to the zip file of the exported package:

- a) Navigate to **ACTIVITY > Historical**.
  - b) Search and view the historical activity of the exported package.
  - c) Click **Download exported zip file**.  
A link to download the zip file is displayed.
7. Use the link to download the zip file and save it to a location for importing it to another Control Room.

Import the bots into an Control Room.

### Related tasks

[Import bots](#)

You can import bots with their dependencies from one Control Room to another. The source environment can be either an Automation 360 Control Room or a 11.x Control Room instance.

#### [Export files using API](#)

You can export bots with their dependent files using the Export API.

#### **Related reference**

##### [System roles](#)

System roles are preconfigured with the permissions necessary to perform the tasks within the scope of that role. They cannot be modified or deleted. Administrators assign the roles to users to enable them to access features and perform operations in the Control Room.

## Import bots

You can import bots with their dependencies from one Control Room to another. The source environment can be either an Automation 360 Control Room or a 11.x Control Room instance.

- Ensure that the following rights are enabled to import bots:
  - Import bots permission
  - Create folder permission, if it is required
  - Check-in to public workspace permission if you are importing to the public workspace
- Ensure that the version of Control Room and packages in the source and target Control Room are same for export as well as import.
- You must have a Bot Creator license to import bots either into the private workspace or public workspace.

You can import bots into the public workspace if you have the required permissions, regardless of your license.

- To import the 11.x bots into your Automation 360 Control Room, consider the following additional requirements:
  - You must have the required `aapkg` package that you created using the BLM export feature in the 11.x Control Room instance.
  - The `aapkg` package must be present in the same Automation 360 machine where you want to import the 11.x bots.
  - You can import the password protected `aapkg` packages using the BLM Import API only.

#### [Import files using API](#)

- Review the guidelines before you import bots.

#### [Guidelines for exporting and importing bots](#)

- To import bots from one Control Room to another, use the exported `zip` file (or `aapkg` file, in case of 11.x bots). If the SMTP is configured, you will receive a link to download the `zip` or `aapkg` file on your configured email address. If SMTP is not configured, you can access the download link by navigating to **Activity > Historical** page.

1. Navigate to **BOTS > My bots**.
2. Click **Import bots**.
3. Browse and select the required `zip` file or `aapkg` file based on your source environment:

Source environment	Action
<b>Automation 360 bots</b>	Select the required <code>zip</code> file.
<b>11.x bots</b>	Select the required <code>aapkg</code> file.

4. Select the private workspace or public workspace based on your following source environment:

Source environment	Action
<b>Automation 360 bots</b>	<p>You can select either the private or public workspace as required.</p> <p>If you have analytics bots in your source Automation 360 environment, then all the associated Bot Insight dashboards are also imported based on the following selection:</p> <ul style="list-style-type: none"> <li>• If you select the private workspace, you can view only default and custom dashboards.</li> </ul> <p>To view published dashboards, you must check in the bots to the public workspace.</p> <ul style="list-style-type: none"> <li>• If you select the public workspace, you can view only published dashboards.</li> </ul> <p>To view default and custom dashboards, you must check out the bots to the private workspace.</p>
<b>11.x bots</b>	<p>Select the public workspace.</p> <p>This selection enables you to migrate 11.x bots to the Automation 360 environment later during migration.</p>

5. If some of the files that are being imported from the package are already available in your Control Room, choose one of the following options:

- **Skip the bot or file (don't import it)**
- **Overwrite the bot or file with the imported one**

6. Click the **Import bots** option.

7. After the import is complete, based on your source environment, navigate to the corresponding repository to find and use the imported bot:

Source environment	Action
<b>Automation 360 bots</b>	Navigate to the corresponding workspace (private or public, based on your selection in Step 4).
<b>11.x bots</b>	<p>Navigate to the public workspace in the <b>Bots &gt; My Tasks</b> folder or <b>Bots &gt; My Metabots</b> folder.</p> <hr/> <p><b>Note:</b> 11.x bots are imported in <code>.atmx</code> and <code>.mbot</code> format. Use the migration wizard to convert the 11.x bots files to the <code>.bot</code> format, which is supported in Automation 360.</p> <p><a href="#">Migrate Enterprise bots</a></p> <hr/>

### Related tasks

#### [Export bots](#)

You can export a bot from one Control Room to another.

#### [Import files using API](#)

You can import bots with their dependent files using the Import API.

### Related reference

#### System roles

System roles are preconfigured with the permissions necessary to perform the tasks within the scope of that role. They cannot be modified or deleted. Administrators assign the roles to users to enable them to access features and perform operations in the Control Room.

## Control Room APIs

The Automation Anywhere Control Room provides various APIs that allow you to customize the way that you (and your bots) interact with Automation Anywhere. Users can perform tasks such as manage bot deployments, create and manage credentials in the Credential Vault, create and manage user accounts and roles, and create and manage queues.

### Getting started with Control Room APIs

The Control Room APIs use the standard HTTP methods GET, POST, PUT, and DELETE and standard HTTP codes for responses. See [API response codes](#). All requests must include an X-Authorization header with the JSON authentication token. See [Authentication API](#).

API requests are made to a live Control Room, not a test environment. When you make API requests through Swagger or a REST client, the requests can impact your users, bots, and other resources.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

Watch the following video to learn how to test Control Room APIs in Swagger and Postman:

This is the Postman collection mentioned in the video: <https://www.postman.com/collections/bb5cd3541d29e192cd43>

### API tutorials

The following tutorials demonstrate how to combine endpoints to perform a task programmatically. Each tutorial includes code examples and describes the prerequisites necessary to use the endpoint.

The tutorials assume that you have a Control Room configured with users, roles, and bots. If you have not already done so, [Configure the Control Room](#).

- [Configure the Credential Vault for your organization](#)

As a Locker admin, configure a locker and a credential, then assign the credential to the locker.

- [Create workload automation](#)

Combine the endpoints from the Workload Management API to programmatically create WLM queues and run bots.

- [Deploy a bot](#)

Deploy a bot to an unattended Bot Runner.

- [Create an automation schedule](#)

Schedule a bot to run on an unattended Bot Runner either one time or on a recurring basis.

## Configure the Control Room

Before you start creating workflows for bot deployment and workload management (WLM) using Control Room APIs, ensure you complete specific prerequisites and steps in the Control Room.

Ensure you have following licenses and permissions:

- One or more Bot Creator and unattended Bot Runner licenses.
- Control Room admin credentials to view, create, and configure users, roles, and device pools.
- The **Create device pools** feature permission or the **AAE\_Pool Admin** role must be assigned to you.

Follow these steps to configure your Control Room with users, roles, and bots.

1. Log in to the Control Room as an admin.

2. Create a Control Room user.

Ensure that the user is assigned the **AAE\_BASIC** role.

*Create a user*

3. Create a custom role to map the users you created to Bot Runners and `Bot` folders.

- In the **Features** tab, ensure you select these permissions: **View my Scheduled Bots**, **Schedule my bots to run**, **Run my Bots**, **View my Bots**, and **Generate my API Key**.
- In the **Bots** tab, expand the **Bots** folder and select the root folder or subfolders you want to provide access for use. Ensure you select these permissions: **Run and schedule** and **View content**.
- In the **Run as** tab, select one or more Bot Runners from the list of **Available bot runners**.
- In the **Users** tab, select the new user created in Step 1 to assign the custom role to this new user.

4. Create a new device pool.

In the **Consumers** tab, ensure you select the custom role you created in Step 3.

*Create device pools*

5. Log in to the Control Room as a Bot Creator and create bots to automate routine business tasks.

*Build a Go be Great bot*

Ensure you check in the bots in the `Bot` folder or folders selected when creating the custom role (Step 3). *Check in a bot*

## Audit API

Use the Audit API to request audit data for a given input combination of date filter, sorting mechanism, and pagination.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).
- Users with the **AAE\_Admin** role or users with the **View everyone audit log actions** permission can view audit logs for the Control Room.

1. Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).

- Apply filters to perform basic conditional queries and pagination control for processing web pages. There are three basic features related to filtering: filtering conditions, sorting columns, and pagination parameters.

*Filters in an API request body*

- Use the POST method and endpoint URL: <your\_control\_room\_url>/v1/audit/messages/list.

The following example requests unsuccessful login attempts for the month of December, 2019.

**Request body:**

```
{
  "sort": [
    {
      "field": "createdOn",
      "direction": "desc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "gt",
        "field": "createdOn",
        "value": "2019-12-01T00:00:00.001Z"
      },
      {
        "operator": "lt",
        "field": "createdOn",
        "value": "2019-12-31T23:59:59.999Z"
      },
      {
        "operator": "eq",
        "field": "status",
        "value": "Unsuccessful"
      },
      {
        "operator": "substring",
        "field": "activityType",
        "value": "LOGIN"
      },
      {
        "operator": "substring",
        "field": "userName",
        "value": "joe.typical@myemiil.com"
      }
    ]
  },
  "fields": [],
  "page": {
    "length": "1000",
    "offset": "0"
  }
}
```

- Send the request.

The response for this example returns data for the date filter, sorting, and pagination. If no filtering is used in the request, a successful response returns all pages for the specified Control Room.

**Response body:**

```
{
```

```

"page": {
  "offset": 0,
  "total": 731064850,
  "totalFilter": 9
},
"list": [
  {
    "id": "XlHj6G4BFXSp00ji5B7S",
    "eventDescription": "User does not exist in Control Room.",
    "activityType": "LOGIN",
    "environmentName": "",
    "hostName": "12.xxx.xx.x",
    "userName": "joe.typical@myemiil.com",
    "status": "Unsuccessful",
    "source": "Control Room",
    "objectName": "N/A",
    "detail": "",
    "createdOn": "2019-12-09T04:21:19Z",
    "requestId": "04965c2e-82e0-4ce4-a88d-bebe1dc3a2a8",
    "createdBy": "0"
  },
  {
    "id": "g1Hj6G4BFXSp00ji2Rwx",
    "eventDescription": "User does not exist in Control Room.",
    "activityType": "LOGIN",
    "environmentName": "",
    "hostName": "12.xxx.xx.x",
    "userName": "joe.typical@myemiil.com",
    "status": "Unsuccessful",
    "source": "Control Room",
    "objectName": "N/A",
    "detail": "",
    "createdOn": "2019-12-09T04:21:16Z",
    "requestId": "61672553-477d-4012-ab47-2a27f6553c4e",
    "createdBy": "0"
  },
  .....
  {
    "id": "ETyk6G4BFXSp00jiaJjt",
    "eventDescription": "User does not exist in Control Room.",
    "activityType": "LOGIN",
    "environmentName": "",
    "hostName": "12.xxx.xx.x",
    "userName": "joe.typical@myemiil.com",
    "status": "Unsuccessful",
    "source": "Control Room",
    "objectName": "N/A",
    "detail": "",
    "createdOn": "2019-12-09T03:11:58Z",
    "requestId": "ebeb01de-1f81-4a7c-8978-405806e146bd",
    "createdBy": "0"
  }
]
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

### Related concepts

[Example of createdOn date and userName filters in Audit API](#)

Create a filter that retrieves audit log entries for a specified date range for a user with a specific value in the **userName** field.

## Example of createdOndate and userName filters in Audit API

Create a filter that retrieves audit log entries for a specified date range for a user with a specific value in the **userName** field.

Use filtering to help narrow your results. The following example identifies unsuccessful login attempts for users with the value "john, doe" in the **userName** field from December 1, 2020 through December 31, 2020.

### Request body:

```
{
  "sort": [
    {
      "field": "createdOn",
      "direction": "desc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "gt",
        "field": "createdOn",
        "value": "2020-12-01T00:00:00.001Z"
      },
      {
        "operator": "lt",
        "field": "createdOn",
        "value": "2020-12-31T23:59:59.999Z"
      },
      {
        "operator": "eq",
        "field": "status",
        "value": "Unsuccessful"
      },
      {
        "operator": "substring",
        "field": "activityType",
        "value": "LOGIN"
      },
      {
        "operator": "substring",
        "field": "userName",
        "value": "john,doe"
      }
    ]
  },
  "page": {
    "length": "1000",
    "offset": "0"
  }
}
```

This request identified three audit log entries out of 731,148.339 entries from this Control Room log entries.

**Response body:**

```

{
  "page": {
    "offset": 0,
    "total": 731148339,
    "totalFilter": 3
  },
  "list": [
    {
      "id": "kLjB8G4BFXSp00jioMk1",
      "eventDescription": "User does not exist in Control Room.",
      "activityType": "LOGIN",
      "environmentName": "",
      "hostName": "50.xxx.xxx.xx",
      "userName": "john,doe@mycompany.com",
      "status": "Unsuccessful",
      "source": "Control Room",
      "objectName": "N/A",
      "detail": "",
      "createdOn": "2020-12-10T17:00:52Z",
      "requestId": "3c0f8e47-5820-43e8-b2b3-83b2f1cb86c9",
      "createdBy": "0"
    },
    {
      "id": "SLjB8G4BFXSp00jikl5i",
      "eventDescription": "User does not exist in Control Room.",
      "activityType": "LOGIN",
      "environmentName": "",
      "hostName": "50.xxx.xxx.xx",
      "userName": "john,doe@mycompany.com",
      "status": "Unsuccessful",
      "source": "Control Room",
      "objectName": "N/A",
      "detail": "",
      "createdOn": "2020-12-10T17:00:48Z",
      "requestId": "eba3e5a7-0034-440a-a786-110a84fea7c9",
      "createdBy": "0"
    },
    {
      "id": "7bjB8G4BFXSp00jicEGO",
      "eventDescription": "User does not exist in Control Room.",
      "activityType": "LOGIN",
      "environmentName": "",
      "hostName": "50.xxx.xxx.xx",
      "userName": "john,doe",
      "status": "Unsuccessful",
      "source": "Control Room",
      "objectName": "N/A",
      "detail": "",
      "createdOn": "2020-12-10T17:00:39Z",
      "requestId": "64184450-aad5-4024-bcf5-491fb5276d0c",
      "createdBy": "0"
    }
  ]
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

**Related concepts**

[Filters in an API request body](#)

Filtering provides basic conditional queries and page control for processing API requests. There are three basic components to filtering: conditions, sorting, and pagination parameters.

### Related tasks

#### [Audit API](#)

Use the Audit API to request audit data for a given input combination of date filter, sorting mechanism, and pagination.

## Authentication API

Use the Authentication API to generate, refresh, and manage the JSON Web Tokens (JWTs) that are required for authentication and authorization in order to use the Control Room APIs.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### Set up authentication or authorization for your application

1. Generate a token with one of the following endpoints:

---

**Note:** Tokens have a default timeout of 20 minutes.

---

- [Authenticate with username and password API](#)

If you are trying out the Control Room APIs in Swagger or another REST client, use this authentication method.

- [Authenticate with username and apiKey API](#)

Use this authentication method to generate the token without the need for the user's password, such as for organizations that use single sign-on (SSO).

- **Simple and Protected Negotiation GSSAPI Mechanism (SPNEGO)**

You can use SPNEGO if your Control Room is configured with the Active Directory (AD) mode of authentication and it is Kerberos-enabled.

In a Control Room configured with SPNEGO, you can use the following URL to generate a token:  
[https://<your\\_control\\_room\\_url>/v1/authentication/SPNEGO](https://<your_control_room_url>/v1/authentication/SPNEGO)

2. [Validate an authentication token API](#)
3. [Refresh a valid authentication token API](#)
4. [Expire an authentication token API](#)

## Authenticate with username and password API

Generate a JSON Web Token with your Control Room `username` and `password`. By default, a token is valid for 20 minutes.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

To generate the token, you require a valid `username` and `password` to the Control Room.



```

. . .
],
"licenseFeatures": [
  "RUNTIME"
],
"emailVerified": true,
"passwordSet": true,
"questionsSet": true,
"enableAutoLogin": false,
"disabled": false,
"clientRegistered": false,
"description": "",
"createdBy": 1,
"createdOn": "2019-10-10T13:39:56-05:00",
"updatedBy": 1,
"updatedOn": "2019-10-13T02:09:38-05:00",
"publicKey": null,
"appType": null,
"routingName": null,
"appUrl": null
}
}

```

Insert the token in the request header of subsequent API requests.

### Related concepts

#### [Authentication API](#)

Use the Authentication API to generate, refresh, and manage the JSON Web Tokens (JWTs) that are required for authentication and authorization in order to use the Control Room APIs.

## Authenticate with username and apiKey API

Generate a JSON Web Token with your Control Room `username` and an `apikey`. This endpoint enables users to generate the token without the need for the user's password, such as for organizations that use single sign-on (SSO). By default, a token is valid for 20 minutes.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

To generate the token, you require the following:

- A custom role with the Generate API-Key permission
- Valid `username` and `API-key` to the Control Room. The `API-Key` is a 40-character string generated in the Control Room.

*[Create and assign API key generation role](#)*

1. Use the POST method and endpoint URL: `<your_control_room_url>/v1/authentication`.

### Request body:

```

{
  "username": "jdoe",
  "apiKey": "3/.Z)8:P`+yVJq . . . *fTk.i>|VOO1&:"
}

```

```
}

```

**Request body with domain:** Depending on how your Control Room is configured, a domain might be required with the `username`.

```
{
  "username": "your-domain\\jdoe",
  "apiKey": "3/.Z)8:P`+yVJq . . . *fTk.i>|VOO1&:"
}
```

## 2. Send the request.

**Response body:** A successful response returns the token as a 703-character string.

```
{
  "token":
  "eyJhbGciOiJSUzUxMiJ9.eyJzdWIiOiIxIiwiaWF0IjoiY2xpZW50VHlwZSI6IldFQiIsImxpY2Vuc2VzIjpbXSwiY
  t1lCBg_cDGbwj5FvaBt9u5xKu5W5j3Nur6x3PF62NeB3ZIdxiUPaFBU0Br84mPJMD4_EpwBfbeSVOMH6ngiL
  oV-U1Iw0JHiX2-Ug",
  "user": {
    "id": 9,
    "email": "a@a.com",
    "username": "jdoe",
    "domain": null,
    "firstName": "",
    "lastName": "",
    "version": 9,
    "principalId": 9,
    "deleted": false,
    "roles": [
      {
        "name": "API_Key_Generation",
        "id": 23,
        "version": 0
      },
      {
        "name": "AAE_Basic",
        "id": 2,
        "version": 0
      },
      {
        "name": "Docrole1",
        "id": 18,
        "version": 0
      }
    ],
    "sysAssignedRoles": [],
    "groupNames": [],
    "permissions": [
      . . .
    ],
    "licenseFeatures": [
      "RUNTIME"
    ],
    "emailVerified": true,
    "passwordSet": true,
    "questionsSet": true,
    "enableAutoLogin": false,
    "disabled": false,
    "clientRegistered": false,
    "description": ""
  }
}
```

```

    "createdBy": 1,
    "createdOn": "2019-10-10T13:39:56-05:00",
    "updatedBy": 1,
    "updatedOn": "2019-10-13T02:09:38-05:00",
    "publicKey": null,
    "appType": null,
    "routingName": null,
    "appUrl": null
  }
}

```

Insert the token in the request header of subsequent API requests.

### Related concepts

#### [Authentication API](#)

Use the Authentication API to generate, refresh, and manage the JSON Web Tokens (JWTs) that are required for authentication and authorization in order to use the Control Room APIs.

### Related tasks

#### [Authenticate with username and password API](#)

Generate a JSON Web Token with your Control Room `username` and `password`. By default, a token is valid for 20 minutes.

## Create and assign API key generation role

An administrator is able to create a custom role for API key generation and assign that custom role to users. By default this parameter is not enabled for any of the System-created roles.

This task describes how an administrator can create and assign a custom role for API key generation.

1. Log in as an administrator to the Control Room.
2. Go to **Administration** > **Roles**.
3. Click **Create role . . .**
4. Scroll to the **API** section.
5. Select **Generate API-Key**.
6. Type a unique name in the **Role name** field.
7. Click **Create role**.
8. Go to **Administration** > **Users**, and assign the custom role you just created to non-admin users.
9. Log in as the user you assigned the **Generate API-Key** role to.
10. Under the user name, click **Generate API-Key**, and copy the **API-Key** to your clipboard.

Use the **API-Key** to log into an Control Room using SSO, or use the **API-Key** to log in a user without the user's password.

### Related tasks

#### [Authenticate with username and apiKey API](#)

Generate a JSON Web Token with your Control Room `username` and an `apikey`. This endpoint enables users to generate the token without the need for the user's password, such as for organizations that use single sign-on (SSO). By default, a token is valid for 20 minutes.

## Validate an authentication token API

Verify if a JSON Web Token is valid.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

1. Use the GET method and endpoint URL: `<your_control_room_url>/v1/authentication/token?token=<token>`.

---

**Note:** This endpoint does not have a request body; insert the token that you want to validate in the URL.

---

2. Send the request.

**Response body:**

The token is valid.

```
{
  "valid": true
}
```

The token is invalid.

```
{
  "valid": false
}
```

If the token is valid, you can use this endpoint to generate a fresh token that is valid for another 20 minutes: [Refresh a valid authentication token API](#).

If the token is not valid, you must generate a token using one of the authentication methods: [Authentication API](#)

**Related concepts**

[Authentication API](#)

Use the Authentication API to generate, refresh, and manage the JSON Web Tokens (JWTs) that are required for authentication and authorization in order to use the Control Room APIs.

## Refresh a valid authentication token API

Generate a JSON Web Token using a valid token. This endpoint provides you with a new token without the need to collect and authenticate credentials every time a token expires. By default, a token is valid for 20 minutes.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

Verify if a JSON Web Token is valid: [Validate an authentication token API](#).

1. Use the POST method and endpoint URL: <your\_control\_room\_url>/v1/authentication/token.

**Request body:**

```
{
  "token":
  "eyJhbGciOiJSUzUxMiJ9.eyJzdWIiOiIxIiwiaWF0IjoiY2xpZW50VHlwZSI6IldFQiIsImxpY2Vuc2VzIjpbXSwiY
iCO-vs--8b_pLG9XSUR0186uvXFopB75eVAaG-1l_AZhR78UE6Voi7_UggzHkLRrEpQ-
szR7cmFDpLxZ28xLnFJYhaIuMNdW9dWDVquBWTQSpYGNJd56D-
tFFHBodwVdNamqWHxaQebq1zMyUyQV6Q-gKdgubpT5gwuXnp-
BwScjHOYM3Fpj_nt0nEbJC5uWpJNtLQBpVzhsRwwlRKNOHQVbo6X7zkvKBoij8ewa5FWQwX7T-760BeqfssR
X5PcyCkrVJju2XqItQ9XMGNP7h_MaUDotU_CJyguPZA"
}
```

2. Send the request.

**Response body:** The response includes a new token with an updated expiration time.

```
{
  "token":
  "eyJhbGciOiJSUzUxMiJ9.eyJzdWIiOiIxIiwiaWF0IjoiY2xpZW50VHlwZSI6IldFQiIsImxpY2Vuc2VzIjpbXSwiY
GQ3T8fndjw",
  "user": {
    "id": 1,
    "email": "a@a.com",
    "username": "admin",
    "domain": null,
    "firstName": "",
    "lastName": "",
    "version": 1,
    "principalId": 1,
    "deleted": false,
    "roles": [
      {
        "name": "AAE_Admin",
        "id": 1,
        "version": 0
      }
    ],
    ". . ."
  ],
  "licenseFeatures": [],
  "emailVerified": true,
  "passwordSet": true,
  "questionsSet": true,
  "enableAutoLogin": false,
  "disabled": false,
  "clientRegistered": false,
  "description": "",
  "createdBy": 0,
  "createdOn": "2019-09-25T16:03:05-05:00",
  "updatedBy": 0,
  "updatedOn": "2019-09-25T16:03:05-05:00",
  "publicKey": null,
  "appType": null,
  "routingName": null,
  "appUrl": null
}
```

## Related concepts

### [Authentication API](#)

Use the Authentication API to generate, refresh, and manage the JSON Web Tokens (JWTs) that are required for authentication and authorization in order to use the Control Room APIs.

## Expire an authentication token API

Immediately log out the user and invalidate their JSON Web Token so that it cannot be used for authentication.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

1. Use the POST method and endpoint URL: `<your_control_room_url>/v1/authentication/logout`.

---

**Note:** This endpoint does not have a request body; insert the token that you want to expire in the request header.

---

2. Send the request.

**Response:** A 204 response code indicates that the request was successful.

## Related tasks

### [Authenticate with username and apiKey API](#)

Generate a JSON Web Token with your Control Room `username` and an `apikey`. This endpoint enables users to generate the token without the need for the user's password, such as for organizations that use single sign-on (SSO). By default, a token is valid for 20 minutes.

## Bot Scheduler APIs

Use the Bot Scheduler APIs to create, update, delete, and return details on scheduled automations.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

## Prerequisites

Ensure that you are allocated the following resources:

- **Schedule my bots to run** feature permission
- **Run and schedule** permissions for the folders that contain the bots.
- Access to the Bot Runner licensed users.
- Access to either a default device or a device pool

---

**Note:** If the user associated with the Bot Runner license has a default device assigned to their account, the bot deploys on that device. If no default device is assigned, or you want to select a different device, then you must specify a device pool.

---

## Create an automation schedule

1. [Authenticate the user](#)
2. [List files and folders by workspace API](#)
3. [List available unattended Bot Runners API](#)
4. **Optional:** [List device pools API](#)
5. [Schedule bot to run API](#)

## Schedule bot to run API

Schedule a bot to run on an unattended Bot Runner either one time or on a recurring basis.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).
- Ensure that you are allocated the following resources:
  - **View and Run my bots** feature permission
  - **Run and schedule** permissions for the folders that contain the bots
  - Access to Bot Runner licensed users
  - Access to either a default device or a device pool

**Note:** If the user associated with the Bot Runner license has a default device assigned to their account, the bot deploys on that device. If no default device is assigned, or you want to select a different device, then you must specify a device pool.

To schedule a bot, you provide the following information to the API:

Parameter	Required	Type	Description
fileId	Yes	Number	Identifier for the bot. <a href="#">List files and folders by workspace API</a>
runAsUserIds	Yes	Number	Identifier for a user that is registered with your Control Room as an Unattended bot runner. <a href="#">List available unattended Bot Runners API</a>
status	Yes	String	Indicates whether to create an active or draft schedule. Enter either <code>ACTIVE</code> or <code>DRAFT</code> .
poolIds	No	Number	Identifier of a device pool that has at least one active device.  <b>Note:</b> If the user associated with the Bot Runner license has a default device assigned to their account, the bot deploys on that device. If no default device is assigned, or you want to select a different device, then you must specify a device pool.  <a href="#">List device pools API</a>

1. Add the authentication token to the request header.

2. Use the POST method and endpoint URL: <control\_room\_url>/v1/schedule/automations.

**Request body:**

This example request body contains the required parameters to schedule a bot to run one time.

```
{
  "name": "UpdateInventory.20.12.16.10.40.48",
  "fileId": "14277",
  "poolIds": [
    "27"
  ],
  "timeZone": "Asia/Calcutta",
  "runAsUserIds": [
    "472",
    "480",
    "80"
  ],
  "startDate": "2020-12-16",
  "startTime": "15:00",
  "scheduleType": "NONE",
  "status": "ACTIVE"
}
```

This example request body contains the required parameters to schedule a bot to run on a recurring basis.

```
{
  "name": "UpdateInventory.20.12.16.10.40.48",
  "fileId": "14277",
  "poolIds": [
    "27"
  ],
  "timeZone": "Australia/Melbourne",
  "runAsUserIds": [
    "1103",
    "36",
    "80"
  ],
  "startDate": "2020-12-16",
  "repeatOccurrence": {
    "endTime": "23:59",
    "runEvery": "1",
    "timeUnit": "HOURS"
  },
  "repeatEnabled": true,
  "endDate": "2020-12-24",
  "startTime": "20:45",
  "weeklyRecurrence": {
    "interval": "1",
    "daysOfWeek": [
      "TUE",
      "THU",
      "FRI"
    ]
  }
},
  "scheduleType": "WEEKLY",
  "status": "ACTIVE"
}
```

**3. Send the request.**

**Response body:** The two example responses include the following information about the automation:

- **id:** the numerical value that identifies the automation. Use this parameter in the `Update automations` or `Delete automations` APIs.
- **zonedNextRunDateTime:** the date and time of the next time the bot is scheduled to run.

This is an example response for a bot scheduled to run one time.

```
{
  "id": "989",
  "name": "UpdateInventory.20.12.16.10.40.48",
  "fileId": "14277",
  "status": "ACTIVE",
  "deviceIds": [],
  "description": "",
  "rdpEnabled": false,
  "scheduleType": "NONE",
  "timeZone": "Asia/Calcutta",
  "startDate": "2021-12-16",
  "endDate": "",
  "startTime": "15:00",
  "repeatEnabled": false,
  "zonedNextRunDateTime": "2021-12-16T09:30:00Z",
  "createdBy": "1103",
  "createdOn": "2021-01-11T18:57:18.932407Z",
  "updatedBy": "1103",
  "updatedOn": "2021-01-11T18:57:18.932422Z",
  "tenantId": "1",
  "fileName": "appsheet",
  "filePath": "Automation Anywhere\\Bots\\appsheet",
  "runAsUserIds": [
    "480",
    "80",
    "472"
  ],
  "botInput": {},
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "poolId": [
    "11"
  ],
  "overrideDefaultDevice": false,
  "runElevated": false
}
```

This is an example response for a bot scheduled to run on a recurring basis.

```
{
  "id": "990",
  "name": "UpdateInventory.20.12.16.10.40.48",
  "fileId": "14277",
  "status": "ACTIVE",
  "deviceIds": [],
  "description": "",
  "rdpEnabled": false,
  "scheduleType": "WEEKLY",
  "weeklyRecurrence": {
    "interval": 1,
    "daysOfWeek": [
      "TUE",
      "THU",
    ]
  }
}
```

```

        "FRI"
    ]
  },
  "timeZone": "Australia/Melbourne",
  "startDate": "2021-01-16",
  "endDate": "2021-12-24",
  "startTime": "20:45",
  "repeatEnabled": true,
  "repeatOccurrence": {
    "runEvery": "1",
    "timeUnit": "HOURS",
    "endTime": "23:59"
  },
  "zonedNextRunDateTime": "2021-01-19T09:45:00Z",
  "createdBy": "1103",
  "createdOn": "2021-01-11T18:59:31.182663Z",
  "updatedBy": "1103",
  "updatedOn": "2021-01-11T18:59:31.182669Z",
  "tenantId": "1",
  "fileName": "a_trigger",
  "filePath": "Automation Anywhere\\Bots\\a_trigger",
  "runAsUserIds": [
    "80",
    "36",
    "1103"
  ],
  "botInput": {},
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "poolId": [
    "7"
  ],
  "overrideDefaultDevice": false,
  "runElevated": false
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

Use the [List automation schedules API](#) to retrieve details on all the scheduled automations.

## List automation schedules API

Retrieve details of the automation schedules that you have permissions to view.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must be assigned a role that includes the View and manage all scheduled activity from my Folders permission.

In this example, you list all the scheduled automations sorted by the next run date and time.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: <control\_room\_url>/v1/schedule/automations/list.

### Request body:

```
{
```

```

    "sort": [
      {
        "field": "zonedNextRunDateTime",
        "direction": "asc"
      }
    ]
  }
}

```

### 3. Send the request.

**Response body:** The response includes the following data about each automation:

- **id:** the numerical value that identifies the automation. Use this parameter in the `Update automations` or `Delete automations` APIs.
- **status:** returns whether the scheduled automation is `ACTIVE` or `INACTIVE`.

```

{
  "page": {
    "offset": 0,
    "total": 3,
    "totalFilter": 3
  },
  "list": [
    {
      "id": "661",
      "name": "eodReport_28.20.10.12.23.02.48",
      "fileId": "6598",
      "status": "ACTIVE",
      "deviceIds": [],
      "description": "",
      "rdpEnabled": false,
      "scheduleType": "DAILY",
      "dailyRecurrence": {
        "interval": 3
      },
      "timeZone": "America/Los_Angeles",
      "startDate": "2020-10-12",
      "endDate": "",
      "startTime": "23:30",
      "repeatEnabled": true,
      "repeatOccurrence": {
        "runEvery": "3",
        "timeUnit": "HOURS",
        "endTime": "23:59"
      },
      "zonedNextRunDateTime": "2021-01-14T07:30:00Z",
      "createdBy": "251",
      "createdOn": "2020-10-13T06:01:51.992433Z",
      "updatedBy": "251",
      "updatedOn": "2021-01-11T07:30:00.082057Z",
      "tenantId": "1",
      "fileName": "wlm_28",
      "filePath": "Automation Anywhere\\Bots\\West Coast",
      "runAsUserIds": [
        "251"
      ],
      "botInput": {},
      "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
      "poolId": [
        "23"
      ],
      "overrideDefaultDevice": false,
      "runElevated": false
    }
  ]
}

```

```

    },
    {
      "id": "990",
      "name": "accounts.20.12.16.10.51.59",
      "fileId": "12501",
      "status": "ACTIVE",
      "deviceIds": [],
      "description": "",
      "rdpEnabled": false,
      "scheduleType": "WEEKLY",
      "weeklyRecurrence": {
        "interval": 1,
        "daysOfWeek": [
          "TUE",
          "THU",
          "FRI"
        ]
      },
      "timeZone": "Australia/Melbourne",
      "startDate": "2021-01-16",
      "endDate": "2021-12-24",
      "startTime": "20:45",
      "repeatEnabled": true,
      "repeatOccurrence": {
        "runEvery": "1",
        "timeUnit": "HOURS",
        "endTime": "23:59"
      },
      "zonedNextRunDateTime": "2021-01-19T09:45:00Z",
      "createdBy": "1103",
      "createdOn": "2021-01-11T18:59:31.182663Z",
      "updatedBy": "1103",
      "updatedOn": "2021-01-11T18:59:31.182669Z",
      "tenantId": "1",
      "fileName": "a_trigger",
      "filePath": "Automation Anywhere\\Bots\\APAC",
      "runAsUserIds": [
        "80",
        "36",
        "1103"
      ],
      "botInput": {},
      "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
      "poolId": [
        "7"
      ],
      "overrideDefaultDevice": false,
      "runElevated": false
    },
    {
      "id": "989",
      "name": "UpdateInventory.20.12.16.10.40.48",
      "fileId": "11201",
      "status": "ACTIVE",
      "deviceIds": [],
      "description": "",
      "rdpEnabled": false,
      "scheduleType": "NONE",
      "timeZone": "Asia/Calcutta",
      "startDate": "2021-12-16",
      "endDate": "",
      "startTime": "15:00",
      "repeatEnabled": false,
      "zonedNextRunDateTime": "2021-12-16T09:30:00Z",
    }
  ],
  "tenantId": "1",
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "poolId": [
    "7"
  ],
  "overrideDefaultDevice": false,
  "runElevated": false
}

```

```

    "createdBy": "1103",
    "createdOn": "2021-01-11T18:57:18.932407Z",
    "updatedBy": "1103",
    "updatedOn": "2021-01-11T18:57:18.932422Z",
    "tenantId": "1",
    "fileName": "appsheet",
    "filePath": "Automation Anywhere\\Bots\\spreadsheets",
    "runAsUserIds": [
      "480",
      "80",
      "472"
    ],
    "botInput": {},
    "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
    "poolId": [
      "11"
    ],
    "overrideDefaultDevice": false,
    "runElevated": false
  }
]
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Bot Execution Orchestrator API

As a Control Room administrator or a user with **View and Manage Scheduled Activity** permission, you can monitor the bot progress using a set of Control Room APIs.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### High-level process for monitoring bots

#### Searchable fields for devices:

- **hostName:** The host name of the device configured as a Bot Runner. If a naming convention is used for host names, searching on a unique **substring** in the host name is an effective way to identify Bot Runner devices.
- **userId:** The unique numeric identification for a specific user also identifies the Bot Runner device. Unique user naming conventions can be used to identify users and devices that are licensed and configured as Bot Runners.

#### Searchable fields for bots:

- **name:** The unique name of a bot. You can search on the exact name (**eq**) or a text string (**substring**) that is contained in the bots name.
- **path:** The relative path of a folder in the Control Room. You can search on a full path or a **substring** contained in the path.

## Request device details

Use this API to retrieve a list of devices that are available for bot deployment.

### Roles and license

You have to authenticate as a user with an **Unattended bot runner license**.

- **URL:**

```
http://<your_control_room_url>/v2/devices/list
```

- **Method: POST**

### Supported filterable parameters:

#### id

The numeric identifier for a device.

- **Field:** id
- **Type:** integer

```
{
  "filter": {
    "operator": "eq",
    "value": "7",
    "field": "id"
  }
}
```

#### hostName

The name of the registered device.

- **Field:** hostName
- **Type:** string

```
{
  "filter": {
    "operator": "substring",
    "value": "AA",
    "field": "hostName"
  }
}
```

#### userId

A unique numeric identifier for the user associated with the registered device.

- **Field:** userId
- **Type:** long

```
{
  "filter": {
    "operator": "eq",
    "value": "13",
    "field": "userId"
  }
}
```

#### status

The connection status of device.

- **Field:** status
- **Type:** string

```
{
  "filter": {
    "operator": "eq",
    "value": "CONNECTED",
    "field": "status"
  }
}
```

This task requests a list of all devices with a specific string in the hostname parameter and specific status of the device. Use the list in the response to identify which devices are connected and available to run bots.

1. Use the **POST** method to generate an authentication JSON Web Token. Add the generated authentication token to the request header.

*Authentication API*

2. Select the **POST** method.
3. Enter the URL for the API:

```
https://<your_control_room_url>/v2/devices/list
```

4. In the request body, add the filtering, sorting, and pagination rules to retrieve the device list that you want to deploy.

---

**Note:** The `fields` array filter parameter in the request body is currently not supported. When you send the field name in the request body to restrict the number of fields in the response, it does not work as expected and instead returns all the fields.

---

For example, this request body uses "and" as `operator` and the device "status" and "hostname" as `field` to filter the required results. The results will be sorted in "descending" order based on "status".

```
{
  "sort": [
    {
      "field": "status",
      "direction": "desc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "eq",
        "value": "CONNECTED",
        "field": "status"
      },
      {
        "operator": "substring",
        "value": "win",
        "field": "hostName"
      }
    ]
  },
  "fields": [
  ],
  "page": {
```

```

    "offset": 0,
    "total": 71,
    "totalFilter": 18,
    "length": 100
  }
}

```

##### 5. Send the request.

- In a REST client, click **SEND**.
- In the Swagger interface, click **Execute**.

##### Response body:

The response returns the details of two devices that are in the "connected" status and for which the `hostName` starts with "win" based on the requested filter criteria.

```

{
  "page": {
    "offset": 0,
    "total": 71,
    "totalFilter": 7
  },
  "list": [{
    "id": "163",
    "type": "ATTENDED_BOT_RUNNER",
    "hostName": "winwlm-2",
    "userId": "",
    "userName": "",
    "status": "CONNECTED",
    "poolName": "",
    "fullyQualifiedHostName": "-",
    "updatedBy": "b2",
    "updatedOn": "2020-07-07T08:24:56.091061Z",
    "botAgentVersion": "12.1"
  }, {
    "id": "162",
    "type": "ATTENDED_BOT_RUNNER",
    "hostName": "winwlm-1",
    "userId": "",
    "userName": "",
    "status": "CONNECTED",
    "poolName": "",
    "fullyQualifiedHostName": "-",
    "updatedBy": "b1",
    "updatedOn": "2020-07-07T08:24:55.982047Z",
    "botAgentVersion": "12.1"
  }
}

```

You can use the device IDs received in the response to deploy the bots on Bot Runners.

## Request bot deployment status API

When you deploy a bot you might want to verify the status of the bot deployment. This API enables you to know the deployment status of the bot you deployed.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You require the **deploymentID** to track the deployment status of a specific bot. This is the output of the [Deploy bots API](#).

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/activity/list

**Request body:**

```
{
  "filter": {
    "operator": "eq",
    "field": "deploymentId",
    "value": "14c2b6f8-c2a0-4a57-959d-ef413df0d179"
  }
}
```

3. Send the request.

**Response body:** In a successful request, this endpoint returns one of the following deployment **status**: COMPLETED, UNKNOWN, DEPLOYED, RUNNING, RUN\_PAUSED, UPDATE, RUN\_FAILED, RUN\_ABORTED, RUN\_TIMED\_OUT, DEPLOY\_FAILED, PENDING\_EXECUTION, QUEUED, BOT\_PRE\_PROCESSING\_SUCCESSFUL, or BOT\_PRE\_PROCESSING\_FAILED.

```
{
  "page": {
    "offset": 0,
    "total": 13,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "e49cea73-01fb-4a10-a7de-
ce3e7b83a5ae_0e6c0971292ea185",
      "automationName": "deploy-test_20.05.01.17.08.35_jdoe_API",
      "fileName": "deploy-test",
      "filePath": "Automation Anywhere\\Bots\\deploytest\\deploy-
test",
      "type": "TASK",
      "startDateTime": "2020-05-01T17:09:02Z",
      "endDateTime": "2020-05-01T17:09:05Z",
      "command": "",
      "status": "COMPLETED",
      "progress": 100,
      "automationId": "22260",
      "userId": "2538",
      "deviceId": "894",
      "currentLine": 1,
      "totalLines": 1,
      "fileId": "57911",
      "modifiedBy": "2540",
      "createdBy": "2538",
      "modifiedOn": "2020-05-01T17:08:47.657801Z",
      "createdOn": "2020-05-01T17:08:38.228573Z",
      "deploymentId": "14c2b6f8-c2a0-4a57-959d-ef413df0d179",
      "queueName": "",
      "queueId": "",
      "usingRdp": false,
      "message": "",
      "canManage": false,
      "deviceName": "MyCompany-JohnDoe",
      "userName": "jdoe"
    }
  ]
}
```

```

    }
  ]
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Bot Insight API

Users with the `AAE_Bot_Insight_Admin` or `AAE_Admin` role and the `Bot_Insight` license can access the Bot Insight API to retrieve business and operations data.

Automation Anywhere bots are built, run, and monitored in the Control Room. Bot Insight accesses real-time business insights and digital workforce performance data to use content-level productivity data from the bots that are deployed.

### Business data

The Business data endpoints return Bot Insight data retrieved from deployed bots.

- [Delete task log data](#)

Delete the business data that is logged in the Bot Insight database on a deployed bot.

```
DELETE /v2/botinsight/data/api/deletetasklogdata
```

- [Get bot variables data](#)

Retrieve information about the variables in deployed bots, such as the variable name, data type, minimum value, and maximum value.

```
GET /v2/botinsight/data/api/gettaskvariableprofile
```

- [Get task log data](#)

Retrieve the analytical variables data that was logged during a bot run.

```
GET /v2/botinsight/data/api/gettasklogdata
```

### Operations data

The Operations data endpoints return information about bots that were deployed to Bot Runner devices. You can use this information to enhance productivity and take measures based on real-time information for RPA deployments.

- [Get audit trail data](#)

Retrieve information about Control Room events.

```
GET /v2/botinsight/data/api/getaudittraildata
```

- [Get bot run data](#)

Retrieve information about a bot run, such as the server on which it was run and whether it ran successfully or encountered an error.

```
GET /v2/botinsight/data/api/getbotrundata
```

## Delete task log data

Delete the business data that is logged in the Bot Insight database on a deployed bot.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must have the **AAE\_Bot Insight Admin** role and the Bot Insight license.

To delete data from the Bot Insight database, you provide the following information to the API in the request body:

Parameter	Required	Type	Description
botname	yes	string	Name of the bot for which you retrieve data
repositorypath	yes	string	Control Room repository path of the bot
environment	yes	string	Specifies the environment: DEV or PROD
runId	no	string	ID number that is generated when the bot runs. Use the get task log data to retrieve the runId: <a href="#">Get task log data</a> .
fromDate	no	date	Start date of the period for which to retrieve the data  Format: yyyy-mm-ddThh:mm:ss  If you do not provide this parameter, the API will return all available data.  <b>Note:</b> Do not provide this parameter if you provide the runId parameter.
toDate	no	date	End date of the period for which to retrieve the data  • Format: yyyy-mm-ddThh:mm:ss • Default: current date  <b>Note:</b> Do not provide this parameter if you provide the runId parameter.

1. Add the authentication token to the request header.

2. Use the DELETE method and endpoint URL:<control\_room\_url>/v2/botinsight/data/api/deletetasklogdata

**Request body:**

```
{
  "botName": "AnalyticsMortgageProcessing",
  "runId": "a4e706f2-6806-49eb-8d8f-4b915f9a67b0_aaa8b68b1ef888a0",
  "repositoryPath": "repository:///Automation%20Anywhere/Bots/
  folder8092/AnalyticsMortgageProcessing?fileId=40642&workspace=PRIVATE",
  "environment": "Prod"
}
```

3. Send the request.

**Response body:** This example response returns the one thousand rows of data that were deleted.

```
{
  "botName": "AnalyticsMortgageProcessing",
  "repositoryPath": "repository:///Automation%20Anywhere/Bots/
  folder8092/AnalyticsMortgageProcessing?fileId=40642&workspace=PRIVATE",
  "deleteCount": 1000
}
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Get task log data

Retrieve the analytical variables data that was logged during a bot run.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must have the **AAE\_Bot Insight Admin** role and the Bot Insight license.

To retrieve business data on a specific bot, you provide the following query parameters to the API:

Parameter	Required	Type	Description
botname	no	string	Name of the bots for which you retrieve data Enter up to 10 bot names and separate each name with a comma. If you do not provide this parameter, the API will return data on all the bots.
pageno	no	integer	Page number from which to retrieve the data

Parameter	Required	Type	Description
limit	no	integer	<p>Specifies the number of parts in which the information is retrieved</p> <p>For example, if you specify the limit as 2500 to retrieve a total of 10000 records, then the information retrieved is as follows:</p> <ul style="list-style-type: none"> <li>• 0 page returns 1 - 2500</li> <li>• 1st page returns 2501 - 5000</li> <li>• 2nd page returns 5001 - 7500</li> <li>• 3rd page returns 7501 - 10000</li> <li>• Min value: 1</li> </ul>
fromDate	no	date	<p>Start date of the period for which to retrieve the data</p> <p>If you do not provide this parameter, the API will return all available data.</p> <p>Format: <code>yyyy-mm-ddThh:mm:ss</code>.</p>
toDate	no	date	<p>End date of the period for which to retrieve the data</p> <ul style="list-style-type: none"> <li>• Format: <code>yyyy-mm-ddThh:mm:ss</code></li> <li>• Default: current date</li> </ul>

1. Add the authentication token to the request header.
2. Use the GET method and endpoint URL: `<control_room_URL>/v2/botinsight/data/api/gettasklogdata?botname=ATMReconciliation`

The URL includes the example query parameter `botname`. For large datasets, we recommend you use the `pageno` and `limit` parameters to avoid a timeout error.

3. Send the request.

**Response body:** This response example contains data on the ATMReconciliation bot and the first record returned. To keep this block of code short, the remaining 22 records are omitted. The response includes the following output parameters:

Parameter	Description	Type
runId	<p>Identifier for the bot run that retrieved this data</p> <p>All the transactions in a single run have a common runId.</p>	string
transactionId	Identifier for the data set that was retrieved in a single loop iteration	string
dateLogged	<p>Date and time on which the bot retrieved the data</p> <p>Format: <code>yyyy-mm-ddThh:mm:ss</code></p>	date

Parameter	Description	Type
variables	Variable names and values	dictionary of strings and numbers

```
{
  "businessData": [
    {
      "totalRecords": 23,
      "count": 23,
      "pageNo": 1,
      "botId": "PROD_12",
      "botName": "ATMReconciliation",
      "repositoryPath": "repository:///Automation%20Anywhere/Bots/
folder_6809/ATMReconciliation?fileId=19163&workspace=PRIVATE",
      "list": [
        {
          "transactionName": "block1",
          "transactions": [
            {
              "runId": "a2b0a033-3aa6-43b0-a2c7-
da2c21a9f593_5151d69b5cb3ddf1",
              "transactionId": "8567aa95-3b5b-4092-a0a9-
fc94302c32fb",
              "dateLogged": "2020-10-16T08:05:04",
              "variables": {
                "bank_name": "TechCU",
                "status": "Not Matched",
                "date": "1477267200000",
                "colour_code": "Yellow",
                "card_type": "diners-club-enroute",
                "amount": "210.0",
                "state_code": "NJ",
                "transaction_type": "Deposit",
                "zip_code": "7104",
                "country_code": "US",
                "reason": "Need Attention"
              }
            }
          ]
        }
      ],
      // The remaining 22 records are omitted from this code example.
    }
  ]
}
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Get Bot Insight bot run data

Retrieve information about a bot run, such as the server on which it was run and whether it ran successfully or encountered an error.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must have the **AAE\_Bot Insight Admin** or **AAE\_Admin** role and the Bot Insight license.

To retrieve information about a bot run, you provide the following query parameters to the API:

Parameter	Required	Type	Description
pageno	no	integer	Page number from which to retrieve the data
limit	no	integer	Specifies the number of parts in which the information is retrieved  For example, if you specify the limit as 2500 to retrieve a total of 10000 records, then the information retrieved is as follows: <ul style="list-style-type: none"> <li>• 0 page returns 1 - 2500</li> <li>• 1st page returns 2501 - 5000</li> <li>• 2nd page returns 5001 - 7500</li> <li>• 3rd page returns 7501 - 10000</li> </ul>
fromDate	no	date	Start date of the period for which to retrieve the data  If you do not provide this parameter, the API will return all available data.  Format: yyyy-mm-ddThh:mm:ss
toDate	no	date	End date of the period for which to retrieve the data <ul style="list-style-type: none"> <li>• Format: yyyy-mm-ddThh:mm:ss</li> <li>• Default: current date</li> </ul>

1. Add the authentication token to the request header.
2. Use the GET method and endpoint URL:<control\_room\_URL>/v2/botinsight/data/api/getbotrundata
3. Send the request.

**Response body:**

```
{
  "totalRecords": 10000,
  "botRunDataList": [
    {
      "id": 8009,
      "userName": "usecase_14",
      "hostName": "usecase-botagen",
      "fileName": "ImageScrapperBot",
      "fileType": "TASK",
      "startDate": "2020-09-06T18:32:27Z",
      "endDate": "2020-09-06T18:35:21Z",
      "status": "COMPLETED",
      "totalLines": 75,
      "currentLine": 75,
      "timeTaken": 176607.0,
      "progress": 100
    },
    // The remaining data is omitted from this code example.
  ]
}
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Get Bot Insight audit trail data

Retrieve information about Control Room events.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Use the `Authentication API` to generate a JSON Web Token. See [Authentication API](#).
- You must have the **AAE\_Admin** role or a custom role with the `View everyone's audit log actions` permission.

To retrieve information about Control Room events, you provide the following query parameters to the API:

Parameter	Required	Type	Description
<code>pageno</code>	no	integer	Page number from which to retrieve the data
<code>limit</code>	no	integer	Specifies the number of parts in which the information is retrieved  For example, if you specify the limit as 2500 to retrieve a total of 10000 records, then the information retrieved is as follows: <ul style="list-style-type: none"> <li>• 0 page returns 1 - 2500</li> <li>• 1st page returns 2501 - 5000</li> <li>• 2nd page returns 5001 - 7500</li> <li>• 3rd page returns 7501 - 10000</li> </ul>
<code>fromDate</code>	no	date	Start date of the period for which to retrieve the data  If you do not provide this parameter, the API will return all available data.  Format: <code>yyyy-mm-ddThh:mm:ss</code>
<code>toDate</code>	no	date	End date of the period for which to retrieve the data.  <ul style="list-style-type: none"> <li>• Format: <code>yyyy-mm-ddThh:mm:ss</code></li> <li>• Default: current date</li> </ul>

1. Add the authentication token to the request header.
2. Use the GET method and endpoint URL: `<control_room_URL>/v2/botinsight/data/api/getaudittraildata`
3. Send the request.

### Response body:

```
{
  "totalRecords": 10000,
  "auditTrailDataList": [
    {
      "activityType": "BI_LOAD_DASHBOARD",
      "createdBy": 1121,
      "createdOn": "2021-01-11T11:15:06Z",
```

```

    "detail": {},
    "environmentName": "DEV",
    "eventDescription": "BI Load Dashboard",
    "hostName": "192.xxx.xxx.xxx",
    "id": "AnalyticsMortgageProcessing",
    "objectName": "N/A",
    "requestId": "f36e040e-02a6-4fae-8415-9ff57067b7a3",
    "source": "Bot Insight",
    "status": "Successful",
    "userName": "ram"
  },
  // The remaining data is omitted from this code example.

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Get bot variables data

Retrieve information about the variables in deployed bots, such as the variable name, data type, minimum value, and maximum value.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must have the **AAE\_Bot Insight Admin** role and the [Bot Insight](#) license.

To retrieve information about the variables in a deployed bot, you provide the following query parameters to the API:

Parameter	Required	Type	Description
botname	no	string	Name of the bot for which data is retrieved
repositorypath	no	string	Control Room repository path of the bot

1. Add the authentication token to the request header.
2. Use the GET method and endpoint URL:<control\_room\_URL>/v2/botinsight/data/api/gettaskvariableprofile
3. Send the request.

**Response body:** This response example contains data on the AnalyticsMortgageProcessing bot and the first record returned. To keep this block of code short, the remaining data is omitted.

```

{
  "dataProfiles": [
    {
      "botId": "PROD_40642",
      "botName": "AnalyticsMortgageProcessing",
      "standardDashboardName": "",
      "profileVariables": [
        {
          "variableName": "state",
          "displayName": "State",
          "attributeType": "US_STATE_CODE",
          "sumOfValue": 0.0,
          "minimumValue": "",
          "maximumValue": "",

```

```

        "averageOfValues": 0.0,
        "totalDistinct": "53",
        "enabled": "Y",
        "isTransactionVariable": ""
    },
    // The remaining data is omitted from this code example.

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Bot Lifecycle Management API

Use the Bot Lifecycle Management API to export and import bots with dependent files and command packages for comprehensive automation lifecycle management. Users can export bots from public workspace and import to a private workspace in another Control Room and check into a public workspace.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### Overview

You can use the Control Room Export and Import REST API to manage your automation TaskBots, including dependent files in different environments such as development, testing, and production based on your organization's automation requirements.

For example, you can move bots that are verified as production-ready from test to production.

### Import 11.x bots in Automation 360 for migration

The BLM import feature also support to import your 11.x bots from 11.x Control Room instance to Automation 360. This enables you to consolidate the 11.x bots from multiple Control Room repository in a single Automation 360 repository.

### Permissions required to move bots

To export bots from the Control Room, you must have the following permissions:

- **Export bot** and **View packages** feature permissions
- **Check in** or **Check out** folder permissions

To import bots to the Control Room, you must have the following permissions:

- **Import bot** and **Manage package** feature permissions
- **Check in** folder permission
- Bot Creator license

## Moving a bot

To move a bot from one environment to another, follow these steps:

1. Use the Export API to export the bot from the Control Room in the source environment.  
*[Export files using API](#)*
2. Use the Import API to import the bot into the Control Room in the destination environment.  
*[Import files using API](#)*

### Related concepts

#### [Bot Lifecycle Management](#)

The Automation Anywhere Bot Lifecycle Management (BLM) feature enables you to move a bot from one environment to another. For example, you can move a bot from the development or testing environment to the production environment.

## Export files using API

You can export bots with their dependent files using the Export API.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- You must have Export bots, View package, and Check in or Check out permissions to the required folders.
- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- A file ID of the bot you want to export from the public folder.

*[List files and folders by workspace API](#)*

---

**Note:** Users can only view the folders and subfolders they have permissions to access.

---

- The following API URLs:
  - `https://<your_control_room_url>/v2/blm/export`: To export repository bots
  - `https://<your_control_room_url>/v2/blm/status/{requestId}`: To get export status by request ID
  - `https://<your_control_room_url>/v2/blm/download/{downloadFileId}`: To download the exported bot

1. Add the authentication token to the request header.
2. Search for one or more file IDs of the bot you want to export.
3. Use the POST method and endpoint URL: `https://<your_control_room_url>/v2/blm/export`.

The following example request body, exports the bot with `fileId` 2197 along with the packages required for bot.

#### Request body:

```
{
  "name": "export-docs",
  "fileIds": [
    2197
  ],
  "includePackages": true
}
```

```
}

```

- Send the request.  
The following response body returns the `requestId`.

**Response body:**

```
{
  "requestId": "987c0de3-b158-4e71-975e-27d10b9a83fb"
}
```

- Use the GET method and endpoint URL: `<your_control_room_url>/v2/blm/status/{requestId}`  
Enter the `requestId` generated in Step 4 to know the status of export.

```
https://192.0.2.0/v2/blm/status/987c0de3-b158-4e71-975e-27d10b9a83fb
```

- Send the request.  
The following response body returns the `status` and `downloadFileId`.

**Response body:**

```
{
  "requestId": "987c0de3-b158-4e71-975e-27d10b9a83fb",
  "type": "EXPORT",
  "status": "COMPLETED",
  "downloadFileName": "export-docs",
  "downloadFileId": "ZXhwb3J0LWRvY3M=",
  "errorMessage": ""
}
```

- Use the GET method and endpoint URL: `<your_control_room_url>/v2/blm/download/{downloadFileId}`  
Enter the `downloadFileId` generated in Step 6.

```
https://192.0.2.0/v2/blm/download/ZXhwb3J0LWRvY3M=
```

- Send the request.  
The dialog box appears. Browse the path and save the exported package in zip file format.  
The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

Import the exported file in the private folder of the target Control Room.

**Related tasks**[Export bots](#)

You can export a bot from one Control Room to another.

## Import files using API

You can import bots with their dependent files using the Import API.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- You must have following permissions and licenses:
  - Import bots
  - Manage package
  - Check in permissions to the necessary folders to import bots in the public workspace
  - Bot Creator license to import bots in the private workspace
- Use the `Authentication API` to generate a JSON Web Token. See [Authentication API](#).
- The following API URLs:
  - `https://<your_control_room_url>/v2/blm/import`: To import repository bot
  - `https://<your_control_room_url>/v2/blm/status/{requestId}`: To get import status by request ID
- To import the 11.x bots into your Control Room, you must have the required `aapkg` package that you created using the BLM Export API in the 11.x Control Room instance.

The `aapkg` package must be present in the same Automation 360 machine where you want to import the 11.x bots.

You can import the password-protected `aapkg` packages using the Import API only.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: `https://<your_control_room_url>/v2/blm/import`.

Provide the following parameters for the request header.

- `upload`: Choose the required zip file that you want to import in your Control Room.  
Choose the required `aapkg` file to import 11.x bots to your Control Room.
- `actionIfExists`: Select either the `SKIP` or `OVERWRITE` option if the file you are importing already exists.
- `publicWorkspace`: This is a Boolean value. Select either `true` or `false`. Enter `true` if you want to import the file to the public workspace.

3. Send the request.  
The following response body returns `requestId`.

**Response body:**

```
{
  "requestId": "eafef543-2d7a-47f5-81d0-490d09dd68d2"
}
```

4. Use the GET method and endpoint URL: `<your_control_room_url>/v2/blm/status/{requestId}`  
Enter the `requestId` generated in Step 3 to know the status of import.

5. Send the request.  
The following response body returns the `status`.

**Response body:**

```
{
  "requestId": "fa4b0c56-fab8-42ef-8d96-fc6b53e1cbaa",
  "type": "IMPORT",
  "status": "COMPLETED",
  "downloadFileName": "",
  "downloadFileId": "",
  "errorMessage": ""
}
```

```
}

```

The `COMPLETED` status indicates that the file is successfully imported. You can find the imported file in your Control Room

### 11.x bots migration:

- a. The 11.x bots are imported in the **Bots > My Tasks** folder or **Bots > My Metabots** folder in the `.atmx` or `.mbot` file format.
- b. Use the migration wizard to convert the 11.x bots files into the `.bot` format that is supported in Automation 360.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Related tasks

### Import bots

You can import bots with their dependencies from one Control Room to another. The source environment can be either an Automation 360 Control Room or a 11.x Control Room instance.

## Credential Vault APIs

As an Control Room user with **Manage my credentials and lockers** feature permissions, you have the option to use the Credential Vault API to manage your attributes, credentials, and lockers in the Control Room.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

By default, all users can create credentials. You are the Credential owner of any credentials that you created. As a Credential owner, you can update, delete, and transfer the ownership of your credentials.

## Configure the Credential Vault for your organization

As a Locker admin, configure a locker and a credential, then assign the credential to the locker. It is also acceptable to first configure a credential, then a locker.

1. [Authenticate the user](#).  
Use the POST method to generate an authentication JSON Web Token.
2. [Configure a locker using API](#)
3. [Configure a credential with attribute values using API](#)
4. [Assign credential to locker API](#)

## Manage your credentials

Authenticate yourself as a basic user to retrieve the list of credentials that you have access to then assign a value to a specific attribute.

1. [Authenticate the user](#).  
Use the POST method to generate an authentication JSON Web Token.

2. [List credentials using API](#)
3. [Assign value to attribute using API](#)

## Set device login credentials API

Use the login setting endpoint of the Credential Vault API to programmatically update the username and password for a device.

---

**Note:** You can view the [login setting endpoint](#) in the [API Reference](#), but API functionality is limited. You need a licensed [Enterprise Edition](#) to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You can use this endpoint to set or update the login credentials for your own device without additional permissions.

To set or update the login credentials on other users' devices, for example, to deploy bots on unattended Bot Runners, you must have the `AAE_admin` role or a custom role with the `Bot Auto-Login Credentials API` permission.

1. Use the PUT method and endpoint URL: `<control_room_URL>/v2/credentialvault/loginsetting`.

### Request body:

---

**Note:** If the username includes a domain, use a double backslash between the domain and user.

---

```
{
  "loginUsername": "aai\\katherine.johnson",
  "loginPassword": "{{password}}"
}
```

2. Send the request.

### Response body:

```
"Credentials updated for katherine"
```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Configure a locker using API

Use a combination of endpoints to create a locker and assign locker access permissions to users.

---

**Note:** You can view the [locker endpoints](#) in the [API Reference](#), but API functionality is limited. You need a licensed [Enterprise Edition](#) to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must be assigned the **AAE\_Admin**, **AAE\_Locker Admin** role or have a custom role that includes the `Manage my lockers` permission.

You will provide the role ID to assign consumer access to users [Search for roles API](#).

1. Add the authentication token to the request header.

2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/credentialvault/lockers to create the locker.

**Request body:**

```
{
  "name": "HumanResourcesCredentials",
  "description": "Login credentials for the HR dept"
}
```

3. Send the request.

**Response body:** In a successful request, this endpoint returns the `id`, which is a unique numeric identifier for the locker. Use the locker ID in subsequent API requests, such as to add consumers or credentials to the locker.

```
{
  "id": "1551",
  "name": "HumanResourcesCredentials",
  "description": "Login credentials for the HR dept",
  "createdBy": "1508",
  "createdOn": "2020-12-28T22:24:40.462253Z",
  "updatedBy": "1508",
  "updatedOn": "2020-12-28T22:24:40.462259Z",
  "version": "0"
}
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

Assign locker access permissions to users. [Locker permissions](#)

4. Optional: Assign another locker owner. Use the PUT method and endpoint URL: <your\_control\_room\_url>/v2/credentialvault/lockers/{lockerId}/members/{userId}.

---

**Note:** The locker creator is automatically assigned the locker owner permission.

---

**Request body:**

```
{
  "permissions": [
    "own"
  ]
}
```

5. Send the request.

**Response body:** This endpoint does not return data.

6. Optional: Assign a locker manager. Use the PUT method and endpoint URL: <your\_control\_room\_url>/v2/credentialvault/lockers/{lockerId}/members/{userId}.

**Request body:**

```
{
  "permissions": [
    "manage"
  ]
}
```

7. Send the request.

**Response body:** This endpoint does not return data.

**8. Optional: Assign a locker participant. Use the PUT method and endpoint**

URL:<your\_control\_room\_url>/v2/credentialvault/lockers/{lockerId}/members/{userId}.

**Request body:**

```
{
  "permissions": [
    "participate"
  ]
}
```

**9. Send the request.**

**Response body:** This endpoint does not return data.

**10. Assign locker consumers. Use the POST method and endpoint URL:: <your\_control\_room\_url>/v2/credentialvault/lockers/{lockerId}/consumers**

**Request body:** Provide the role ID. All users who are assigned that custom role can build and run bots using the credentials in this locker, as well as enter values into credentials that accept user-provided attribute values.

```
{
  "id": "516"
}
```

**11. Send the request.**

**Response body:** This endpoint does not return data.

If you are following the steps to configure your Credential Vault, do this next: [Assign credential to locker API](#).

## Configure a credential with attribute values using API

Create a credential with a standard attribute and add two additional attributes with user-input values.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the `Authentication API` to generate a JSON Web Token. See [Authentication API](#).
- All roles have the `Manage my credentials and lockers` permission that is necessary to configure credentials and attributes. No additional permissions are necessary to use this endpoint.

In this example, you configure a credential with three attributes to hold email hostname, username, and password.

**1. Add the authentication token to the request header.****2. Create a credential. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/credentialvault/credentials.**

**Request body:** This example request includes the following required parameters:

- `userProvided`: a boolean value that configures whether the attribute requires a user's input (**true**) or is standard for all users (**false**).
- `masked`: a boolean value that configures whether the attribute value is masked with asterisks (**true**) or is visible to users (**false**).

```
{
  "name": "Email",
  "attributes": [
    {
      "name": "hostname",
```

```

    "userProvided": false,
    "masked": false
  }
]
}

```

### 3. Send the request.

**Response body:** In a successful request, this endpoint returns the following data:

- `id`: a unique numeric identifier for the credential.
- `attributes:id`: a unique numeric identifier for attribute.

```

{
  "id": "1630",
  "name": "Email",
  "description": "",
  "ownerId": "1508",
  "attributes": [
    {
      "id": "3335",
      "name": "hostname",
      "description": "",
      "userProvided": false,
      "masked": false,
      "createdBy": "1508",
      "createdOn": "2020-12-28T22:04:41.366448Z",
      "updatedBy": "1508",
      "updatedOn": "2020-12-28T22:04:41.366450Z",
      "version": "0",
      "passwordFlag": false
    }
  ],
  "createdBy": "1508",
  "createdOn": "2020-12-28T22:04:41.366460Z",
  "updatedBy": "1508",
  "updatedOn": "2020-12-28T22:04:41.366464Z",
  "version": "0"
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

### 4. Assign a standard value to the hostname attribute to the credential. Use the POST method and endpoint URL:<your\_control\_room\_url>/v2/credentialvault/credentials/{credentialId}/attributevalues.

```

{
  "list": [
    {
      "credentialAttributeId": "3335",
      "value": "mail.example.com"
    }
  ]
}

```

### 5. Send the request.

**Response body:**

```

{
  "list": [
    {

```

```

    "id": "1630",
    "credentialAttributeId": "3335",
    "value": "mail.example.com",
    "userId": "1508",
    "createdBy": "1508",
    "createdOn": "2020-12-28T22:04:41.366460Z",
    "updatedBy": "1508",
    "updatedOn": "2020-12-28T22:04:41.366464Z",
    "version": "0"
  }
]
}

```

6. Add the `username` and `password` attributes to the Email credential. Use the PUT method and endpoint URL: `<your_control_room_url>/v2/credentialvault/credentials/{credentialId}`.

**Request body:** Since you have specified the credential ID in the request URL, it is not required to include the credential ID or name in the request body. In this example request body, the `username` and `password` attributes are configured with values that accept a different input from each user. Additionally, the password attribute is configured to mask the entered value with asterisks.

```

{
  "attributes": [
    {
      "name": "username",
      "userProvided": true,
      "masked": false
    },
    {
      "name": "password",
      "userProvided": true,
      "masked": true
    }
  ]
}

```

7. Send the request.

**Response body:** The response body returns the credential with details of the three attributes.

```

{
  "id": "1630",
  "name": "Email",
  "description": "",
  "ownerId": "1508",
  "attributes": [
    {
      "id": "3335",
      "name": "hostname",
      "description": "",
      "userProvided": false,
      "masked": false,
      "createdBy": "1508",
      "createdOn": "2020-12-28T22:04:41.366448Z",
      "updatedBy": "1508",
      "updatedOn": "2020-12-28T22:04:41.366450Z",
      "version": "0",
      "passwordFlag": false
    },
    {
      "id": "3336",
      "name": "username",
      "description": "",

```

```

        "userProvided": true,
        "masked": false,
        "createdBy": "1508",
        "createdOn": "2020-12-28T22:04:41.366450Z",
        "updatedBy": "1508",
        "updatedOn": "2020-12-28T22:04:41.366450Z",
        "version": "0",
        "passwordFlag": false
    },
    {
        "id": "3337",
        "name": "password",
        "description": "",
        "userProvided": true,
        "masked": true,
        "createdBy": "1508",
        "createdOn": "2020-12-28T22:04:41.366450Z",
        "updatedBy": "1508",
        "updatedOn": "2020-12-28T22:04:41.366450Z",
        "version": "0",
        "passwordFlag": false
    }
],
"createdBy": "1508",
"createdOn": "2020-12-28T22:04:41.366460Z",
"updatedBy": "1508",
"updatedOn": "2020-12-28T22:06:35.366464Z",
"version": "2"
}

```

If you are following the steps to configure your Credential Vault, do this next: [Assign credential to locker API](#).

## Assign credential to locker API

Add a credential to a locker to enable other users to access the credential to build and run bots.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must have **own**, **manage**, or **participate** access permissions to the locker.

To assign a credential to a locker, you provide the credential and locker IDs in the URL.

1. Add the authentication token to the request header.
2. Use the PUT method and endpoint URL:: <your\_control\_room\_url>/v2/credentialvault/lockers/{lockerId}/credentials/{credentialId}.

**Request body:** This endpoint does not have a request body.

3. Send the request.

**Response body:** This endpoint does not return data.

## List credentials using API

Return a list of the credentials for which you are the owner or have access through a locker. If you have the **AAE\_Locker Admin** role, this endpoint returns all the credentials in the Control Room.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Use the `Authentication API` to generate a JSON Web Token. See [Authentication API](#).
- You must have access to the credential, either as the credential owner or through a locker.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: `<your_control_room_url>/credentialvault/credentials`.

**Note:** Append the `?consumed=true` parameter to the URL to return a list of credentials that have user-input values and are being used in bots.

**Request body:** Send an empty request to return all the credentials, sorted in alphabetical order.

```
{
  sort: [
    {
      field: "name",
      direction: "asc"
    }
  ]
}
```

3. Send the request.

**Response body:** The response returns the ID of each attribute and the `userProvided` parameter, which informs whether the value is set by each user (`true`) or is standard for all users (`false`).

```
{
  "page": {
    "offset": 0,
    "total": 1,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "1630",
      "name": "Email",
      "description": "",
      "ownerId": "1508",
      "attributes": [
        {
          "id": "3335",
          "name": "hostname",
          "description": "",
          "userProvided": false,
          "masked": false,
          "createdBy": "1508",
          "createdOn": "2020-12-28T22:04:41.366448Z",
          "updatedBy": "1508",
          "updatedOn": "2020-12-28T22:04:41.366450Z",
          "version": "0",
          "passwordFlag": false
        }
      ]
    }
  ]
}
```

```

    },
    {
      "id": "3336",
      "name": "username",
      "description": "",
      "userProvided": true,
      "masked": false,
      "createdBy": "1508",
      "createdOn": "2020-12-28T22:04:41.366450Z",
      "updatedBy": "1508",
      "updatedOn": "2020-12-28T22:04:41.366450Z",
      "version": "0",
      "passwordFlag": false
    },
    {
      "id": "3337",
      "name": "password",
      "description": "",
      "userProvided": true,
      "masked": true,
      "createdBy": "1508",
      "createdOn": "2020-12-28T22:04:41.366450Z",
      "updatedBy": "1508",
      "updatedOn": "2020-12-28T22:04:41.366450Z",
      "version": "0",
      "passwordFlag": false
    }
  ],
  "createdBy": "1508",
  "createdOn": "2020-12-28T22:04:41.366460Z",
  "updatedBy": "1508",
  "updatedOn": "2020-12-28T22:06:35.366464Z",
  "version": "2",
  "completed": true
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

Now that you have the IDs of attributes that accept a user-input value, next [Assign value to attribute using API](#).

## Assign value to attribute using API

Assign either a standard or user-input value to an attribute, based on your access permissions to the credential. A standard value is accessible by all users of the credential; an attribute with a user-input value enables each user to provide their own value which the other users cannot access.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).
- To set the standard value, you must have access to the credential, either as the credential owner or as a locker Admin or Manager.
- To set the user-input value, you must have access to the credential, either as the credential owner or as a locker consumer.

- Verify whether the attribute accepts a standard or user-input value. This is indicated in the userProvided output parameter. [List credentials using API](#).

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: <your\_control\_room\_url>/credentialvault/credentials/{credentialId}/attributevalues.

**Request body:**

```
{
  "list": [
    {
      "credentialAttributeId": "3337",
      "value": "aVerySecurePassword"
    }
  ]
}
```

3. Send the request.

**Response body:** The response confirms that a value was stored to the attribute, but for security reasons, the response does not contain the stored value.

```
[
  {
    "id":1630,
    "credentialAttributeId":3337,
    "value":"Szyx93Saw9xnnqF024XHSw==",
    "userId":2273,
    "createdBy":1508,
    "createdOn":"2021-02-03T18:42:33.383970Z",
    "updatedBy":1508,
    "updatedOn":"2021-02-03T18:42:33.383975Z",
    "version":0
  }
]
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Deploy bots using API

Use a combination of endpoints to deploy bots from the public workspace to Bot Runner devices.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### Prerequisites to deploy a bot

Ensure that you are allocated the following resources:

- **View and Run my bots** feature permission
- **Run and schedule** permissions for the folders that contain the bots
- Access to Bot Runner licensed users

- Access to either a default device or a device pool

---

**Note:** If the user associated with the Bot Runner license has a default device assigned to their account, the bot deploys on that device. If no default device is assigned, or you want to select a different device, then you must specify a device pool.

---

## Deploy a bot

1. [Authenticate with username and password API](#)
2. [List files and folders by workspace API](#)
3. [List available unattended Bot Runners API](#)
4. **Optional:** [List device pools API](#)
5. [Deploy bots API](#)
6. [Request bot deployment status API](#)

### Related concepts

#### [User management APIs](#)

Use `User Management` APIs to create, search, update, or delete roles and users in your Control Room.

### Related tasks

#### [List available unattended Bot Runners API](#)

Return a list of available users with unattended Bot Runner licenses. This endpoint returns the user id, which is a numeric value that is used by APIs to identify users.

## Deploy bots API

As a user with a Bot Runner license, deploy bots on your assigned devices. You can also pass variables to bots when they are deployed.

---

**Note:** You can view the `in the` , but API functionality is limited. You need a licensed `Edition` to access the full functionality of the APIs.

---

Ensure that you are allocated the following resources:

- **View and Run my bots** feature permission
- **Run and schedule** permissions for the folders that contain the bots
- Access to Bot Runner licensed users
- Access to either a default device or a device pool

---

**Note:** If the user associated with the Bot Runner license has a default device assigned to their account, the bot deploys on that device. If no default device is assigned, or you want to select a different device, then you must specify a device pool.

---

**Output variables:** There are two ways to return the value of output values:

- **Callback response:** If you define the callback sever in the request, the Control Room will send the values of output variables to the callback server. See this [example request](#).

You must define an output variable in the bot to retrieve the output value in the API response. [Create a variable](#)

- Use the [Bot Scheduler APIs](#) to schedule the bot to run one time or on a recurring basis. The API response includes the output variable values.

To deploy a bot and pass a variable value to the bot, you provide the following information to the API:

Parameter	Required	Type	Description
fileId	Yes	Number	Identifier for the bot to be deployed. <a href="#">List files and folders by workspace API</a>
runAsUserIds	Yes	Number	Identifier for a user that is registered with your Control Room as an Unattended bot runner. <a href="#">List available unattended Bot Runners API</a>
poolIds	No	Number	Identifier of a device pool that has at least one active device. If you enter multiple pool IDs, enter the values in the order of which you want the bot to check for available devices. If none of the devices are available at the time of deployment, the automation is queued.  <b>Note:</b> If the user associated with the Bot Runner license has a default device assigned to their account, the bot deploys on that device. If no default device is assigned, or you want to select a different device, then you must specify a device pool.  <a href="#">List device pools API</a>
overrideDefaultDevice	No	Boolean	If the Bot Runner user is assigned to a default device and you want to deploy to a device pool, set this parameter to <code>true</code> . If deploying to the default device, set this parameter to <code>false</code> .
botInput	No	Varies	Specify the input variable name, value, and data type.
numOfRunAsUsersToUse	No	Number	Specifies how many Bot Runners to use from the list of runAsUserIds. The weighted system algorithm selects the Bot Runners with the least number of queued tasks.
callbackInfo	No	Object	Provides the URL and authentication token for the callback server. After the bot is deployed, the Control Room sends the deployment status and output variable values to this callback server.

- Add the authentication token to the request header.
- Use the POST method and endpoint URL: `<your_control_room_url>/v3/automations/deploy`.

#### Request body:

This example request body specifies the required parameters as well as a value for an input variable.

```
{
  "fileId": 14277,
  "runAsUserIds": [
    2538
  ],
  "botInput": {
    "sDocHello": {
      "type": "STRING",
      "string": "Hello world, go be great."
    }
  }
}
```

```
}
}
```

This example request body specifies four `runAsUserIds` and two `numOfRunAsUsersToUse`. The weighted algorithm selects the two Bot Runners with the least number of tasks queued at the time of the deploy request.

```
{
  "fileId": 14277,
  "runAsUserIds": [
    2538,
    4256,
    2213,
    789
  ],
  "poolIds": [
    27
  ],
  "numOfRunAsUsersToUse": 2
}
```

This example request body includes the `overrideDefaultDevice` set to `true`, so the bot will be deployed to the device pool instead of the Run-as user's default device. This example also contains the syntax to specify the callback server URL and provide authorization.

```
{
  "fileId": 14277,
  "runAsUserIds": [
    245
  ],
  "poolIds": [
    27
  ],
  "overrideDefaultDevice": true,
  "callbackInfo": {
    "url": "https://callbackserver.com/storeBotExecutionStatus",
    "headers": {
      "X-Authorization": "eyJhbGciOiJSUzUxMiJ9.eyJzdWIiOiI0Ii"
    }
  }
}
```

### 3. Send the request.

#### **Response body:**

When successful, the Bot Deploy API returns a response with the `deploymentId`.

```
{
  "deploymentId": "14c2b6f8-c2a0-4a57-959d-ef413df0d179"
}
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

Perform this task: [Request bot deployment status API](#).

#### **Related tasks**

[List available unattended Bot Runners API](#)

Return a list of available users with unattended Bot Runner licenses. This endpoint returns the user id, which is a numeric value that is used by APIs to identify users.

#### [Search for users API](#)

Use the `Search for users` API to search for all users in the Control Room.

#### [Create a new user API](#)

Use the `Create user` API to create a new user in the Control Room.

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

## Device API

Identify all available users with unattended Bot Runner licenses, or filter for users by name.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

#### *Return available Bot Runners*

Return a list of available users with unattended Bot Runner licenses. This endpoint returns the user id, which is a numeric value that is used by APIs to identify users.

```
POST <control_room_URL>/v1/devices/
runasusers/list
```

## List available unattended Bot Runners API

Return a list of available users with unattended Bot Runner licenses. This endpoint returns the user id, which is a numeric value that is used by APIs to identify users.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).
- You must be assigned a custom role that is associated with a Run As user device.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: `<your_control_room_url>/v1/devices/runasusers/list`.

#### **Request body:**

```
{
  "sort": [
    {
      "field": "username",
      "direction": "asc"
    }
  ],
  "filter": {},
  "fields": [],
  "page": {}
}
```

```
}

```

#### *Filters in an API request body*

### 3. Send the request.

**Response body:** In a successful request, this endpoint returns the following data:

- **id:** a unique numeric identifier for a user with the Bot Runner license.
- **device:** if the user is configured with a default device, the device name is returned. For example, DESKTOP-DBO6SIE. Otherwise, this parameter returns the message `Picked at run time`, indicating that a device must be selected from a device pool in order to run a bot.

```
{
  "page":{
    "offset":0,
    "total":6,
    "totalFilter":6
  },
  "list":[
    {
      "id":"9",
      "username":"ubr01_rt",
      "device":"DESKTOP-DBO6SIE",
      "deviceId":"3"
    },
    {
      "id":"10",
      "username":"ubr02_rt",
      "device":"DESKTOP-DBO6SIE",
      "deviceId":"3"
    },
    {
      "id":"11",
      "username":"ubr03_rt",
      "device":"DESKTOP-DBO6SIE",
      "deviceId":"3"
    },
    {
      "id":"12",
      "username":"ubr04_rt",
      "device":"Picked at run time",
      "deviceId":"-1"
    },
    {
      "id":"13",
      "username":"ubr05_rt",
      "device":"Picked at run time",
      "deviceId":"-1"
    },
    {
      "id":"14",
      "username":"ubr06_rt",
      "device":"Picked at run time",
      "deviceId":"-1"
    }
  ]
}
```

If you are performing the steps to deploy a bot or to create an automation schedule, and the user associated with the Bot Runner license does not have a default device assigned or if you want to select a different device, perform this task: [List device pools API](#).

To deploy a bot that runs on the default device assigned to the Bot Runner user, perform this task: [Deploy bots API](#).

To create an automation schedule with a bot that runs on the default device assigned to the Bot Runner user, perform this task: [Schedule bot to run API](#).

### Related tasks

[Deploy bots API](#)

As a user with a Bot Runner license, deploy bots on your assigned devices. You can also pass variables to bots when they are deployed.

## Device pool API

Identify all available device pools or filter device pools by name. Retrieve detailed device pool information for a device by searching for its unique numeric identifier (ID).

A device pool is a logical grouping of devices used by a Bot Runner to distribute and manage the running of unattended bots.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### List device pools API

List all available device pools in your Control Room, or filter the list by the name of the device pool.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- You must be assigned a role that includes the `View and manage all devices` permission.

This task searches for all device pools that contain the string **finance** in the name.

1. Add the authentication token to the request header.
2. Use the POST and endpoint URL: `<your_control_room_url>/v2/devices/pools/list`.

```
{
  "filter": {
    "operator": "substring",
    "field": "name",
    "value": "finance"
  }
}
```

*Filters in an API request body*

3. Send the request.

#### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 15,
    "totalFilter": 1
  },
  "list": [
```

```

    {
      "id": "27",
      "name": "finance-device-pool",
      "status": "CONNECTED",
      "detailedStatus": "ALL_DISCONNECTED",
      "automationCount": "0",
      "ownerIds": [
        "48"
      ],
      "deviceCount": "3"
    }
  ]
}

```

A successful response lists one or more device pools. Use the ID of a device pool to view the details.

*Retrieve details of device pool by ID*

If you are performing the steps to run a bot perform this task: [Deploy bots API](#)

If you are performing the steps to create an automation schedule perform this task: [Schedule bot to run API](#)

## Retrieve details of device pool by ID

Retrieve the details of a specific device pool by its numeric identifier (ID).

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

Ensure you have the following to use this API:

- View and manage ALL device(s): View and manage all the devices, including devices registered by other users.
- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- Device pool id: The unique numeric identifier of the device pool for which you want to retrieve details.

This task searches in the Control Room for a specific device pool. The API passes the device pool {id} as part of the URL string. No request body is required.

1. Add the authentication token to the request header.

[Authentication API](#)

2. Use the GET method and endpoint URL: <your\_control\_room\_url>/v2/devices/pools/{id}.

Enter the device pool ID in the URL.

In this example, the device pool ID is **27**.

```
https://<your_control_room_url>/v2/devices/pools/27
```

3. Send the request.

When the request is successful, all the details associated with the passed device pools ID are returned in response body.

In this example, the name, automation scheme, status, Bot Runners, owners, and consumers, associated with the device pool ID **27** are returned in the response body

**Response body:**

```

{
  "id": "27",
  "name": "finance-device-pool",

```

```

"description": "Finance department device pool",
"automationScheme": "ROUND_ROBIN",
"status": "CONNECTED",
"timeSlice": "5",
"timeSliceUnit": "MINUTES",
"deviceIds": [
  "10",
  "23",
  "41"
],
"ownerIds": [
  "48"
],
"consumerIds": [],
"detailedStatus": "ALL_DISCONNECTED",
"updatedBy": "48",
"updatedOn": "2020-04-27T14:29:05.655896Z",
"createdBy": "48",
"createdOn": "2020-04-25T10:46:44.642586Z",
"tenantUuid": "c0a8f10a-717f-130b-8171-7f4762280000",
"tenantId": "4"
}

```

Review the details of the listed device pool to determine if it meets your bot deployment requirements. Some of the fields in the response are used as input to other APIs.

#### Evaluate these details:

<b>id</b>	The id uniquely identifies this device pool in the Control Room. Use this id as input for the poolIds for bot deployment.  <a href="#">Deploy bots API</a>
<b>name</b>	This is the user-defined name for the device pool. Filter the device pool name using filters in the list device pools task.  <a href="#">List device pools API</a>
<b>deviceIds</b>	List of the unique numeric IDs for Bot Runner devices that are part of this device pool.
<b>ownerIds</b>	The IDs of the owners of this device pool. Device pool owners can view, edit, or delete the device pool.
<b>consumerIds</b>	The IDs for users who can view this device while running automations.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Create device pool API

Device pools are a logical grouping of devices or similar Bot Runner machines on which you can run your workload management automations or scheduled automations. Create a device pool using an API with a unique name and add unattended Bot Runners to the device pool.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

Ensure you have the following:

- AAE\_Pool\_Admin role and View and manage ALL device(s) permission
- Use the Authentication API to generate a JSON Web Token. See [Authentication API](#).
- Endpoint URLs:
  - <your\_control\_room\_url>/v2/devices/pools
  - <your\_control\_room\_url>/v2/devices/list

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/devices/pools.  
If you want to search or get a list of all the available **deviceIds**, use the following endpoint URL:  
`https://<your_control_room_url>/v2/devices/list`

#### *Request device details*

For example:

```
POST https://192.0.2.0/v2/devices/pools
```

The this example request body enables you to add automation scheme, unattended Bot Runners, owners, and consumers in the device pool.

#### **Request body:**

```
{
  "name": "Finance-device-pool",
  "description": "Pool for Finance RPA",
  "deviceIds": [
    "1",
    "10"
  ],
  "automationScheme": "ROUND_ROBIN",
  "ownerIds": [
    "1",
    "24",
    "26"
  ],
  "consumerIds": [
    "21",
    "22"
  ]
}
```

3. Send the request.

When the request is successful, a unique device pool **id** is returned in the response body. The details of the devices, owners, and consumers associated with the device pool are also provided.

In this example, the response body returns the unique device pool **id** as 4.

#### **Response body:**

```
{
  "id": "4",
  "name": "Finance-device-pool",
  "description": "Pool for Finance RPA",
  "automationScheme": "ROUND_ROBIN",
  "status": "CONNECTED",
  "timeSlice": "5",
  "timeSliceUnit": "MINUTES",
  "deviceIds": [
    "1",
```

```

    "10"
  ],
  "ownerIds": [
    "1",
    "24",
    "26"
  ],
  "consumerIds": [
  ],
  "detailedStatus": "SOME_CONNECTED",
  "updatedBy": "24",
  "updatedOn": "2020-05-26T09:26:54.556280800Z",
  "createdBy": "24",
  "createdOn": "2020-05-26T09:26:54.556280800Z",
  "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c",
  "tenantId": "4"
}

```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

If you are performing the steps to [Create workload automation](#), next [Run bot with queue API](#).

If you are performing the steps to [Deploy a bot](#), next [Deploy bots API](#).

## License API

The License API contains endpoints to retrieve Control Room license details (such as expiration date and license mode) and manually sync the Control Room with the license server after license reallocation or renewal.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### Manage licenses

1. [Authenticate the user](#).

Use the POST method to generate an authentication JSON Web Token.

2. [Retrieve Control Room license details API](#).

Retrieve details of the Control Room license, including license type, expiration date, Fail-Safe status, and license server sync status.

3. If the `controlRoomLicenseServerSyncStatus` parameter returns `False`, use the Sync endpoint to update the license allocations and expiration date from the license server.

### List the license allocations

1. [Authenticate the user](#).

Use the POST method to generate an authentication JSON Web Token.

2. **If the license is cloud-based:** If new licenses were purchased, or if licenses were reallocated between Control Room instances, use the Sync endpoint to update the license allocations and expiration date from the license server.
3. *List details of the Control Room licenses*  
Retrieve Control Room metadata including the license type, number of available licenses, number of licenses used in a specific Control Room instance, and number of licenses used in all Control Room instances.

### Related reference

#### [Automation 360 licenses](#)

The All Licenses page displays detailed information about current product and device licenses.

## Retrieve Control Room license details API

Retrieve details of the Control Room license, including license type, expiration date, Fail-Safe status, and license server sync status.

1. Use the GET method and endpoint URL: `<your_control_room_url>/v2/license/details`.
2. Send the request.

**Response body:** In a successful request, this endpoint returns the following data:

- `failSafeStatus`: A numerical value that represents the Fail-Safe status of the Cloud Control Room. Values: 0 means the Control Room is connected, 1 means the Control Room is in Fail-Safe mode, and 2 means the Fail-Safe status has expired.

If the Control Room was configured with a file license, the returned value is always 0.

#### *Control Room Fail-Safe status*

- `controlRoomLicenseServerSyncStatus`: A Boolean value that determines whether the license allocations in this Control Room are in sync with the license server.
- `licenseMode`: Whether the Control Room license was configured from a file or through a connection with the license server.

#### *Entitlement models*

In this first example response, the `licenseMode` confirms that the Control Room is on a file-based license, thus the `failSafeStatus` is 0 and no value is returned for the `installedCrId`.

```
{
  "type": "PURCHASED",
  "installationDate": "2020-09-09T15:06:05.211Z",
  "expirationDate": "2021-06-30T18:29:59.999Z",
  "failSafeStatus": 0,
  "controlRoomLicenseServerSyncStatus": true,
  "installedCrId": "",
  "licenseMode": "FileLicense"
}
```

In the second example response, the `licenseMode` confirms that the Control Room is on a cloud-based license, the `failSafeStatus` has returned 1, which means that requests to other Control Room APIs will fail until the connection with the license server is reestablished, and the `controlRoomLicenseServerSyncStatus` has returned false.

```
{
  "type": "PURCHASED",
  "installationDate": "2020-09-14T18:30:00Z",
  "expirationDate": "2021-04-27T18:30:00Z",
  "failSafeStatus": 1,
  "controlRoomLicenseServerSyncStatus": false,
  "installedCrId": ""
}
```

```

    "failSafeStatus": 1,
    "controlRoomLicenseServerSyncStatus": false,
    "installedCrId": "b96edac7-b7e3-57bf-b857-ad14ac754674",
    "licenseMode": "CloudLicense"
  }

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

If the `controlRoomLicenseServerSyncStatus` parameter returns `False`, use the Sync endpoint to update the license allocations and expiration date from the license server.

## List details of the Control Room licenses

Retrieve Control Room metadata including the license type, number of available licenses, number of licenses used in a specific Control Room instance, and number of licenses used in all Control Room instances.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: `<your_control_room_url>/v2/license/product/list`.

**Request body:** Leave the body empty to retrieve a list of all the licenses.

```
{ }
```

3. Send the request.

**Response body:** In a successful request, this endpoint returns the following data:

- `name`: Returns the product license name, such as `ControlRoom`, `Analytics`, `BotFarm`, `Cognitive`, `DiscoveryBot`, and `AutomationAnywhereRoboticInterface`.
- `feature name`: Returns the device license, such as `Development for Bot Creator`, `Runtime for unattended Bot Runner`, and `AttendedRuntime for attended Bot Runner` licenses.
- `Enable`: Whether the license is enabled. If the returned value is `False`, that license cannot be assigned to a user.
- `PurchasedCount`: The total number of licenses the customer purchased.
- `usedCountByThisCr`: The number of licenses used in this Control Room instance.
- `usedCountByAllCr`: The total number of licenses that are used. If the license is file-based, this number matches the number in the `usedCountByThisCr` parameter. If the license is cloud-based, this parameter returns the total number of licenses used in all of the customer's Control Room instances.
- `availableCount`: The number of licenses that are available for allocation.
- `licenseType`: Whether the license was purchased or is a trial license.

### [Automation 360 licenses](#)

In this code example (truncated), the product name is `ControlRoom`, which means the license is for the Automation 360 product. The feature name is `Development`, indicating that the data is for the Bot Creator device license.

```

{
  "page": {

```

```

    "offset": 0,
    "total": 10,
    "totalFilter": 10
  },
  "list": [
    {
      "id": 1,
      "name": "ControlRoom",
      "feature": {
        "id": 1,
        "name": "Development",
        "enable": true,
        "purchasedCount": 5000,
        "usedCountByThisCr": 133,
        "usedCountByAllCr": 133,
        "availableCount": 4867,
        "licenseCountUnit": "NUMBER"
      },
      "licenseType": "PURCHASED"
    }
  ]
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Migration APIs

Use migration APIs to migrate MetaBots and TaskBots that were created in Enterprise client versions 11.x and 10.x to Automation 360. Use this page to review the migration prerequisites and access 11.x and 10.x Migration APIs.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

### Prerequisites

Complete the prerequisites before migrating 11.x bots to Automation 360. [Prerequisite tasks for migrating bots](#)

### 11.x Migration APIs

1. [Start migration API](#)
2. [Migrate all bots in a sub-folder API](#)
3. [List migration results API](#)
4. [Bot migration results by id API](#)
5. [Migration action mapping results API](#)

### 10.x Migration APIs

1. [Connect to 10.x database](#)

2. [Validate master key and repository path](#)
3. [Initiate 10.x data migration process](#)

(Optional) Use any the following APIs to retrieve the migration results.

- [Retrieve migrated roles](#)
- [Retrieve migrated users](#)
- [Retrieve migrated credentials](#)
- [Retrieve migrated bots](#)
- [Retrieve migrated schedules](#)

## Start migration API

Use this API to migrate bots (TaskBots and MetaBots) created using the Enterprise client version 11.x to Automation 360.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

Complete the prerequisites before migrating 11.x bots to Automation 360. [Prerequisite tasks for migrating bots](#)

### Request parameters:

Parameter	Required	Type	Description
name	Yes	String	The name for the migration entity.
description	No	String	A short description for the migration.
botIds	Yes	integer	Bot IDs to run the migration.
userIds	Yes	Integer	Bot Runner users IDs where this migration would be run on.
overwriteBots	No	Integer	Set this parameter to true if you want to migrate the already migrated again. The default value is false.

1. Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/migration/start.

This request migrates a single bot with the botIds of **74**, and the **userIds** of **18**.

### Request body:

```
{
  "name": "Docs Test Migration",
  "description": "docs test",
  "overwriteBots": true,
  "botIds": [
    74
  ],
  "userIds": [
    18
  ]
}
```

**3. Send the request.****Response body:**

```
{ }
```

The successful response includes a 200 success response and an empty body.

You can also migrate all the bots from a sub-folder.

*Migrate all bots in a sub-folder API*

Migrate all the bots separately as well as from a given folder and all if its sub-folders in your Control Room repository.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

View the migration status using the [List migration results API](#).

## Migrate all bots in a sub-folder API

Migrate all the bots separately as well as from a given folder and all if its sub-folders in your Control Room repository.

- Find the folder ID you want to migrate. The [List files and folders by workspace API](#) searches for files and folders in the private or public Control Room repositories. Filter the results to identify the folder ids to be used in the request body.
- For one or more users with a RUNTIME device license. Use `userIds` for registered users in the Control Room as unattended bot runners with a RUNTIME device license and registered device. [Search for users API](#)
- You must have an admin role to migrate bots and folders.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: `<your_control_room_url>/v3/migration/start`

**Request parameters:**

Parameter	Required	Type	Description
folderIds	Yes	Integer	Folder IDs for all the bots contained in the sub-folder with the
userIds	Yes	Integer	User IDs for an unattended Bot Runner user.
includeChildFolders	No	Boolean	Set this parameter to true if you want to include child folders migration. The default value is false.

This following request starts a migration for all the bots contained in the sub-folder with the folderIds: 7 and userIds: 18.

**Request body:**

```
{
  "name": "Follow a convention that is meaningful and easy to search.",
  "description": "Add a meaningful description.",
  "overwriteBots": true,
  "userIds": [
    18
  ],
}
```

```

    "folderIds": [
      7
    ],
    "includeChildFolders": true
  }

```

### 3. Send the request.

The successful response includes a 200 success code and an empty body.

```
{ }
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

You can view the status of the migration using the [List migration results API](#).

## List migration results API

List the overall migration results for each migration you run. Filter by selected fields to get the specific results.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

You must have an admin role or a custom role with **View Migration** permission.

**Supported filterable fields:** Use the following filters in the request body to narrow the results.

- name: The migration name.
- status: The migration status.
  - Success
  - Skipped
  - Failed
- migrationType: The migration type: BOT, ROLE, or AUDIT\_DATA.

1. Add the authentication token to the request header.

2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/migration/list.

### Request body:

This request searches for migrations that contain the word **HRBotMigration** in the name field that was started between the specified dates.

```

{
  "sort": [
    {
      "field": "startTime",
      "direction": "desc"
    }
  ],
  "filter": {
    "operator": "substring",
    "value": "HRBotMigration",
    "field": "name"
  },
  "fields": [],
  "page": {

```

```

    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}

```

### 3. Send the request.

#### Response body:

The example response returned the migration name, startTime and endTime, migration status, migrationType and other details.

```

{
  "page": {
    "offset": 0,
    "total": 17,
    "totalFilter": 1
  },
  "list": [
    {
      "id": 3,
      "name": " HRBotMigration ",
      "startTime": "2021-01-20T14:26:27.347Z",
      "endTime": "2021-01-20T14:27:36.617Z",
      "createdBy": 1,
      "duration": "69s",
      "numSuccess": 1,
      "numFailed": 0,
      "numSkipped": 0,
      "numTotal": 1,
      "status": "SUCCESSFUL",
      "updatedOn": "2021-01-20T14:26:47.850Z",
      "updatedBy": 1,
      "durationMillis": 69270,
      "migrationType": "BOT"
    }
  ]
}

```

**Note:** There are some response fields that are not used for 11.x migration:

- duration: A legacy field that is no longer used for migration.
- migrationType: It is used for 10.x migrations only. It is not used for 11.x migration.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

To view details about a specific migration, enter a specific migration id in the [Bot migration results by id API](#).

## Bot migration results by id API

List bot migration results by a unique numeric identifier, migrationId and filter the results by selected fields.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- You must have an admin role or a custom role with **View Migration** permission.
- Use the numeric identifier, migrationId for the migration you want to view.

### Supported filterable fields:

Use the following filters in the request body to narrow the search results:

- sourceName: Source bot name.
- sourceType: Source bot type.
- status: Migration status.
  - Success
  - Skipped
  - Failed
- reason: A reason why this bot migration is failed.
- targetName: Migrated bot target name.
- targetType: Migrated bot target type.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/migration/<migrationId>/results/list  
Enter the migration ID you want to view.
3. Create a request to find the search results. This filter searches for a string in the sourceName of the migrated bot.

#### Request body:

```
{
  "sort": [
    {
      "field": "sourceName",
      "direction": "asc"
    }
  ],
  "filter": {
    "operator": "substring",
    "value": "mbot-dep",
    "field": "sourceName"
  },
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}
```

4. Send the request.

#### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 3,
    "totalFilter": 1
  },
  "list": [
    {
```

```

        "sourceId": 24,
        "sourceName": "mbot-dep01.mbot",
        "sourcePath": "Automation Anywhere\\Bots\\My MetaBots\\mbot-
dep01.mbot",
        "sourceType": "application/vnd.aa.mbot",
        "targetId": 941,
        "status": "SUCCESS",
        "reason": "",
        "selectedByUser": true,
        "userId": 9,
        "id": 469,
        "targetName": "logic-launchweb01",
        "targetPath": "Automation Anywhere\\Bots\\My MetaBots\\mbot-
dep01\\logic-launchweb01",
        "targetType": "application/vnd.aa.taskbot"
    }
  ]
}

```

The response returned 1 out of 3 responses for bot migration results.

add link to the next API Migration Action mapping results.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

To view the list action mapping results, see [Migration action mapping results API](#).

## Migration action mapping results API

List action mapping results for bots by unique numeric identifiers for the migration {id} and the journal {journalid}, and then filter the results by selected fields.

- You must have an admin role or a custom role with **View migration** permission.
- The numeric identifier, {id}, for the migration you want to view.
- The numeric value for the {journalid} associated with the migration identifier. See [How to find a migration journalid](#)

### Supported filterable fields:

Use the following filters in the request body to narrow the search results:

- targetAction: Target action of the migrated bot.
- reason: The reason why this action migration is failed.

1. Add the authentication token to the request header.
2. In the request URL, enter the migration and journal IDs.
3. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/migration/{id}/journal/{journalid}/actionmappings/list

This request searches for action mappings that contain the word **not yet supported** in the reason.

### Request body

```

{
  "sort": [
    {
      "field": "targetLineNumber",
      "direction": "asc"
    }
  ]
}

```

```

    }
  ],
  "filter": {
    "operator": "substring",
    "value": "not yet supported",
    "field": "reason"
  },
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}

```

#### 4. Send the request.

##### Response body:

```

{
  "page": {
    "offset": 0,
    "total": 10,
    "totalFilter": 1
  },
  "list": [
    {
      "targetLineNumber": 1,
      "targetAction": "runTask",
      "isReviewRequired": true,
      "reason": " 1. The \"Run Task\" bot path defined with
variables is not yet supported.",
      "remarks": "",
      "id": 6,
      "sourceLineNumber": 0,
      "sourceAction": ""
    }
  ]
}

```

The response for this request returned 1 of 10 migration action mappings results.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## How to find a migration journalid

Migrations can have more than one journalid. You can find the journalid in the response of a results list for a specific migration id.

In this request, we searched for results for the migration with the id **16**.

```
<your_control_room_url>/v3/migration/16/results/list
```

The request returned the id in each object list as the journalid. In this example, there are two journal identifiers, 30 and 31, for the migration id 16.

```

{
  "page": {
    "offset": 0,
    "total": 2,

```

```

    "totalFilter": 2
  },
  "list": [
    {
      "sourceId": 12,
      "sourceName": "Dependency of IGN-23437.mbot",
      "sourcePath": "Automation Anywhere\\Bots\\My MetaBots\\
Dependency of IGN-23437.mbot",
      "sourceType": "application/vnd.aa.mbot",
      "targetId": 0,
      "status": "FAILED",
      "reason": "The logic IGN-23437 has some commands or actions
which are not yet supported for migration.",
      "selectedByUser": true,
      "userId": 9,
      "id": 30,
      "targetName": "",
      "targetPath": "",
      "targetType": ""
    },
    {
      "sourceId": 12,
      "sourceName": "Dependency of IGN-23437.mbot",
      "sourcePath": "Automation Anywhere\\Bots\\My MetaBots\\
Dependency of IGN-23437.mbot",
      "sourceType": "application/vnd.aa.mbot",
      "targetId": 0,
      "status": "FAILED",
      "reason": "Migration of MetaBot failed.",
      "selectedByUser": false,
      "userId": 9,
      "id": 31,
      "targetName": "",
      "targetPath": "",
      "targetType": ""
    }
  ]
}

```

You can use the migration id and journal id in an action mapping request.

```
<your_control_room_url>/v3/migration/16/journal/31/actionmappings/list
```

## 10.x Migration APIs

Use migration APIs to migrate MetaBots and TaskBots that were created in Enterprise client version 10.x to Automation 360. With these APIs, you can connect to the 10.x Control Room database, validate the master key and the repository path, and then start copying the 10.x data to Automation 360.

- Complete the prerequisites before migrating 10.x bots to Automation 360. See [Prerequisite tasks for migrating bots](#).
- You must have an admin role or the Manage Migration permission to validate connection parameters, connect to the 10.x database, and start 10.x migration process. If you want to retrieve a list of roles, users, credentials, and schedules, you need an admin role or the View Migration permission.
- Execute the following three APIs in order they are listed below. You can retrieve roles, users, credentials, bots, or schedules after you executed the mandatory APIs.

## Connect to 10.x database

Use this API to connect to the 10.x Control Room database from which you can copy the data to Automation 360.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Review the prerequisites before migrating bots to Automation 360.

*Prerequisite tasks for migrating bots*

- You must have an admin role or a custom role with **Manage Migration** permission to validate connection parameters and connect to the 10.x database.

- Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).
- Use the POST method and endpoint URL: `<your_control_room_url>/v2/migration/connection`

### Request body:

```
{
  "host": "10.000.000.000",
  "port": 1433,
  "databaseName": "CRDB",
  "username": "Admin",
  "password": "<password>",
  "integratedSecurity": false,
  "encrypt": false
}
```

### Request parameters:

Parameter	Required	Type	Description
host	Yes	String	SQL server host name or IP address
port	Yes	Integer	SQL server port number
databaseName	Yes	String	Source Control Room database name
userName	Yes	String	A user name to connect to the database
password	Yes	String	Password to connect to the database
integratedSecurity	Yes	Boolean	Set this to <code>true</code> if you want use Windows authentication. value is <code>false</code> .
encrypt	Yes	Boolean	Set this to <code>true</code> if you want to use a secure connection to database. The default value is <code>false</code> .

- Send the request.

### Response body:

It returns a success response code and an empty string.

```
{ }
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

*Validate master key and repository path*

## Validate master key and repository path

Use this API to validate the Credential Vault master key and the repository path.

- You must have an admin role or a custom role with **Manage Migration** permission to validate the master key and the repository path.
- Complete this step [Connect to 10.x database](#) before executing this API.

- Add the authentication token to the request header.
- Use the POST method and endpoint URL:<your\_control\_room\_url>/v2/migration/masterkey

**Request body:**

```
{
  "privateKey": "<CV master key value>",
  "repoPath": "C:\\Migration\\10X\\A2019.14\\Automation Anywhere Server Files"
}
```

If you are not able to get a response, add an additional backslash in the repoPath or use a single forward slash.

**Request parameters:**

Parameter	Required	Type	Description
privateKey	Yes	String	The master key to connect to 10.x Credential Vault. This is available for configuration during the initial Control Room migration.
repoPath	Yes	String	The shared repository path where the Control Room 10.x files are located.

- Send the request.

**Response body:**

It returns a success response code and an empty string.

```
{ }
```

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

*Initiate the 10.x data migration process*

## Initiate 10.x data migration process

Use this API to start the 10.x data migration.

- You must have an admin role or a custom role with **Manage Migration** permission to start the 10.x data migration.
- Complete this step [Validate master key and repository path](#) before executing this API.

- Add the authentication token to the request header.
- Use the POST method and endpoint URL:<your\_control\_room\_url>/v2/migration/start

**Request body:**

```
{
  "name": "Migration-10x-001",
  "description": "10x bot migration to A2019 001"
}
```

**Request parameters:**

Parameter	Required	Type	Description
name	Yes	String	The name for the migration entity.
description	No	String	A short description for the migration.

**3. Send the request.****Response body:**

```
{
  "id": "1",
  "name": "Migration-10x-001",
  "createdBy": "10",
  "migrationType": "ROLE",
  "entities": []
}
```

**Response parameters:**

Parameter	Description
id	The migration ID This is used for internal purpose only.
name	The migration name.
createdBy	ID of the user who has initiated this migration.
migrationType	Indicates the data migration type: Role or Bot This is used for 10.x migration only.
entities	List of migration entities.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

*Retrieve a list of migration roles***Retrieve migrated roles**

Use this API to retrieve 10.x roles that are copied to the Automation 360 database.

You must have an admin role or a custom role with **View Migration** permission to retrieve migrated roles.

1. Add the authentication token to the request header.
2. Use the ID from the API response body as the migrationId.

See [Initiate 10.x data migration process](#).

3. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/migration/{migrationId}/roles/list

**Request body:**

```
{
  "sort": [],
  "filter": {},
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}
```

**Request parameters:**

Parameter	Required	Type	Description
sort	No	String	Sort directions
filter	No	String	Filter rules
fields	No	String	Filter fields
page	Yes	Integer	Pagination rules
offset	Yes	Integer	Page starting index
total	No	Integer	Total number of items
totalFilter	No	Integer	Total number of items matching the filter
length	Yes	Integer	Number of items to be returned

4. Send the request.

**Response body:**

```
{
  "page": {
    "offset": 0,
    "total": 9,
    "totalFilter": 9
  },
  "list": [
    {
      "id": 1,
      "type": "ROLE",
      "sourceId": "1",
      "targetId": 1,
      "name": "Admin",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": ""
    },
    {
      "id": 2,
      "type": "ROLE",
      "sourceId": "2",
      "targetId": 2,
      "name": "Basic",
      "status": "SUCCESS",

```

```

    "reason": "",
    "targetPath": ""
  },
  .....
  {
    "id": 9,
    "type": "ROLE",
    "sourceId": "9",
    "targetId": 24,
    "name": "Admin_Role01",
    "status": "SUCCESS",
    "reason": "",
    "targetPath": ""
  }
]
}

```

**Response parameters:**

Parameter	Description
list	List of roles.
id	The role ID. This ID is used for UI purposes only.
type	The migration type.
sourceId	The source (database) role ID.
targetId	The migrated role ID.
name	A role name.
status	The migration status Valid values: Success, Skipped, or Failed.
reason	The reason why the migration failed.
targetPath	The migrated bot file location. It is only applicable for the bot migration.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

*Retrieve a list of migrated users***Retrieve migrated users**

Use this API to retrieve 10.x database users that are copied to the Automation 360 database.

You must have an admin role or a custom role with **View Migration** permission to retrieve migrated users.

1. Add the authentication token to the request header.
2. Use the ID from the API response as the migrationId.  
See [Initiate 10.x data migration process](#).
3. Use the POST method and endpoint URL:<your\_control\_room\_url>/v2/migration/{migrationId}/users/list

**Request body:**

```
{
  "sort": [],
  "filter": {},
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}
```

**Request parameters:**

Parameter	Required	Type	Description
sort	No	String	Sort directions
filter	No	String	Filter rules
fields	No	String	Filter fields
page	Yes	Integer	Pagination rules
offset	Yes	Integer	Page starting index
total	No	Integer	Total number of items
totalFilter	No	Integer	Total number of items matching filter
length	Yes	Integer	Number of items to be returned

**4. Send the request.****Response body:**

```
{
  "page": {
    "offset": 0,
    "total": 5,
    "totalFilter": 5
  },
  "list": [
    {
      "id": 10,
      "type": "USER",
      "sourceId": "1",
      "targetId": 11,
      "name": "admin_1",
      "status": "SUCCESS",
      "reason": "The user admin has been renamed to admin_1 as the user
with same name already exists",
      "targetPath": ""
    },
    .....
    {
      "id": 14,
      "type": "USER",
      "sourceId": "5",
      "targetId": 15,
      "name": "admin10503",
      "status": "SUCCESS",

```

```

    "reason": "",
    "targetPath": ""
  }
]
}

```

**Response parameters:**

Parameter	Description
list	List of users
id	The user ID It is used for UI purpose only.
type	The migration type
sourceId	The source (database) user ID
targetId	The migrated user ID
name	A user name
status	The migration status Valid values: Success, Skipped, or Failed.
reason	The reason why the migration failed.
targetPath	The migrated bot file location It is only applicable for bot migration.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

*Retrieve a list of migrated credentials***Retrieve migrated credentials**

Use this API to retrieve 10.x database credentials that are copied to the Automation 360 database.

You must have an admin role or a custom role with **View Migration** permission to retrieve migrated credentials.

1. Add the authentication token to the request header. Use the HTTP request syntax (URL):
2. Use the ID from the API response body as the migrationId.  
See [Initiate 10.x data migration process](#).
3. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/migration/{migrationId}/credentials/list

**Request body:**

```

{
  "sort": [],
  "filter": {},
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,

```

```

    "length": 200
  }
}

```

**Request parameters:**

Parameter	Required	Type	Description
sort	No	String	Sort directions
filter	No	String	Filter rules
fields	No	String	Filter fields
page	No	Integer	Pagination rules
offset	Yes	Integer	Page starting index
total	No	Integer	Total number of items
totalFilter	No	Integer	Total number of items matching the filter
length	Yes	Integer	Number of items to be returned

**4. Send the request.****Response body:**

```

{
  "page": {
    "offset": 0,
    "total": 2,
    "totalFilter": 2
  },
  "list": [
    {
      "id": 15,
      "type": "CREDENTIAL",
      "sourceId": "4",
      "targetId": 2,
      "name": "admin10501 - Email Settings",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": ""
    },
    {
      "id": 16,
      "type": "CREDENTIAL",
      "sourceId": "5",
      "targetId": 2,
      "name": "admin10502 - Email Settings",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": ""
    }
  ]
}

```

**Response parameters:**

Parameter	Description
list	List of credentials
id	The credential ID

Parameter	Description
type	The migration type
sourceId	The source (database) credential ID
targetId	The migrated credential ID
name	A credential name
status	The migration status Valid values: Success, Skipped, or Failed.
reason	The reason why the migration failed
targetPath	The migrated bot file location It is only applicable for the bot migration.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

#### *Retrieve a list of migrated bots*

### Retrieve migrated bots

Use this API to retrieve a list of 10.x migrated bots that are copied to the Automation 360 database.

You must have an admin role or a custom role with **View Migration** permission to retrieve migrated bots.

1. Add the authentication token to the request header. Use the HTTP request syntax (URL):
2. Use the ID from the API response body as the migrationId.  
See [Initiate 10.x data migration process](#).
3. Use the POST method and endpoint URL: <your\_control\_room\_url>/v2/migration/{migrationId}/bots/list

#### **Request body:**

```
{
  "sort": [],
  "filter": {},
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}
```

#### **Request parameters:**

Parameter	Required	Type	Description
sort	No	String	Sort directions
filter	No	String	Filter rules
fields	No	String	Filter fields
page	No	Integer	Pagination rules

Parameter	Required	Type	Description
offset	Yes	Integer	Page starting index
total	No	Integer	Total number of items
totalFilter	No	Integer	Total number of items matching the filter
length	Yes	Integer	Number of items to be returned

#### 4. Send the request. Send the request.

##### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 1004,
    "totalFilter": 1004
  },
  "list": [
    {
      "id": 17,
      "type": "BOT",
      "sourceId": "186",
      "targetId": 15,
      "name": "DelayLoop - Copy (129).atmx",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": "Automation Anywhere\\Bots\\My Tasks\\Migration
Extra"
    },
    {
      "id": 18,
      "type": "BOT",
      "sourceId": "438",
      "targetId": 17,
      "name": "DelayLoop - Copy (115).atmx",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": "Automation Anywhere\\Bots\\My Tasks\\Migration Extra
\\RM-APIAutomation"
    },
    .....
    {
      "id": 216,
      "type": "BOT",
      "sourceId": "703",
      "targetId": 221,
      "name": "DelayLoop - Copy (132).atmx",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": "Automation Anywhere\\Bots\\My Tasks"
    }
  ]
}
```

##### Response parameters:

Parameter	Description
list	List of bots
id	The bot ID

Parameter	Description
type	The migration type
sourceId	The source (database) bot ID
targetId	The migrated bot ID
name	The bot name
status	The migration status Valid values: Success, Skipped, or Failed.
reason	The reason why the migration failed
targetPath	The migrated bot file location

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

*Retrieve a list of migrated schedules*

## Retrieve migrated schedules

Use this API to retrieve a list of 10.x migrated schedules that are copied to the Automation 360 database.

You must have an admin role or a custom role with **View Migration** permission to retrieve migrated schedules.

1. Add the authentication token to the request header.
2. Use the ID from the API response body as the migrationId .  
See [Initiate 10.x data migration process](#).
3. Use the POST method and endpoint URL:<your\_control\_room\_url>/v2/migration/{migrationId}/schedules/list

### Request body:

```
{
  "sort": [],
  "filter": {},
  "fields": [],
  "page": {
    "offset": 0,
    "total": 100,
    "totalFilter": 100,
    "length": 200
  }
}
```

### Request parameters:

Parameter	Required	Type	Description
sort	No	String	Sort directions
filter	No	String	Filter rules
fields	No	String	Filter fields
page	No	Integer	Pagination rules

Parameter	Required	Type	Description
offset	Yes	Integer	Page starting index
total	No	Integer	Total number of items
totalFilter	No	Integer	Total number of items matching the filter
length	Yes	Integer	Number of items to be returned

#### 4. Send the request.

##### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 7,
    "totalFilter": 7
  },
  "list": [
    {
      "id": 1173,
      "type": "SCHEDULE",
      "sourceId": "3",
      "targetId": 2,
      "name": "Monthly",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": ""
    },
    {
      "id": 1174,
      "type": "SCHEDULE",
      "sourceId": "5",
      "targetId": 3,
      "name": "alternatemonths",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": ""
    },
    .....
    {
      "id": 1179,
      "type": "SCHEDULE",
      "sourceId": "15",
      "targetId": 8,
      "name": "none",
      "status": "SUCCESS",
      "reason": "",
      "targetPath": ""
    }
  ]
}
```

##### Response parameters:

Parameter	Description
list	List of schedules
id	The schedule ID
type	The migration type

Parameter	Description
sourceId	The source (database) schedule ID
targetId	The migrated schedule ID
name	The schedule name
status	The migration status Valid values: Success, Skipped, or Failed.
reason	The reason why the migration failed
targetPath	The migrated bot file location It is only applicable for the bot migration.

The REST API responds to each request with an HTTP response code. For response codes, see [API response codes](#).

## Repository Management APIs

Use the Repository Management APIs to return information on or to delete the objects (bots, folders, and files) that you have permissions to access in the Control Room.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

The Automation 360 repository is comprised of the private and public workspaces, which contain folders of bots (.atmx) and their dependency files. The private workspace holds objects that are only accessible to the logged-in user. Bots in the private workspace can only be run on that user's device. The public workspace holds objects that are accessible to all users who have the necessary permissions. When a bot is checked-in from a private workspace to the public workspace, it can be checked out by another user to their private workspace for editing or deployed to a Bot Runner.

---

**Note:**

- To view objects in your private workspace, you must have a Bot Creator license and a role that includes the `View my bots` feature permission.
  - To view objects in the public workspace, you must be assigned a role that includes the `View my bots` feature permission and the `View content` bot permission to folders in the public workspace.
- 

### Choosing a Repository Management list API

The following Repository Management APIs return information on objects (bots, files, and folders), based on the access granted by the user's role.

- `/file/list` returns details on all the objects for which you have access permissions.

*[List details about files, folders, and bots API](#)*

- `/folders/{folderid}/list` returns details on only the objects in a specific folder.

*[List files and folders in a specific folder API](#)*

- `/workspaces/{workspaceType}/files/list` returns details on only the objects in either the public or private workspace.

*List files and folders by workspace API*

## Supported filterable fields

Use the following filters in the request bodies of the list APIs to narrow down the response data.

### **createdBy**

The numeric identifier for the user who created a folder or bot.

```
{
  "operator": "eq",
  "field": "createdBy",
  "value": "2587"
}
```

### **folder**

This example searches for only folders. Set the value to `false` to search for only bots and files.

```
{
  "operator": "eq",
  "field": "folder",
  "value": "true"
}
```

### **name**

This example searches for objects that are named **Finance** or **finance**. This search is not case-sensitive.

- **Field:** name
- **Type:** string

```
{
  "filter": {
    "operator": "eq",
    "value": "finance",
    "field": "name"
  }
}
```

### **path**

This example searches for objects that contain the string **Finance** in the path parameter. This search is not case-sensitive.

- **Field:** path
- **Type:** string

```
{
  "filter": {
    "operator": "substring",
    "value": "Finance",
    "field": "path"
  }
}
```

## Related concepts

### [Bot permissions for a role](#)

Assign bot permissions when creating a role with the **View my bots** feature permission.

## List details about files, folders, and bots API

Return details about all the objects (bots, folders, and files) in the Control Room. This endpoint returns the object id, which is a numeric value that is used in other APIs to identify the file, folder or bot.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- To view objects in your private workspace, you must have a Bot Creator license and a role that includes the `View my bots` feature permission.
- To view objects in the public workspace, you must be assigned a role that includes the `View my bots` feature permission and the `View content` bot permission to folders in the public workspace.

Use filters such as bot names, folder paths, and IDs to narrow down the results. [Supported filterable fields](#)

1. Add the authentication token to the request header.

2. Use the POST method and endpoint URL: `<control_room_url>/v2/repository/file/list`

**Request body:** The following example request searches for objects that contain the string **finance** in the path.

```
{
  "filter": {
    "operator": "substring",
    "field": "path",
    "value": "finance"
  }
}
```

3. Send the request.

**Response body:** The **id** in the following response is the unique identifier for the bot.

In this example response, the endpoint returns a bot with an object **id** of 12.

```
{
  "page": {
    "offset": 0,
    "total": 4,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "12",
      "parentid": "11",
      "name": "FinanceHelloWorldGBG.atmx",
      "permission": {
        "delete": false,
        "download": true,
        "execute": false,
        "upload": true,
        "run": false
      },
      "lastModified": "2020-01-08T22:24:08.060Z",
      "lastModifiedBy": "10",
    }
  ]
}
```

```

    "path": "Automation Anywhere\\My Tasks\\Finance\\
    \FinanceHelloWorldGBG.atmx",
    "directory": false,
    "size": 4578,
    "locked": false,
    "fileLastModified": "2020-01-08T22:21:58Z",
    "isProtected": false
  }
]
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## List files and folders in a specific folder API

Return details about objects (bots, folders, and files) in a specific parent folder. This endpoint returns the object id, which is a numeric value that is used in other APIs to identify the file, folder or bot.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- To view objects in your private workspace, you must have a Bot Creator license and a role that includes the `View my bots` feature permission.
- To view objects in the public workspace, you must be assigned a role that includes the `View my bots` feature permission and the `View content bot` permission to folders in the public workspace.
- You require the folder ID for the folder you want to search in. Use one of the following Repository Management APIs to retrieve the object ID:
  - [List details about files, folders, and bots API](#)
  - [List files and folders by workspace API](#)

The example in this task searches for subfolders that contain the string **finance**.

1. Add the authentication token to the request header.
2. Use the POST method and endpoint URL: `<control_room_url>/v2/repository/folders/{folderId}/list`

**{folderId}** is the object ID of the folder that in which you want to search.

**Request body:** The following example request searches for folders that contain the word **finance** in the name.

```

{
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "substring",
        "field": "name",
        "value": "finance"
      },
      {
        "operator": "eq",
        "field": "folder",
        "value": "true"
      }
    ]
  }
}

```

```
}
}
```

### *Supported filterable fields*

### 3. Send the request.

**Response body:** In a successful request, this endpoint returns the following data:

- **id:** a unique numeric identifier for the object that matches the search parameters.
- **parentId:** a unique numeric identifier for the parent folder.
- **folder:** a boolean value that returns `true` if the object is a folder and `false` if it is a bot or other file.

In this example response, the endpoint returns a folder with the object `id` of 40378.

```
{
  "page": {
    "offset": 0,
    "total": 329,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "40378",
      "parentId": "2",
      "name": "EOD-finance-reports",
      "path": "Automation Anywhere\\Bots\\APAC\\EOD-finance-reports",
      "description": "",
      "type": "application/vnd.aa.directory",
      "size": "0",
      "folder": true,
      "folderCount": "0",
      "productionVersion": "",
      "latestVersion": "",
      "locked": false,
      "lockedBy": "0",
      "createdBy": "2587",
      "lastModifiedBy": "2587",
      "lastModified": "2020-09-02T05:26:51.162916Z",
      "permission": {
        "delete": true,
        "download": false,
        "upload": false,
        "run": true,
        "publishBotstore": false,
        "viewContent": true,
        "clone": false,
        "editContent": true,
        "createFolder": true,
        "move": true,
        "cancelCheckout": false,
        "revertCheckout": false
      },
      "workspaceId": "0",
      "botStatus": "DRAFT",
      "hasErrors": false,
      "workspaceType": "UNKNOWN",
      "metadata": false,
      "uri": "",
      "version": "0",
      "hasTriggers": false
    }
  ]
}
```

```
}
```

Use the numeric identifier, such as an id in subsequent APIs.

### Related tasks

#### Start migration API

Use this API to migrate bots (TaskBots and MetaBots) created using the Enterprise client version 11.x to Automation 360.

## List files and folders by workspace API

Return details on objects (files, folders, and bots) in either the public or private workspace. This endpoint returns the object id, which is a numeric value that is used in other APIs to identify the file, folder or bot.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the [Authentication API](#) to generate a JSON Web Token. See [Authentication API](#).
- To view objects in your private workspace, you must have a Bot Creator license and a role that includes the `View my bots` feature permission.
- To view objects in the public workspace, you must be assigned a role that includes the `View my bots` feature permission and the `View content` bot permission to folders in the public workspace.

1. Add the authentication token to the request header.

2. Use the POST method and endpoint URL: `<control_room_url>/v2/repository/workspaces/{workspaceType}/files/list`

**{workspaceType}** specifies whether to search in the public or private workspace.

The following example request searches for objects that contain the string **finance** in the name.

### Request body:

```
{
  "filter": {
    "operator": "substring",
    "field": "name",
    "value": "finance"
  }
}
```

#### Supported filterable fields

3. Send the request.

### Response body:

In this example response, this endpoint returns a bot with the object id of 14277.

```
{
  "page": {
    "offset": 0,
    "total": 1114,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "14277",
      "parentId": "9",
      "name": "financeWeeklyReport",
      "path": "Automation Anywhere\\Bots\\exampleBots",
      "description": "v1",
    }
  ]
}
```

```

    "type": "application/vnd.aa.taskbot",
    "size": "799",
    "folder": false,
    "folderCount": "0",
    "productionVersion": "",
    "latestVersion": "",
    "locked": false,
    "lockedBy": "0",
    "createdBy": "22",
    "lastModifiedBy": "22",
    "lastModified": "2020-10-21T17:42:10.140037Z",
    "permission": {
      "delete": false,
      "download": false,
      "upload": false,
      "run": true,
      "publishBotstore": false,
      "viewContent": false,
      "clone": false
    },
    "workspaceId": "0",
    "botStatus": "PUBLIC",
    "hasErrors": false,
    "workspaceType": "UNKNOWN",
    "metadata": false,
    "uri": "",
    "version": "3",
    "hasTriggers": false,
    "isModified": false
  }
}

```

### Response parameters:

- `id`: a unique numeric identifier for the object that matches the search parameters.
- `parentId`: a unique numeric identifier for the parent folder.
- `folder`: a boolean value that returns `true` if the object is a folder and `false` if it is a bot or other file.

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

If you are performing the steps to run a bot or to create an automation schedule, perform this task: [List available unattended Bot Runners API](#)

## Delete file/folder API

Use this API to delete objects (bots, files, or folders) from the public or your private workspace.

---

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

---

- Use the `Authentication API` to generate a JSON Web Token. See [Authentication API](#).
- You can delete bots, files, or folders from your private workspace. To delete objects from the public workspace, you must be assigned a role that contains the `Delete bot` permission on the folder that contains the objects that you want to delete.
- If you are deleting a folder, ensure that it is empty. Only empty folders can be deleted.

- To delete a file or folder, you must provide the object ID. Use one of the Repository Management list APIs to retrieve the object ID. [Choosing a Repository Management list API](#)
1. Add the authentication token to the request header.
  2. Use the DELETE method and endpoint URL: <control\_room\_URL>/v2/repository/files/{id}  
{id} is the object id of the file or folder that you want to delete.
  3. Send the request.

**Response body:** A successful request returns the following message

```
204 Successful delete
```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## User management APIs

Use User Management APIs to create, search, update, or delete roles and users in your Control Room.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

### User Management Roles

Users need the following permissions in order to create and manage users and roles.

- **View users**

You need an administrator permission to create and manage users and roles. It is recommended that non-administrator users be given limited permissions for creating and managing users. Learn how to [create a role with limited permissions](#) that can be assigned to users.

- **Create users**

Create new users in the Control Room.

- **Edit users**

Edit all users in the Control Room, including users created by other administrators.

- **Delete users**

Delete any user in the Control Room.

- **View roles**

Users with this permission can view roles to which they have access.

- **Manage roles**

Users can create, edit and delete roles to which they have access.

- **View licenses**

Users with these permissions are able to view and manage device licenses. Device licenses are required to enable users to perform specific tasks. For example, Bot Creators require a **DEVELOPMENT** device license in order to create bots.

- **Manage users device license**

Users with this permission can assign device licenses to other users.

## Role APIs

Use `Role` APIs to search for roles, create a role, retrieve a specific role using an object ID, update a role, or delete a role.

### *Search for roles API*

Retrieves current roles based on search criteria, such as filtering, sorting, and pagination.

```
POST http://<your_control_room_url>/v1/usermanagement/roles/list
```

### *Create a new role API*

Creates a new role with a new role name.

```
POST http://<your_control_room_url>/v1/usermanagement/roles
```

### *Retrieve a specific role API*

Retrieves a specific role based on a unique role ID.

```
GET http://<your_control_room_url>/v1/usermanagement/roles/{id}
```

### *Update a role API*

Modifies an existing role name based on a unique role ID.

```
PUT http://<your_control_room_url>/v1/usermanagement/roles/{id}
```

### *Delete an existing role API*

Deletes an existing role based on a unique role ID.

```
DELETE http://<your_control_room_url>/v1/usermanagement/roles/{id}
```

## User APIs

Use `User` APIs to create a user, search for users, retrieve a user details based on a user ID, update a specific user details, or delete a user.

### *Create a new user API*

Creates a user with a new user name.

```
POST http://<your_control_room_url>/v1/usermanagement/users
```

### *Search for users API*

Retrieves current users based on search criteria, such as filtering, sorting, and pagination.

```
POST http://<your_control_room_url>/v1/usermanagement/users/list
```

### *Retrieve a specific user details API*

Retrieves user details based on a unique user ID.

```
GET http://<your_control_room_url>/v1/usermanagement/users/{uid}
```

*Update an existing user details API*

Modifies an existing user name based on a unique user ID.

```
PUT http://<your_control_room_url>/v1/usermanagement/users/{uid}
```

*Delete an existing user API*

Deletes an existing user based on a unique user ID.

```
DELETE http://<your_control_room_url>/v1/usermanagement/users/{uid}
```

**Related concepts**[Authentication API](#)

Use the Authentication API to generate, refresh, and manage the JSON Web Tokens (JWTs) that are required for authentication and authorization in order to use the Control Room APIs.

**Related reference**[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Create a new role API

Use `Create role` API to create a new role with permissions in the Control Room.

Ensure you have an admin role or a custom role with **View and Manage Roles** permission to create a new role.

Each permission requires the following mandatory parameters:

- `id`: The numeric value that uniquely identifies the permission.
- `action`: The action the permission enables.
- `resourceType`: The resource group to which the action belongs.

Typically a user is given the role permission in conjunction with user management permission. [Roles and permissions](#)

1. Use the `Authentication` API to generate a JSON Web Token. See [Authentication API](#).
2. Use the POST method and endpoint URL: `<your_control_room_url>/v1/usermanagement/roles`

The following request creates a new role that allows a user to create and manage roles and users in the Control Room.

**Request body:**

```
{
  "name": "Role to manage users and roles",
  "description": "These are limited administrator permission.",
  "permissions": [
    {
      "id": 1,
      "action": "usermanagement",
      "resourceType": "usermanagement"
    },
    {
      "id": 3,
```

```

    "action": "createuser",
    "resourceType": "usermanagement"
  },
  {
    "id": 4,
    "action": "updateuser",
    "resourceType": "usermanagement"
  },
  {
    "id": 2,
    "action": "deleteuser",
    "resourceType": "usermanagement"
  },
  {
    "id": 62,
    "action": "rolesview",
    "resourceType": "rolesmanagement"
  },
  {
    "id": 12,
    "action": "rolesmanagement",
    "resourceType": "rolesmanagement"
  }
]
}

```

### 3. Send the request.

#### Response body:

```

{
  "id": 767,
  "createdBy": 3215,
  "createdOn": "2020-03-19T22:44:21Z",
  "updatedBy": 3215,
  "updatedOn": "2020-03-19T22:44:21Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "description": "These are limited administrator permission.",
  "name": "Role to manage users and roles",
  "accessRestriction": null,
  "permissions": [
    {
      "id": 1,
      "createdBy": 0,
      "createdOn": "2019-05-21T03:09:31Z",
      "updatedBy": 0,
      "updatedOn": "2019-05-21T03:09:31Z",
      "tenantId": 1,
      "version": 0,
      "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
      "action": "usermanagement",
      "resourceId": null,
      "resourceType": "usermanagement"
    },
    {
      "id": 2,
      "createdBy": 0,
      "createdOn": "2019-05-21T03:09:31Z",
      "updatedBy": 0,
      "updatedOn": "2019-05-21T03:09:31Z",
      "tenantId": 1,
      "version": 0,

```

```
"tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
"action": "deleteuser",
"resourceId": null,
"resourceType": "usermanagement"
},
{
  "id": 4,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "updateuser",
  "resourceId": null,
  "resourceType": "usermanagement"
},
{
  "id": 12,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "rolesmanagement",
  "resourceId": null,
  "resourceType": "rolesmanagement"
},
{
  "id": 62,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "rolesview",
  "resourceId": null,
  "resourceType": "rolesmanagement"
},
{
  "id": 3,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "createuser",
  "resourceId": null,
  "resourceType": "usermanagement"
}
],
"countPrincipals": 0,
"principals": []
```

```
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Search for roles API

Use the `Search for Roles` API to retrieve a list of all roles in the Control Room.

Ensure you have an admin role or a custom role with **View Roles** permission to search for roles.

1. Add the authentication token to the request header.
2. Apply filters to perform basic conditional queries and pagination control for processing web pages. There are three basic features related to filtering: filtering conditions, sorting columns, and pagination parameters. See [Filters in an API request body](#).
3. Use the POST method and endpoint URL: `<your control room>/v1/usermanagement/roles/list`

The following request finds roles with a `name` that contains `test` and were created between June 1 and October 6, 2020.

### Request body:

```
{
  "fields": [],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "substring",
        "field": "name",
        "value": "test"
      },
      {
        "operator": "gt",
        "field": "createdOn",
        "value": "2020-06-01T00:00:00.989Z"
      },
      {
        "operator": "lt",
        "field": "createdOn",
        "value": "2020-10-06T23:00:00.123Z"
      }
    ]
  }
}
```

4. Send the request.

In this example, the response body brings five roles with the name `test`, and when and who created a role, as well as, whether a role was a system created role or not.

### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 106,
    "totalFilter": 5
  },
  "list": [
```

```
{
  "id": 102,
  "name": "whatfixtest",
  "description": "",
  "countPrincipals": 0,
  "version": 3,
  "createdBy": 278,
  "createdOn": "2020-06-02T18:22:55.633Z",
  "updatedBy": 34,
  "updatedOn": "2020-09-02T23:26:11.930Z",
  "systemRole": false
},
{
  "id": 115,
  "name": "export-role-test",
  "description": "",
  "countPrincipals": 5,
  "version": 8,
  "createdBy": 261,
  "createdOn": "2020-06-04T10:59:45.343Z",
  "updatedBy": 96,
  "updatedOn": "2020-09-14T16:56:33.310Z",
  "systemRole": false
},
{
  "id": 391,
  "name": "testRole",
  "description": "",
  "countPrincipals": 0,
  "version": 0,
  "createdBy": 169,
  "createdOn": "2020-07-01T01:08:45.243Z",
  "updatedBy": 169,
  "updatedOn": "2020-07-01T01:08:45.243Z",
  "systemRole": false
},
{
  "id": 401,
  "name": "bi-test-role",
  "description": "",
  "countPrincipals": 1,
  "version": 5,
  "createdBy": 1,
  "createdOn": "2020-07-02T02:56:57.893Z",
  "updatedBy": 96,
  "updatedOn": "2020-09-14T16:56:33.280Z",
  "systemRole": false
},
{
  "id": 470,
  "name": "repo_test",
  "description": "",
  "countPrincipals": 1,
  "version": 1,
  "createdBy": 1,
  "createdOn": "2020-09-09T07:49:46.993Z",
  "updatedBy": 96,
  "updatedOn": "2020-09-14T16:56:32.913Z",
  "systemRole": false
}
]
```

```
}
```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Retrieve a specific role API

Use the `Get role by ID` API to retrieve a specific role in the Control Room.

Ensure you have an admin role or a custom role with **View Roles** permission.

- URL: `http://<your_control_room_url>/v1/usermanagement/roles/2 <role ID>`
- Method: **GET**
- Use the Swagger definition files installed with your Control Room to test the APIs. View the available Swagger APIs at: `http://<your_control_room_url>/swagger/`
- You can also use a REST client to complete this task.

1. Add the authentication token to the request header.
2. Add a role ID that you want to retrieve, for example, `customRole`.
3. Use the GET method and endpoint URL: `<your_control_room_url>/v1/usermanagement/roles/2 <role ID>`
4. Send the request.

### Response body:

```
{
  "id": 740,
  "createdBy": 2623,
  "createdOn": "2020-02-24T19:08:09Z",
  "updatedBy": 2623,
  "updatedOn": "2020-02-24T19:08:09Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "description": "",
  "name": "customRole",
  "accessRestriction": null,
  "permissions": [
    {
      "id": 59,
      "createdBy": 0,
      "createdOn": "2019-05-21T03:09:31Z",
      "updatedBy": 0,
      "updatedOn": "2019-05-21T03:09:31Z",
      "tenantId": 1,
      "version": 0,
      "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
      "action": "managecredentials",
      "resourceId": null,
      "resourceType": "credentials"
    },
    {
      "id": 12,
      "createdBy": 0,
      "createdOn": "2019-05-21T03:09:31Z",
      "updatedBy": 0,
      "updatedOn": "2019-05-21T03:09:31Z",
      "tenantId": 1,
      "version": 0,

```

```
"tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
"action": "rolesmanagement",
"resourceId": null,
"resourceType": "rolesmanagement"
},
{
  "id": 62,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "rolesview",
  "resourceId": null,
  "resourceType": "rolesmanagement"
},
{
  "id": 58,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "myschedule",
  "resourceId": null,
  "resourceType": "taskscheduling"
},
{
  "id": 97,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:39Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:39Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "view",
  "resourceId": null,
  "resourceType": "dashboard"
},
{
  "id": 30,
  "createdBy": 0,
  "createdOn": "2019-05-21T03:09:31Z",
  "updatedBy": 0,
  "updatedOn": "2019-05-21T03:09:31Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "action": "view",
  "resourceId": null,
  "resourceType": "devices"
}
],
"countPrincipals": 0,
"principals": []
```

```
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Update a role API

Use the `Update role` API to update an existing role in the Control Room.

Ensure you have an admin role or a custom role with **Edit Roles** permission.

1. Add the authentication token to the request header.
2. Use the PUT method and endpoint URL: `<your_control_room_url>/v1/usermanagement/roles/2 <role ID>`
3. In the request URL, add a role ID you want to update. This example shows how to add a single permission, **View users** to the custom role with the ID of 740.

### Request body:

```
{
  "id": null,
  "name": "Add_one_permission",
  "accessRestriction": null,
  "permissions": [
    {
      "id": 1,
      "action": "usermanagement",
      "resourceType": "usermanagement"
    }
  ]
}
```

4. Send the request.

### Response body:

```
{
  "id": 740,
  "createdBy": 2623,
  "createdOn": "2020-02-24T19:08:09Z",
  "updatedBy": 3215,
  "updatedOn": "2020-03-20T21:40:34Z",
  "tenantId": 1,
  "version": 4,
  "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
  "description": null,
  "name": "Add_one_permission",
  "accessRestriction": null,
  "permissions": [
    {
      "id": 1,
      "createdBy": 0,
      "createdOn": "2019-05-21T03:09:31Z",
      "updatedBy": 0,
      "updatedOn": "2019-05-21T03:09:31Z",
      "tenantId": 1,
      "version": 0,
      "tenantUuid": "e100fbce-008c-04ec-4063-7af0af91fb2f",
      "action": "usermanagement",
      "resourceId": null,
      "resourceType": "usermanagement"
    }
  ]
}
```

```

    }
  ],
  "countPrincipals": 0,
  "principals": []
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Delete an existing role API

Use the `Delete role` API to delete an existing role in the Control Room.

Ensure you have an admin role or a custom role with **Manage Roles** permission. You can only delete custom roles you cannot delete the system-created roles.

- URL: `http://<your_control_room_url>/v1/usermanagement/roles/2 <role ID>`  
Replace the content in the angle brackets with your Control Room URL.
- Method: **DELETE**
- Use the Swagger definition files installed with your Control Room to test the APIs. View the available Swagger APIs at: `http://<your_control_room_url>/swagger/`
- You can also use a REST client to complete this task.

1. Add the authentication token to the request header.
2. Use the **DELETE** as the endpoint URL: `<your_control_room_url>/v1/usermanagement/roles/2 <role ID>`
3. In the request header, add a role ID you want to delete.
4. Send the request.

### Response body:

```
"OK"
```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Create a new user API

Use the `Create user` API to create a new user in the Control Room.

### View and manage users and roles

Authenticate with a user that has the following **ADMINISTRATION** permissions:

- **View users**

You need an administrator permission to create and manage users and roles. It is recommended that non-administrator users be given limited permissions for creating and managing users. Learn how to [create a role with limited permissions](#) that can be assigned to users.

- **Create users**

Create new users in the Control Room.

- **Edit users**

Edit all users in the Control Room, including users created by other administrators.

- **Delete users**

Delete any user in the Control Room.

- **View roles**

Users with this permission can view roles to which they have access.

- **Manage roles**

Users can create, edit and delete roles to which they have access.

- **View licenses**

Users with these permissions are able to view and manage device licenses. Device licenses are required to enable users to perform specific tasks. For example, Bot Creators require a **DEVELOPMENT** device license in order to create bots.

- **Manage users device license**

Users with this permission can assign device licenses to other users.

### Minimum required parameters

- **Roles:** Each user must have at least one role.

*Role* based accessibility enables appropriate access to relevant data and actions.

In the request body, we assigned this permission **AAE\_Basic (ID: 2)**

*Roles and permissions*

- **username:** String (255 max)
- **email:** Must conform to standard email format (username@domain.com)
- **password:** String: 8-15 characters in length. Allowable characters: a-z, A-Z, 0-9, @, -, \_, !, #, \$, %, &, and . (period)

### Optional parameters

- "enableAutoLogin": true
- "username": "AnyUser"
- "firstName": "Tester"
- "lastName": "Writer"
- "email": "username@mydomain.com"
- "password": "anypassword"
- "description": "Testing User Management APIs"
- "licenseFeatures": [ DEVELOPMENT, RUNTIME, IQBOTRUNTIME, ANALYTICSCLIENT, ANALYTICSAPI ]

Users can be created without an assigned device license. There are *Roles and permissions* that enable privileges for specific users and roles.

- **URL:** `http://<your_control_room_url>/v1/usermanagement/users`

Replace the content in the angle brackets with your Control Room URL.

- **Method:** **POST**

- Use the Swagger installed with your Control Room to test the APIs. View the available APIs at: `http://<your_control_room_url>/swagger/`

- You can also use a REST client to complete this task.
- Add the authentication token to the request header.
  - Use the POST method and endpoint URL:<your\_control\_room\_url>/v1/usermanagement/users
  - In the request body, enter the mandatory and optional parameters.  
For SAML-based single sign-on (SSO) or Active Directory (AD) access, the password is not required. The password is mandatory for a database authentication.

**Request body :**

```
{
  {
    "roles": [
      {
        "id": 2
      }
    ],
    "domain": "string",
    "email": "ad@ma.com",
    "enableAutoLogin": true,
    "username": "mdadmin1",
    "firstName": "MDadmin2",
    "lastName": "ADadmin",
    "description": "string",
    "disabled": true,
    "password": "changeme",
    "licenseFeatures": [
      "DEVELOPMENT"
    ]
  }
}
```

- Send the request.

**Response body:**

```
{
  "id": 2075,
  "username": "mdadmin1",
  "domain": "string",
  "firstName": "MDadmin2",
  "lastName": "ADadmin",
  "version": 0,
  "principalId": 2075,
  "deleted": false,
  "roles": [
    {
      "name": "AAE_Basic",
      "id": 2,
      "version": 0
    }
  ],
  "sysAssignedRoles": [],
  "groupNames": [],
  "permissions": [
    {
      "id": 7526,
      "action": "viewuserrolebasicinfo",
      "resourceId": null,
      "resourceType": "usermanagement"
    }
  ],
}
```

```

        "id": 7,
        "action": "run",
        "resourceId": null,
        "resourceType": "repositorymanager"
    },
    {
        "id": 94,
        "action": "view",
        "resourceId": null,
        "resourceType": "botstore"
    },
    {
        "id": 61,
        "action": "createstandard",
        "resourceId": null,
        "resourceType": "credentialattribute"
    },
    {
        "id": 92,
        "action": "view",
        "resourceId": null,
        "resourceType": "packagemanager"
    },
    {
        "id": 97,
        "action": "register",
        "resourceId": null,
        "resourceType": "devices"
    },
    {
        "id": 29,
        "action": "view",
        "resourceId": null,
        "resourceType": "repositorymanager"
    },
    {
        "id": 120,
        "action": "view",
        "resourceId": null,
        "resourceType": "dashboard"
    }
],
"licenseFeatures": [
    "DEVELOPMENT"
],
"emailVerified": false,
"passwordSet": false,
"questionsSet": false,
"enableAutoLogin": true,
"disabled": true,
"clientRegistered": false,
"description": "string",
"createdBy": 1513,
"createdOn": "2020-11-20T20:17:26Z",
"updatedBy": 1513,
"updatedOn": "2020-11-20T20:17:26Z",
"publicKey": null,
"appType": null,
"routingName": null,
"appUrl": null,
"email": "ad@ma.com"

```

```
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Search for users API

Use the `Search for users` API to search for all users in the Control Room.

Ensure you have an admin role or a custom role with **View Users** permission.

1. Add the authentication token to the request header.
2. Apply filters to perform basic conditional queries and pagination control for processing web pages. There are three basic features related to filtering: filtering conditions, sorting columns, and pagination parameters. See [Filters in an API request body](#).
3. Use the POST method and endpoint URL: `<your_control_room_url>/v1/usermanagement/users/list`

### Request body:

```
{
  "fields": [],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "substring",
        "field": "username",
        "value": "mdadmin"
      },
      {
        "operator": "gt",
        "field": "createdOn",
        "value": "2020-09-01T00:00:00.989Z"
      },
      {
        "operator": "lt",
        "field": "createdOn",
        "value": "2020-09-06T23:00:00.123Z"
      }
    ]
  }
}
```

4. Send the request.

The following request finds all users with a `username` that contains `admin` and were created between September 1 and September 6, 2020.

### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 310,
    "totalFilter": 2
  },
  "list": [
    {
      "id": 1513,
      "username": "mdadmin",

```

```
"domain": "",
"firstName": "MD_tester",
"lastName": "MD_user",
"version": 17,
"principalId": 1513,
"email": "md@aa.com",
"emailVerified": true,
"passwordSet": true,
"questionsSet": true,
"enableAutoLogin": false,
"disabled": false,
"clientRegistered": false,
"description": "To be used for API testing",
"createdBy": 1,
"createdOn": "2020-09-01T11:01:17.760Z",
"updatedBy": 1,
"updatedOn": "2020-09-01T11:01:17.760Z",
"licenseFeatures": [],
"roles": [
  {
    "id": 1,
    "name": "AAE_Admin"
  },
  {
    "id": 2,
    "name": "AAE_Basic"
  }
],
"deleted": false
},
{
  "id": 1520,
  "username": "mt_admin",
  "domain": "",
  "firstName": "",
  "lastName": "",
  "version": 6,
  "principalId": 1520,
  "email": "a@a.com",
  "emailVerified": true,
  "passwordSet": true,
  "questionsSet": true,
  "enableAutoLogin": false,
  "disabled": false,
  "clientRegistered": false,
  "description": "",
  "createdBy": 1,
  "createdOn": "2020-09-02T08:47:19.723Z",
  "updatedBy": 1,
  "updatedOn": "2020-09-02T08:47:19.723Z",
  "licenseFeatures": [],
  "roles": [
    {
      "id": 1,
      "name": "AAE_Admin"
    }
  ],
  "deleted": false
}
]
```

```
}

```

The response returned data for two user names containing the word `admin`, `mdadmin` and `mt_admin`.

#### Response parameters:

Parameter Name	Description
id	System-generated ID number who created a user.
username	User name for a new user.
domain	Active directory domain name.
version	System-generated version number for a new user.
email	New user email address.
passwordSet	String: 8-15 characters; a-z, A-Z, 0-9, @, -, _, !, #, \$, %, &, and . (period). Set a password for a new user only.
PrincipalId	System-generated ID number of an active directory principal user who created a new user.
Permission	A specific permission ID.
licenseFeature	Automation Anywhere license associated with this role.
Roles: id	System-generated role ID number associated with this user. Not every user has an associated role.
createdBy	System-generated ID number of an admin user who created a new user.
updatedBy	System-generated ID number of an admin user who updated the user.

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Retrieve a specific user details API

Use the `Get user details` API to retrieve a specific user details in the Control Room.

Ensure you have an admin role or a custom role with **View Users** permission.

1. Add the authentication token to the request header.
2. In the request header, add a specific user ID you want to retrieve.
3. Use the GET method and endpoint URL: `<your_control_room_url>/v1/usermanagement/users/2 <user ID>`

#### 4. Send the request.

We are sending request to retrieve details for the specific user ID: 2075

#### Response body:

```
{
  "id": 2075,
  "username": "mdadmin1",
  "domain": "string",
  "firstName": "MDadmin2",
  "lastName": "ADadmin",
  "version": 0,
  "principalId": 2075,
  "deleted": false,
  "roles": [
    {
      "name": "AAE_Basic",
      "id": 2,
      "version": 0
    }
  ],
  "sysAssignedRoles": [],
  "groupNames": [],
  "permissions": [
    {
      "id": 7526,
      "action": "viewuserrolebasicinfo",
      "resourceId": null,
      "resourceType": "usermanagement"
    },
    {
      "id": 7,
      "action": "run",
      "resourceId": null,
      "resourceType": "repositorymanager"
    },
    {
      "id": 94,
      "action": "view",
      "resourceId": null,
      "resourceType": "botstore"
    },
    {
      "id": 61,
      "action": "createstandard",
      "resourceId": null,
      "resourceType": "credentialattribute"
    },
    {
      "id": 92,
      "action": "view",
      "resourceId": null,
      "resourceType": "packagemanager"
    },
    {
      "id": 97,
      "action": "register",
      "resourceId": null,
      "resourceType": "devices"
    },
    {
      "id": 29,
      "action": "view",

```

```

        "resourceId": null,
        "resourceType": "repositorymanager"
      },
      {
        "id": 120,
        "action": "view",
        "resourceId": null,
        "resourceType": "dashboard"
      }
    ],
    "licenseFeatures": [
      "DEVELOPMENT"
    ],
    "emailVerified": false,
    "passwordSet": false,
    "questionsSet": false,
    "enableAutoLogin": true,
    "disabled": true,
    "clientRegistered": false,
    "description": "string",
    "createdBy": 1513,
    "createdOn": "2020-11-20T20:17:26Z",
    "updatedBy": 1513,
    "updatedOn": "2020-11-20T20:17:26Z",
    "publicKey": null,
    "appType": null,
    "routingName": null,
    "appUrl": null,
    "email": "ad@ma.com"
  }
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Update an existing user details API

Use the `Update user details` API to update an existing user information in the Control Room.

Ensure you have an admin role or a custom role with **Edit Users** permission.

1. Add the authentication token to the request header.
2. Use the PUT method and endpoint URL: `<your_control_room_url>/v1/usermanagement/users/744`
3. In the request header, add an existing user ID you want to update. To find a user ID you want to update, execute the `Search for users` API.

If you want to add a new role ID to your request, perform the following steps:

- a) Execute the `Search for users` API. Use the POST method and endpoint URL: `<your_control_room_url>/v1/usermanagement/users/list`
- b) When you get all role IDs, add a new role to the existing role IDs. You will not be able to add one role by itself, you must add it to the collection of role IDs.

The following request body is for an existing user ID: 744 and the existing role IDs: 169, 2, and 26. Modify other parameters as needed.

### Request body

```

{
  "roles": [

```

```

    {
      "id": 169
    },
    {
      "id": 2
    },
    {
      "id": 26
    }
  ],
  "email": "Joe.Smith@automationanywhere.com",
  "enableAutoLogin": false,
  "firstName": "FN",
  "lastName": "LN",
  "description": "test",
  "disabled": false,
  "licenseFeatures": [
    "RUNTIME"
  ]
}

```

#### 4. Send the request.

The response body returns the updated details for the user ID: 744.

#### Response body:

```

{
  "id": 744,
  "username": "cs_runner",
  "domain": null,
  "firstName": "FN",
  "lastName": "LN",
  "version": 60,
  "principalId": 744,
  "deleted": false,
  "roles": [
    {
      "name": "AAE_Basic",
      "id": 2,
      "version": 0
    },
    {
      "name": "cs_role2",
      "id": 169,
      "version": 3
    },
    {
      "name": "all",
      "id": 26,
      "version": 54
    }
  ],
  "sysAssignedRoles": [],
  "groupNames": [],
  "permissions": [
    {
      "id": 2912,
      "action": "upload",
      "resourceId": "34241",
      "resourceType": "repositorymanager"
    },
    .....
  ]
}

```

```

        "id": 4101,
        "action": "download",
        "resourceId": "34439",
        "resourceType": "repositorymanager"
    }
  ],
  "licenseFeatures": [
    "RUNTIME"
  ],
  "emailVerified": true,
  "passwordSet": true,
  "questionsSet": true,
  "enableAutoLogin": false,
  "disabled": false,
  "clientRegistered": false,
  "description": "test",
  "createdBy": 451,
  "createdOn": "2020-08-25T07:27:58Z",
  "updatedBy": 451,
  "updatedOn": "2021-03-16T17:15:19Z",
  "publicKey": null,
  "appType": null,
  "routingName": null,
  "appUrl": null,
  "email": "Joe.Smith@automationanywhere.com",
  "lastLoginTime": "2021-02-25T18:01:40Z",
  "deviceCredentialAttested": false
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Delete an existing user API

Use the `Delete user` API to delete an existing user in the Control Room.

Ensure you have an admin role or a custom role with **Edit Users** permission.

- URL: `http://<your_control_room_url>/v1/usermanagement/users/2 <user ID>`

Replace the content in the angle brackets with your Control Room URL.

- Method: **DELETE**

1. Add the authentication token to the request header. Add an authentication token to the request header.
2. In the request header, add an existing user ID you want to delete.
3. Use the **DELETE** method. and endpoint URL: `<your_control_room_url>/v1/usermanagement/users/2 <user ID>`
4. Send the request.

### Response body:

```

{
  "id": 3014,
  "email": "a@a.com",
  "username": "docstest01",
  "domain": null,
  "firstName": null,
  "lastName": null,
  "version": 4,
  "principalId": 3014,
}

```

```

"deleted": false,
"roles": [],
"sysAssignedRoles": [],
"groupNames": [],
"permissions": [],
"licenseFeatures": [],
"emailVerified": true,
"passwordSet": false,
"questionsSet": false,
"enableAutoLogin": false,
"disabled": false,
"clientRegistered": false,
"description": null,
"createdBy": 2623,
"createdOn": "2020-01-31T17:33:16Z",
"updatedBy": 3215,
"updatedOn": "2020-03-22T22:51:48Z",
"publicKey": null,
"appType": null,
"routingName": null,
"appUrl": null
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Roles and permissions

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

Roles are a logical container for permissions and have interdependencies with bots, users, and licenses. Users with the `AAE_Admin` role can create custom roles and assign roles to users.

The following topics provide descriptions of the features and the necessary information to create and assign roles with the [User Management API](#).

### Related concepts

#### [Control Room APIs](#)

The Automation Anywhere Control Room provides various APIs that allow you to customize the way that you (and your bots) interact with Automation Anywhere. Users can perform tasks such as manage bot deployments, create and manage credentials in the Credential Vault, create and manage user accounts and roles, and create and manage queues.

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

## System-created roles

Automation 360 includes predefined roles that cannot be edited or deleted. Each role has the standard permissions, plus the permissions necessary to perform the tasks within the scope of that role.

## Standard permissions

All system-created roles include the following permissions:

- View dashboards

- View my in progress activity
- Manage my credentials and lockers
- Create standard attributes for a credential (except for Discovery Bot roles)
- View and manage my Bot runners, Bot creators, and devices
- View and manage my queues
- View users and roles basic information

## System-created roles

Use the role IDs in the table below to assign the role to a user in the [Create a new user API](#) or [Update an existing user details API](#) endpoints.

**Note:** The role IDs in the table below are applicable to an On-Premises Control Room only. Since the role IDs vary for each cloud Control Room, you must look up the role ID by navigating to **Administration** > **Roles** and clicking the role name. The URL is `https://<control_room>/#/admin/roles/allroles/2/edit`, where 2 is the role name.

Role ID	Name	Description
1	AAE_Admin	Allows access to all features, including creating other Admin users and access to all folders and files. The only role that can access Control Room settings.
2	AAE_Basic	Permissions to create credentials and set a standard attribute value, view and run their bots, view the Bot Store, register a device, and view packages.
3	AAE_Locker Admin	Can view all credentials and all lockers. They can change the owner of a credential that they do not own. For lockers they do not own, they can delete the locker, edit permissions, and remove credentials.
4	AAE_IQ Bot Validator	For a Bot Runner with an IQ Bot license. Permissions to access the IQ Bot Validator screen. Limited access to Control Room features.
5	AAE_Bot Insight Consumer	When combined with an Analytics license, this role grants the user the ability to view data in Bot Insight.
6	AAE_Bot Insight Expert	When combined with an Analytics license, this role grants the user the ability to view and manage data in Bot Insight.
9	AAE_IQ Bot Services	Permissions to access the IQ Bot console. Limited access to Control Room features.
10	AAE_Queue Admin	Permissions to view and manage all queues.

Role ID	Name	Description
11	AAE_Pool Admin	Permissions to view and manage all device pools. <hr/> <b>Note:</b> This role does not grant permission to view bots. <hr/>
12	AAE_Bot Insight Admin	The only role that can use Bot Insight APIs to access the data logged by the Control Room, and by a task during Production runs.
14	AAE_IQ Bot Admin	Allows access to all IQ Bot features.
15	AAE_Bot Store Publisher	Permissions to submit bot package or Digital Worker to Bot Store.
16	AAE_Bot Developer	Permissions view, run, and import their bots, create folders, manage packages, and download bots and Digital Workers from the Bot Store to their private workspace. <hr/> <b>Note:</b> This role does not grant permission to register a device, or check bots in or out of the public workspace. <hr/>
17	AAE_Discovery Bot Admin	Allows access to view all Discovery Bot processes. Manages the creation, deletion, and editing of processes.
18	AAE_Discovery Bot User	Allows access to view the assigned Discovery Bot process assigned to a user. Create and run the Discovery Bot recorder for assigned business processes. Permissions to view, edit, and delete a user's own recordings.
19	AAE_Discovery Bot Analyst	Allows access to view and edit all approved recordings from assigned users for a given process. Permissions for system generated aggregated view of recordings to view, create, edit, and delete views. Permissions to create, view, edit, and delete opportunities for assigned processes. Export the opportunity to a word document and convert to a bot.
74	AAE_Robotic Interface Admin	
75	AAE_Robotic Interface Manager	
76	AAE_Robotic Interface User	

**Related concepts**[Control Room APIs](#)

The Automation Anywhere Control Room provides various APIs that allow you to customize the way that you (and your bots) interact with Automation Anywhere. Users can perform tasks such as manage bot deployments, create and manage credentials in the Credential Vault, create and manage user accounts and roles, and create and manage queues.

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

## Administration permissions

Enable users to create and manage users and roles, to manage and update migrations, and to install Control Room licenses.

We recommend that you create individual roles with only specific administrative permissions. You can then assign the limited permission to users with just that specific permission requirement.

## Users and roles permissions

Permission ID	Action	Resource Type	Description
1	usermanagement	usermanagement	Users can only view all other users in the system. They cannot create, edit, or delete users. <hr/> <b>Note:</b> You must assign this permission before assigning the <code>createuser</code> , <code>updateuser</code> , or <code>deleteuser</code> permission. <hr/>
2	deleteuser	usermanagement	Users can delete other users the Control Room.
3	createuser	usermanagement	Users can create new users in the Control Room.
4	updateuser	usermanagement	Users can edit all users in the system.
62	rolesview	rolesmanagement	Users with this permission are able to view the roles in the Control Room. <hr/> <b>Note:</b> You must assign this permission before assigning the <code>rolesmanagement</code> permission. <hr/>
12	rolesmanagement	rolesmanagement	Users can view and manage all roles in the Control Room.
994	viewuserrolebasicinfo	usermanagement	Users can view basic information on users and roles.

## Migration permissions

Permission ID	Action	Resource Type	Description
123	view	migration	Users can view new migrations, but not run them  <b>Note:</b> You must assign this permission before assigning the <code>manage</code> migration permission
56	manage	migration	Users can view and run new migrations
124	updatestatus	migration	Allows Bot Runner <b>Run-as</b> user to update the bot conversion status in the Control Room

## Licenses permissions

Permission ID	Action	Resource Type	Description
20	licensemanagement	licensemanagement	Users can assign device licenses to other users.
49	licenseinstall	licensemanagement	Users can install Automation 360 licenses for the Control Room.
48	licenseuserallocation	licensemanagement	Users can view the license details for the Control Room.

**Note:** Only a user with the `AAE_Admin` role has the ability to view and manage settings in the Control Room. See [System-created roles](#).

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

### Related reference

#### [Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## API permissions

Enables access to Bot Insight APIs and the ability to generate an API key.

Permission ID	Action	Resource Type	Description
47	botinsightapi	api	Allows access to Bot Insight RESTful APIs to the data logged by the Control Room and by a task during production runs.
91	generateapikey	api	Users can generate an <b>apiKey</b> that can be used in the Authentication API.

Permission ID	Action	Resource Type	Description
			<p><a href="#">Authenticate with username and apiKey API</a></p> <hr/> <p><b>Note:</b> Users without the <code>generateapikey</code> permission can use APIs by authenticating using their username and password.</p> <p><a href="#">Authenticate with username and password API</a></p>

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

### Related reference

#### [Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Audit log permissions

View logs and details to record user activities. Enable users to view logs from the Control Room.

Permission ID	Action	Resource Type	Description
14	recentactivities	recentactivities	Users can view all audit log activity for the Control Room

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

### Related reference

#### [Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Automation Anywhere Robotic Interface (AARI) permissions

Assign AARI permissions to a custom role.

Permission ID	Action	Resource Type	Description
664	aaricrossteamrecaari	ari	View all teams and see the team members
665	aaricrossprocessreari	ari	View all processes and see team members and managers
662	aariteammanagemari	ari	Create and view teams, edit team names, descriptions, and process tags. Add new teams, team members, and assigned processes
663	aaritaskmanagemari	ari	Submit and view tasks from processes that are assigned to the team

Permission ID	Action	Resource Type	Description
661	aaicasemanagement	request	Create and view requests from processes that are assigned to the team
691	aaiglobalcasemanagement	request	View process requests and tasks. <hr/> <b>Note:</b> This permission does not grant the ability to create a request or submit a task
689	aaiglobalprocessmanagement	request	View checked-in public processes and assigned managers and teams, edit process tags, and assign managers and teams <hr/> <b>Note:</b> This permission does not grant the ability to create a process.
690	aaiglobalteammangement	request	View teams and assigned users, edit team names and descriptions. Add new processes, managers and users to a team <hr/> <b>Note:</b> This permission does not grant the ability to create a team.

## Bot and bot credential permissions

Enables users to access features for managing bots and the credentials used by bots.

## Bots permissions

Permission ID	Action	Resource Type	Description
29	view	repositorymanager	Allows users to view the bots they created and bots that were assigned to them. <hr/> <b>Note:</b> You must assign this permission before assigning any other bots permissions.
7	run	repositorymanager	Allows users to run the bots they created and bots that were assigned to them.
31	export	repositorymanager	Allows users to export bots and related bot dependencies for which they have download permission.
32	import	repositorymanager	Allows users to import bots and bot dependencies for which they have upload permission.
54	createfolders	repositorymanager	Allows users to create folders within the folders that they have access to.
55	renamefolders	repositorymanager	Allows users to rename the folders they have access to.

Permission ID	Action	Resource Type	Description
			<b>Note:</b> Only empty folders can be renamed.
1158	cancelcheckout	repositorymanager	Allows users to cancel bot checkout and unlock the file from the public repository.

## Credentials and lockers permissions

Permission ID	Action	Resource Type	Description
59	managecredentials	credentials	User can create, edit, and delete their own credentials. In addition, the user can interact with credentials from their assigned lockers. <b>Note:</b> All roles have this permission by default.
26	create	locker	User can create and manage their own lockers.
61	createstandard	credentialattribute	User can create a standard attribute for a credential that is shared across all users of that credential .
64	updateany	credentialattributevalue	User can view and edit attributes that belong to other users.
46	botautologinapi	credentialattributevalue	User can automate the login process to run bots remotely.

**Note:** A user with the `AAE_Locker Admin` role can view all credentials and lockers in the Control Room. See [System-created roles](#).

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

### Related reference

#### [Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Bot Store permissions

Enables users to view and manage Bot Store packages.

Permission ID	Action	Resource Type	Description
94	view	botstore	User can view Bot Store.
95	addfrom	botstore	User can add bot packages from Bot Store to their Control Room private workspace.

Permission ID	Action	Resource Type	Description
96	submit	botstore	User can submit bot packages to Bot Store.

**Related tasks**

[Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

**Related reference**

[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Dashboard and activity permissions

Enables all users to view dashboards. Activity permissions enable users to view, manage, and schedule bot activities.

### Dashboard and Activity Permissions

Permission ID	Action	Resource Type	Description
120	view	dashboard	View dashboard. <hr/> <b>Note:</b> All roles have this permission by default. <hr/>
58	myschedule	taskscheduling	All users can view their own activity. <hr/> <b>Note:</b> All roles have this permission by default. <hr/>
51	managemyschedule	taskscheduling	All users can pause, resume, or cancel their own activity and move their finished activities to history.
52	manageeveryoneschedule	taskscheduling	A user can monitor ongoing automations where a user has either run or schedule access on the respective bot. The user can monitor and manage ongoing automations.
28	view	taskscheduling	Users can see their scheduled bots regardless of which user scheduled the bot.
10	addschedule	taskscheduling	It requires permission to view and manage Bot Runners.
5	updateschedule	taskscheduling	Users can edit their scheduled bots, even if the bots are scheduled by a different user.

Permission ID	Action	Resource Type	Description
11	deleteschedule	taskscheduling	Users can delete schedules for any of their bots regardless of which users scheduled the bot.
53	manageallmyfolderschedules	taskscheduling	Users can view, edit, and delete all the schedules on the bot folders that the user has access to. This includes the schedules that the user created or schedules created by other users.
6	manageallschedules	taskscheduling	Users can view, edit, and delete all the schedules in the system. This includes the schedules that the user created or schedules created by other users.

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

### Related reference

#### [Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Devices permissions

Enable users to register, view, and manage devices used to run bots.

Permission ID	Action	Resource Type	Description
97	register	devices	Allows users to register a localhost device.
118	all	devices	Allows users to view and manage all devices in the Control Room.
119	delete	devices	Allows users to delete devices that they registered.
1191	edit	devices	Allows users to edit the devices that they have permission to see.
30	view	devices	Allows users to view and manage Bot Creators, Bot Runners, and device pools.  <b>Note:</b> All roles have this permission by default.
40	create	pool	Allows users to create and manage their own device pools.

**Note:** A user with the `AAE_Pool Admin` role is able to manage all device pools in the Control Room. See [System-created roles](#).

**Related tasks**[Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

**Related reference**[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Discovery Bot permissions

Enable users to view or manage Discovery Bot processes, recordings, aggregations, and opportunities.

### Process permissions

Permission ID	Action	Resource Type	Description
109	viewprocess	processdiscovery	Allows users to view assigned processes.  <b>Note:</b> This is the standard permission. You must assign this permission before assigning any process discovery permissions.
110	viewallprocess	processdiscovery	Allows users to view all the defined processes.
108	editprocess	processdiscovery	Allows users to create and edit processes.

### Recording permissions

Permission ID	Action	Resource Type	Description
102	viewrecording	processdiscovery	Allows users to view their own recording.  <b>Note:</b> You must assign this permission before assigning any of the permissions below.
112	createrecording	processdiscovery	Allows users to run recorder and create recording.
103	editrecording	processdiscovery	Allows users to edit their own recording.
104	deleterecording	processdiscovery	Allows users to delete their own recording.
111	viewallrecording	processdiscovery	Allows users to view all recordings.

## Aggregation permissions

Permission ID	Action	Resource Type	Description
291	viewmanualaggregations	processdiscovery	Allows users to view their own aggregations.
293	viewallaggregations	processdiscovery	Allows users to view all aggregations.
290	createdeletemanualaggregations	processdiscovery	Allows users to create and delete aggregations.
294	updatemanualaggregations	processdiscovery	Allows users to update aggregations.
292	viewssystemaggregations	processdiscovery	Allows users to view system aggregations.

## Opportunity permissions

Permission ID	Action	Resource Type	Description
105	viewopportunity	processdiscovery	Allows users to view opportunities within assigned process.  <b>Note:</b> You must assign this permission before assigning any of the opportunity permissions.
296	viewallopportunities	processdiscovery	Allows users to view all opportunities.
295	createdeleteopportunities	processdiscovery	Allows users to create and delete opportunities within the assigned process.
107	converttobot	processdiscovery	Allows users to convert an opportunity to a bot.
622	exportopportunity	processdiscovery	Allows users to export an opportunity.

### Related tasks

[Create a new role API](#)

Use `Create role API` to create a new role with permissions in the Control Room.

### Related reference

[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Event triggers permissions

Enable users to run bots automatically depending on a specific event, such as a new window opening. You can limit users ability to only view or to view and manage triggers.

Action	Description
view	Allows users to view event triggers.
manage	Allows users to view and manage event triggers.

Additionally, you must enable the view packages permission as well:

Action	Resource type	Description
view	packagemanager	Allows users to view packages

### Related tasks

[Create a new role API](#)

Use `Create role API` to create a new role with permissions in the Control Room.

### Related reference

[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

[Package manager permissions](#)

Enable users to view and manage packages.

## IQ Bot permissions

Enable users to view IQ Bot permissions, create and manage learning instances, import and export domains, and manage IQ Bot configuration settings and migration.

### IQ Bot permissions

Permission ID	Action	Resource Type	Description
69	viewiqbot	iqbot	Allows users to view the default dashboards in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any of the permissions below.

### Learning instance permissions

Permission ID	Action	Resource Type	Description
70	viewlearninginstance	iqbot	Allows users to view their learning instances in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any other learning instance permission.
79	viewlearninginstanceforanother	learninginstance	Allows users to view learning instances created by other users with the same role in the IQ Bot portal.
80	viewalllearninginstances	learninginstance	Allows users to view all learning instances in the IQ Bot portal.

Permission ID	Action	Resource Type	Description
73	launchvalidation	viewlearninginstance	Allows users to access the IQ Bot Validator to review and update documents with exceptions.
74	createlearninginstance	viewlearninginstance	Allows users to create learning instances in the IQ Bot portal.
75	editlearninginstance	viewlearninginstance	Allows users to edit learning instances in the IQ Bot portal.
76	deletelearninginstance	viewlearninginstance	Allows users to delete their learning instances in the IQ Bot portal.
77	sendlearninginstance	viewstopprodinstance	Allows users to send their learning instances to production in the IQ Bot portal.
78	trainlearninginstance	viewgroupinstance	Allows users to train their learning instance groups in the IQ Bot portal.

### Domains permissions

Permission ID	Action	Resource Type	Description
71	viewdomain	viewiqbot	Allows users to view all domains in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any other domain permissions.
81	createdomains	viewdomain	Allows users to create domains in the IQ Bot portal.
84	importdomains	viewdomain	Allows users to import domains in the IQ Bot portal.
85	exportdomains	viewdomain	Allows users to export domains in the IQ Bot portal.

### Administration permissions

Permission ID	Action	Resource Type	Description
72	viewadministration	viewiqbot	Allows users to access the <b>Administration</b> tab in the IQ Bot portal.  <b>Note:</b> You must assign this permission before assigning any other administration permissions.
86	viewandmanagesettings	viewadministration	Allows users to manage the IQ Bot portal advanced configuration settings.

Permission ID	Action	Resource Type	Description
87	viewandmanagement	migrationadministration	Allows users to access the migration utility to import and export learning instances in the IQ Bot portal.

**Related tasks**[Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

**Related reference**[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## MetaBot permission

MetaBots are obsolete in Automation 360. However, this permission is valid to ensure that all functionality previously available is supported in Automation 360.

**Access to MetaBot Designer**

Permission/feature ID is not available.

Bot Creator users can access MetaBot Designer to view, create, and update MetaBots.

---

**Note:** This feature is available for internal use only.

---

**Related reference**[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Package manager permissions

Enable users to view and manage packages.

Permission ID	Action	Resource Type	Description
92	view	packagemanager	Allows users to view packages.
93	manage	packagemanager	Allows users to view and manage packages.

**Related tasks**[Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

**Related reference**[Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Workload permissions

Enable users to create and manage workitems, workitem models, queues, and automations in the Control Room.

Permission ID	Action	Resource Type	Description
58	myschedule	taskscheduling	Allows users to view and manage their own schedules.
41	create	queue	Allows users to create and manage their own queues.
42	calculate	sla	Allows users to calculate workload Service Level Agreements (SLA).

**Note:** A user with the `AAE_Queue Admin` role has all the above permissions. In addition, the `AAE_Queue Admin` is able to manage all the queues in the Control Room. See [System-created roles](#).

### Related tasks

#### [Create a new role API](#)

Use `Create role` API to create a new role with permissions in the Control Room.

### Related reference

#### [Roles and permissions](#)

Assign roles from the Automation 360 Administration user interface or through the User Management API to enable users to access features. You can assign a system-created role or create a custom role with specific permissions.

## Workload Management API

Use the Workload Management (WLM) API to programmatically manage and create Work Item models, queues, Work Items, and automations in your Control Room.

**Note:** You can view the in the , but API functionality is limited. You need a licensed Edition to access the full functionality of the APIs.

### Prerequisites

To create a [Workload Management](#) automation process, ensure that you are allocated the following roles and permissions:

- `AAE_Pool Admin` role and `View all devices` permission
- `AAE_Queue Admin` role or `Create queues` permission
- `Run bot` permission
- `Run or schedule` permission on the bots folder
- `Device pool consumer` permission

### Create workload automation

#### 1. [Authenticate the user](#).

Use the POST method to generate an authentication JSON Web Token.

2. Create WLM queues:
  - a. [Create Work Item model API](#)
  - b. [Create queues API](#)
  - c. [Add queue owner or member API](#)
  - d. [Add queue participants API](#)
  - e. [Add queue consumer API](#)
  - f. [Add Work Items to the queue API](#)
3. [Create device pool API](#)
4. [Run bot with queue API](#)

## Retrieve WLM entities using list APIs

When you create WLM queues for workload automation (see previous section), you can use the Workload Management list APIs to retrieve a list of WLM entities such as Work Item models, queues, and Work Items in queues associated with the Control Room.

[Workload Management list APIs](#)

## Create Work Item model API

Define a Work Item structure (model) for processing in a queue. This enables you to manually upload the Work Item from the system in the absence of ready data in a file.

You must have the following:

- Create queues or AAE\_Queue Admin permission
- The endpoint URL: `<your_control_room_url>/v3/wlm/workitemmodels`

1. Use the POST method and endpoint URL: `<your_control_room_url>/v3/wlm/workitemmodels`.

Enter the parameters such as Work Item model **name**, **attribute** names, and **type** value in the request body to create a Work Item structure. The value of **type** can be `TEXT`, `NUMBER`, or `DATE`, depending on the **attribute** value format.

For example:

```
POST https://192.0.2.0/v3/wlm/workitemmodels
```

In this example, the Work Item model **name** is `Finance-template` and it includes the `first_name`, `last_name`, and `email` as **attributes**. For these attributes, use `TEXT` value as the **type** parameter.

### Request body:

```
{
  "name": "Finance-template",
  "attributes": [
    {
      "name": "first_name",
      "type": "TEXT"
    },
    {
```

```

    "name": "last_name",
    "type": "TEXT"
  },
  {
    "name": "email",
    "type": "TEXT"
  }
]
}

```

## 2. Send the request.

When the request is successful, the Work Item model **id** and the display column **id** are returned in the response. You will use these IDs when you create queues.

In this example, the response body returns the Work Item model **id** as 10 and the display column **id** as 59, 60, 61 for the `first_name`, `last_name`, and `email`, respectively.

### Response body:

```

{
  "id": 10,
  "createdBy": 24,
  "createdOn": "2020-05-26T06:14:27.520336200Z",
  "updatedBy": 24,
  "updatedOn": "2020-05-26T06:14:27.520336200Z",
  "tenantId": 1,
  "version": 0,
  "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c",
  "name": "fin",
  "attributes": [
    {
      "id": 59,
      "name": "first_name",
      "type": "TEXT"
    },
    {
      "id": 60,
      "name": "last_name",
      "type": "TEXT"
    },
    {
      "id": 61,
      "name": "email",
      "type": "TEXT"
    }
  ]
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

[Create queues](#)

### Related tasks

[List Work Item models](#)

Use the Work Item model list API to get the list of all the Work Item templates that are associated with the specified Control Room.

## Create queues API

A queue is one of the main building blocks of workload management (WLM). It holds specific sets of data that your bot is expecting for automation.

Ensure you have the following:

- Create queues or AAE\_Queue Admin permission
- The endpoint URLs:
  - <your\_control\_room\_url>/v3/wlm/queues
  - <your\_control\_room\_url>/v3/wlm/workitemmodels/list

1. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/wlm/queues.

Enter values for the following parameters to create a queue. Use the same **workItemModelId** and **displayColumnIds** that you received in response when you created the Work Item model.

---

**Note:** If you want to search or get a list of all the available **workItemModelId**, use the endpoint URL <your\_control\_room\_url>/v3/wlm/workitemmodels/list.

*List WLM queues*

---

For example:

```
POST https://192.0.2.0/v3/wlm/queues
```

In this example, use **workItemModelId** as 10 and **displayColumnIds** as 59, 60, 61.

**Request body:**

```
{
  "name": "Finance-Q",
  "description": "Queue for Finance",
  "reactivationThreshold": 1,
  "displayColumns": [
    "first_name",
    "last_name",
    "email"
  ],
  "workItemProcessingOrders": [
  ],
  "workItemModelId": 10,
  "displayColumnIds": [
    59,
    60,
    61
  ]
}
```

## 2. Send the request.

When the request is successful, a queue **id** is returned in the response body. This queue **id** will be used in the subsequent tasks when you add owners, participants, consumers, and Work Items in the queue.

In this example, the response body returns the queue **id** as 17.

### Response body:

```
{
  "id": "17",
  "createdBy": "24",
  "createdOn": "2020-05-26T06:13:57.644499300Z",
  "updatedBy": "24",
  "updatedOn": "2020-05-26T06:13:57.644499300Z",
  "tenantId": "1",
  "version": "0",
  "tenantUuid": "4db5b56c-5c2b-4aee-8ca0-f53ec241563c",
  "name": "Finance-Q",
  "description": "Queue for Finance",
  "reactivationThreshold": "1",
  "status": "NOT_IN_USE",
  "manualProcessingTime": "0",
  "manualProcessingTimeUnit": "",
  "workItemProcessingOrders": [
  ],
  "workItemModelId": "10",
  "displayColumnIds": [
    "59",
    "60",
    "61"
  ],
  "considerReactivationThreshold": false
}
```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

### [Add queue owner or member](#)

#### Related tasks

##### [List WLM queues](#)

Use the Workload Management queues list API to get the list of all the queues that are associated with the specified Control Room.

## Add queue owner or member API

Add queue owners who can create, edit, and view queues. The queue creator is the default queue owner and can add other Control Room users as queue owners if required.

You must have the following:

- Create queues or AAE\_Queue Admin permission

- The endpoint URLs:
    - `<your_control_room_url>/v3/wlm/queues/{queueId}/members/{userId}`
    - `<your_control_room_url>/v1/usermanagement/users/list`
    - `<your_control_room_url>/v3/wlm/queues/list`
1. Use the PUT method and endpoint URL: `<your_control_room_url>/v3/wlm/queues/{queueId}/members/{userId}`.

Enter the **queueId** to which you want to add the owner and the **userId** that will be the owner of the queue. This **queueId** is the same ID that was returned when you created the queue.

---

**Note:**

- If you want to search or get a list of all the available **queueId**, use the endpoint URL `<your_control_room_url>/v3/wlm/queues/list`.

[List WLM queues](#)

- If you want to search or get a list of all the **userId**, use the endpoint URL: `<your_control_room_url>/v1/usermanagement/users/list`.

[Search for users API](#)

---

For example, use **queueId** as 17 and **userId** as 1.

```
PUT https://192.0.2.0/v3/wlm/queues/17/members/1
```

Add one or more **permissions** in the request body to allow the user to perform the specific queue actions. In this example, `manage` and `own` permissions are added.

**Request body:**

```
{
  "permissions": [
    "manage",
    "own"
  ]
}
```

2. Send the request.  
When the request is successful, the required user is added as a queue owner.  
In this example, the user with **userId** as 1 is added as a queue owner.

**Response body:**

```
{
  "id": 1,
  "permissions": [
    "own",
    "manage"
  ]
}
```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

[Add queue participants](#)

## Add queue participants API

Add queue participants from different roles defined in the Control Room.

You must have the following:

- Create queues or AAE\_Queue Admin permission
- The endpoint URLs:
  - `<your_control_room_url>/v3/wlm/queues/{queueId}/participants`
  - `<your_control_room_url>/v3/wlm/queues/list`

1. Use the POST method and endpoint URL: `<your_control_room_url>/v3/wlm/queues/{queueId}/participants`.

Enter the **queueId** to which you want to add the participants. This **queueId** is the same ID that was returned when you created the queue.

---

**Note:** If you want to search or get a list of all the available **queueId**, use the endpoint URL `<your_control_room_url>/v3/wlm/queues/list`.

[List WLM queues](#)

---

For example, use **queueId** as 17.

```
POST https://192.0.2.0/v3/wlm/queues/17/participants
```

Enter one or more role **id** in the request body that you want to add as queue participants. In this example, one role **id** as 21 is added as queue participant.

### Request body:

```
[
  {
    "id": 21
  }
]
```

2. Send the request.

When the request is successful, the participants are added to the queue.

In this example, the participant with role **id** as 21 is added to the queue.

### Response body:

```
[
  {
    "id": 21,
    "createdBy": null,
    "createdOn": null,
    "updatedBy": null,
    "updatedOn": null,
    "tenantId": null,
    "version": 0,
    "tenantUuid": null,
    "description": null,
    "name": null,
    "accessRestriction": null,
    "permissions": [
    ],
  },
]
```

```

    "countPrincipals": 0,
    "principals": [
      ]
    }
  ]

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

### Add queue consumer

## Add queue consumer API

Add queue consumers from different roles defined in the Control Room.

You must have the following:

- Create queues or AAE\_Queue Admin permission
- The endpoint URLs:
  - <your\_control\_room\_url>/v3/wlm/queues/{queueId}/consumers
  - <your\_control\_room\_url>/v3/wlm/queues/list

1. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/wlm/queues/{queueId}/consumers.

Enter the **queueId** to which you want to add the consumers. This **queueId** is the same ID that was returned when you created the queue.

---

**Note:** If you want to search or get a list of all the available **queueId**, use the endpoint URL <your\_control\_room\_url>/v3/wlm/queues/list.

### List WLM queues

---

For example, use **queueId** as 17.

```
POST https://192.0.2.0/v3/wlm/queues/17/consumers
```

Enter one or more role **id** in the request body that you want to add as queue consumers. In this example, one role **id** as 21 is added as queue consumer.

### Request body:

```

[
  {
    "id": 21
  }
]

```

2. Send the request.

When the request is successful, the consumers are added to the queue.

In this example, the consumer with role **id** as 21 is added to the queue.

### Response body:

```

[
  {
    "id": 21,

```

```

    "createdBy": null,
    "createdOn": null,
    "updatedBy": null,
    "updatedOn": null,
    "tenantId": null,
    "version": 0,
    "tenantUuid": null,
    "description": null,
    "name": null,
    "accessRestriction": null,
    "permissions": [
    ],
    "countPrincipals": 0,
    "principals": [
    ]
  }
]

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

### [Add Work Items to the queue](#)

## Add Work Items to the queue API

Add or insert Work Items to an existing queue in the Control Room per the defined model or structure.

- The user must be a Queue owner and participant
- You must have the endpoint URLs:
  - `<your_control_room_url>/v3/wlm/queues/{queueId}/workitems`
  - `<your_control_room_url>/v3/wlm/queues/list`

1. Use the POST method and endpoint URL: `<your_control_room_url>/v3/wlm/queues/{queueId}/workitems`.

Enter the **queueId** to which you want to add a Work Item in the queue.

---

**Note:** If you want to search or get a list of all the available **queueId**, use the endpoint URL `<your_control_room_url>/v3/wlm/queues/list`.

### [List WLM queues](#)

---

For example, use **queueId** as 17.

```
POST https://192.0.2.0/v3/wlm/queues/17/workitems
```

Enter one or more **workitems** in the request body. To add multiple Work Items, call the API in a loop.

### **Request body:**

```

{
  "workItems": [
    {
      "json": {
        "first_name": "Jane",
        "last_name": "Doe",
        "email": "jane.doe@example.com"
      }
    }
  ]
}

```

```

    }
  ]
}

```

## 2. Send the request.

When the request is successful, a unique Work Item **id** is returned in the response body and the Work Items are added to the queue per the defined Work Item model or structure.

In this example, the Work Item with the **first\_name** as Jane, **last\_name** as Doe, and **email** as jane.doe@example.com is added to the queue based on the defined structure.

### Response body: (truncated output)

```

{
  "id": 77,
  "createdBy": 24,
  "createdOn": "2020-05-19T17:41:57.602092100Z",
  "updatedby": 24,
  "updatedOn": "2020-05-26T09:13:31.090241700Z",
  "version": 2,
  "json": {
    "first_name": "Jane",
    "last_name": "Doe",
    "email": "jane.doe@example.com"
  },
  "result": "",
  "deviceId": 0,
  "status": "NEW",
  "col1": "1.0",
  "col2": "",
  "...": "...",
  "co21": "",
  "deviceUserId": 0,
  "queueId": 5,
  "comment": "",
  "automationId": 0,
  "totalPausedTime": 0,
  "error": ""
}

```

## 3. Optional: If you want to update the Work Item data, when the automation is running, you need to perform the following steps:

- a) Pause the automation. Use the PUT method and the following endpoint URL:  
 <your\_control\_room\_url>/v3/wlm/automations/{id}
- b) Update the Work Item by using queue ID and Work Item ID. Use the PUT method and the following endpoint URL: <your\_control\_room\_url>/v3/wlm/queues/{id}/workitems/{workitemId}
- c) Resume the automation. Use the PUT method and the following endpoint URL:  
 <your\_control\_room\_url>/v3/wlm/automations/{id}

*Create an automation to run a bot with a queue*

### Related tasks

[List Work Items in queue](#)

Use the Workload Management Work Item list API to get the list of all the Work Items in the queues that are associated with the specified Control Room.

## Run bot with queue API

Create an automation to collectively process all the Work Items of a queue across all the Bot Runners present in one or more device pools using the API.

- You must have the following permissions:
  - Run bot
  - Run or schedule permission on the bot folder
  - Queue consumer
  - Device pool consumer
- You must have the endpoint URLs:
  - `<your_control_room_url>/v3/wlm/automations`
  - `<your_control_room_url>/v1/usermanagement/users/list`
  - `<your_control_room_url>/v3/wlm/queues/list`
  - `<your_control_room_url>/v2/devices/pools/list`
- 1. Use the POST method and endpoint URL: `<your_control_room_url>/v3/wlm/automations`. Enter parameters such as **name** of the automation, **fileId**, **filename**, **queueID**, **queueName**, **runAsUserIds**, and **poolId**.
  - If you want to search or get a list of all the available **queueId**, use the endpoint URL `<your_control_room_url>/v3/wlm/queues/list`.  
*List WLM queues*
  - If you want to search or get a list of all the **runAsUserIds**, use the endpoint URL: `<your_control_room_url>/v1/usermanagement/users/list`.  
*Search for users API*
  - If you want to search or get a list of all the **poolId**, use the endpoint URL: `<your_control_room_url>/v2/devices/pools/list`.  
*List device pools API*

In this example, the parameters are entered as follows:

- Automation **name** as `Finance-RPA-Run`
- Bot **fileName** as `wlmq1`
- **runAsUserIds** as 4 and 5 that will log in to the device to run the automation
- **queueID** as 17, associated with the queue to run the automation
- **poolId** as 1 that is associated with the pool

### Request body:

```
{
  "name": "Finance-RPA-Run",
  "automationName": "Finance-RPA-Run",
  "fileName": "wlmq1",
  "botInput": {

  },
  "status": "ACTIVE",
  "description": "WLM for Finance",
```

```

"rdpEnabled": false,
"setAsDefaultDevice": false,
"poolIds": [
],
"workspaceName": "public",
"timeZone": "Asia/Calcutta",
"runAsUserIds": [
  "4",
  "5"
],
"queueId": "17",
"poolId": "1"
}

```

## 2. Send the request.

When the request is successful, a unique automation **id** is returned in the response body after the WLM automation run successfully. The details of the associated queue name and ID, and the user name IDs for which the automation is run are also provided.

In this example, the response body returns the unique automation **id** as 12.

### Response body:

```

{
  "id": "12",
  "name": "Finance-RPA-Run",
  "status": "ACTIVE",
  "description": "WLM for Finance",
  "rdpEnabled": false,
  "priority": "1",
  "queueId": "17",
  "queueName": "Finance-Q",
  "poolId": "1",
  "runAsUserIds": [
    "4",
    "5"
  ],
  "fileId": "17",
  "startedOn": "2020-05-26T09:42:51.958893800Z",
  "startedBy": "24",
  "createdBy": "24",
  "createdOn": "2020-05-26T09:42:51.958893800Z",
  "updatedBy": "24",
  "updatedOn": "2020-05-26T09:42:51.958893800Z",
  "tenantId": "1",
  "version": "0",
  "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c"
}

```

The REST API responds to each request with an HTTP response code. For details about the response codes, see [API response codes](#).

## Workload Management list APIs

List APIs use the POST method to return the list of the entities. You can use the Workload Management (WLM) list APIs and get the list of WLM entities, for example, Work Item models, queues, and Work Items in the queues.

Use the following Workload Management APIs to get the list of the WLM entities:

- [List Work Item models](#)

- [List WLM queues](#)
- [List Work Items in queue](#)

## List Work Item models

Use the Work Item model list API to get the list of all the Work Item templates that are associated with the specified Control Room.

You must have the following:

- Queue Consumer permission
- An authentication token for a user registered in the Control Room

### [Authentication API](#)

- The endpoint URL: `<your_control_room_url>/v3/wlm/workitemmodels/list`

1. Use the POST method to generate an authentication JSON Web Token.

### [Authentication API](#)

2. Use the POST method and endpoint URL: `<your_control_room_url>/v3/wlm/workitemmodels/list`. Use the following URL and leave the request body blank to request information about all available Work Item models:

```
https://192.0.2.0/v3/wlm/workitemmodels/list
```

### Request body:

```
{}
```

3. Send the request.
  - In the REST Client, click **SEND**.
  - In the Swagger interface, click **Execute**.

Because there is no filtering used in the request, a successful response returns all of the queues for the specified Control Room. In this example, the response returned data for two Work Item models.

### Response body:

```
{
  "page": {
    "offset": 0,
    "total": 50,
    "totalFilter": 50
  },
  "list": [
    {
      "id": "1",
      "name": "q1",
      "attributes": [
        {
          "name": "Customer Name",
          "type": "TEXT",
          "id": "2"
        },
        {
          "name": "email",
          "type": "TEXT",
          "id": "4"
        }
      ]
    }
  ]
}
```

```

    ]
  },
  {
    "id": "2",
    "name": "q2",
    "attributes": [
      {
        "name": "Customer Name",
        "type": "TEXT",
        "id": "7"
      },
      {
        "name": "email",
        "type": "TEXT",
        "id": "9"
      }
    ]
  }
]
}

```

### Related tasks

#### [Create Work Item model API](#)

Define a Work Item structure (model) for processing in a queue. This enables you to manually upload the Work Item from the system in the absence of ready data in a file.

### List WLM queues

Use the Workload Management queues list API to get the list of all the queues that are associated with the specified Control Room.

You must have the following:

- Queue Consumer permission
- An authentication token for a user registered in the Control Room

#### [Authentication API](#)

- The endpoint URL: `<your_control_room_url>/v3/wlm/queues/list`

Leave the request body blank to request information on all available queues. Add one or more filter parameters in the request body to limit the information returned from all available WLM queues.

### Supported filterable parameters:

#### **id**

The numeric identifier for a queue.

- **Field:** id
- **Type:** integer

```

{
  "filter": {
    "operator": "eq",
    "value": "7",
    "field": "id"
  }
}

```

#### **name**

The name of the queue.

- **Field:** name

- **Type: string**

```
{
  "filter": {
    "operator": "substring",
    "value": "Finance",
    "field": "name"
  }
}
```

**status**

The status of queue for example: Draft, In use, or Not in use.

- **Field: status**
- **Type: string**

```
{
  "filter": {
    "operator": "eq",
    "value": "IN_USE",
    "field": "status"
  }
}
```

1. Use the POST method to generate an authentication JSON Web Token.

*Authentication API*

2. Use the POST method and end point URL: <your\_control\_room\_url>/v3/wlm/queues/list  
For example, use the following Control RoomURL:

```
https://192.0.2.0/v3/wlm/queues/list
```

Use filters in the request body to retrieve the list of all the queues that are IN\_USE status and have Finance in their name.

**Request body:**

```
{
  "sort": [
    {
      "field": "name",
      "direction": "asc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "eq",
        "value": "IN_USE",
        "field": "status"
      },
      {
        "operator": "substring",
        "value": "Finance",
        "field": "name"
      }
    ]
  },
  "fields": [
```

```

],
"page": {
  "offset": 0,
  "total": 14,
  "totalFilter": 10,
  "length": 100
}
}

```

### 3. Send the request.

- In the REST Client, click **SEND**.
- In the Swagger interface, click **Execute**.

The response returns all the details of the queue that has `Finance` in their name and `IN_USE` as status.

#### Response body:

```

{
  "page": {
    "offset": 0,
    "total": 14,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "12",
      "createdBy": "24",
      "createdOn": "2020-05-19T18:37:11.713311Z",
      "updatedBy": "24",
      "updatedOn": "2020-05-19T19:14:13.641004200Z",
      "tenantId": "1",
      "version": "11",
      "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c",
      "name": "Finance WLM",
      "description": "Finance WLM Automation",
      "reactivationThreshold": "1",
      "status": "IN_USE",
      "manualProcessingTime": "0",
      "manualProcessingTimeUnit": "SECONDS",
      "workItemProcessingOrders": [
        {
          "columnId": "37",
          "priority": "1",
          "name": "",
          "sortDirection": "desc",
          "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c"
        },
        {
          "columnId": "38",
          "priority": "2",
          "name": "",
          "sortDirection": "asc",
          "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c"
        },
        {
          "columnId": "39",
          "priority": "3",
          "name": "",
          "sortDirection": "desc",
          "tenantUuid": "4db5b32c-5c4b-4aee-8ca0-f53ec241563c"
        }
      ]
    }
  ]
}

```

```

    }
  ],
  "workItemModelId": "7",
  "displayColumnIds": [
    "36",
    "37",
    "38",
    "39",
    "40"
  ],
  "considerReactivationThreshold": false
}
]
}

```

## Related tasks

### [Create queues API](#)

A queue is one of the main building blocks of workload management (WLM). It holds specific sets of data that your bot is expecting for automation.

## List Work Items in queue

Use the Workload Management Work Item list API to get the list of all the Work Items in the queues that are associated with the specified Control Room.

You must have the following:

- Queue Consumer permission
- An authentication token for a user registered in the Control Room

### [Authentication API](#)

- The endpoint URL: <your\_control\_room\_url>/v3/wlm/queues/{queueId}/workitems/list

Leave the request body blank to request information on all available Work Items. Add one or more filter parameters in the request body to limit the information returned from all available WLM Work Items.

## Supported filterable parameters:

### status

The status of queue for example: New, On hold, Failed, Completed, Data error, Active, and Ready to run.

- **Field:** status
- **Type:** string

```

{
  "filter": {
    "operator": "eq",
    "value": "ACTIVE",
    "field": "status"
  }
}

```

### result

The Work Item result string. For example, the Work Item was completed or skipped.

- **Field:** result

- **Type: string**

```
{
  "filter": {
    "operator": "substring",
    "value": "skipped",
    "field": "result"
  }
}
```

**col**

The column number corresponding to the custom column name. For example, email, firstname, and lastname.

- **Field: col**
- **Type: string**

```
{
  "filter": {
    "operator": "substring",
    "value": "Brian",
    "field": "col1"
  }
}
```

1. Use the POST method to generate an authentication JSON Web Token.

*Authentication API*

2. Use the POST method and endpoint URL: <your\_control\_room\_url>/v3/wlm/queues/{queueId}/workitems/list  
For example, enter the queueId as 20 in the following URL for which you want to get the Work Items:

```
https://192.0.2.0/v3/wlm/queues/20/workitems/list
```

Use filters in the request body to retrieve the list of all the Work Items that are in **NEW** status and have **Brian** in their **first\_name (col1)**.

**Request body:**

```
{
  "sort": [
    {
      "field": "computedStatus",
      "direction": "asc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "eq",
        "value": "NEW",
        "field": "status"
      },
      {
        "operator": "substring",
        "value": "Brian",
        "field": "col1"
      }
    ]
  }
}
```

```

    ],
    "fields": [
    ],
    "page": {
      "offset": 0,
      "total": 5,
      "totalFilter": 1,
      "length": 100
    }
  }
}

```

### 3. Send the request.

- In the REST Client, click **SEND**.
- In the Swagger interface, click **Execute**.

The response returns all the details of the Work Item that has `Brian` in their `first_name` (`col1`) and status is `NEW`.

#### Response body:

```

{
  "page": {
    "offset": 0,
    "total": 5,
    "totalFilter": 1
  },
  "list": [
    {
      "id": "11804",
      "createdBy": "24",
      "createdOn": "2020-05-26T10:19:34.786711300Z",
      "updatedBy": "24",
      "updatedOn": "2020-05-26T10:19:34.786711300Z",
      "version": "1",
      "json": {
        "id": "1",
        "first_name": "Brian",
        "last_name": "Matthews",
        "email": "bmatthews0@example.com",
        "gender": "Male",
        "Address": "5773 Meadow Ridge Street",
        "Current Balance": "822034.72",
        "Current Card Type": "jcb",
        "Average Bank Balance": "$1,25,365.58 ",
        "Account Number": "1651249",
        "Amount Requested": "12750",
        "Recommended": "6375",
        "Phone": "8607826062"
      },
      "result": "",
      "deviceId": "0",
      "status": "NEW",
      "col1": "Brian",
      "col2": "Matthews",
      "col3": "bmatthews0@example.com",
      "col4": "",
      "col5": "",
      "deviceUserId": "0",
      "queueId": "20",
      "comment": ""
    }
  ]
}

```

```

    "automationId": "0",
    "totalPausedTime": "0",
    "error": "",
    "col6": "",
    "col7": "",
    "col8": "",
    "col9": "",
    "col10": ""
  }
]
}

```

### Related tasks

#### [Add Work Items to the queue API](#)

Add or insert Work Items to an existing queue in the Control Room per the defined model or structure.

## Filters in an API request body

Filtering provides basic conditional queries and page control for processing API requests. There are three basic components to filtering: conditions, sorting, and pagination parameters.

### Understanding filters

#### Basic filter

User filters to search for a single condition or they can be wrapped in logical operands AND and OR. User filtering for a simple conditional evaluation of a single field. The values that are used in a filter, such as, an operator and a field are specific to the API they are used in.

Default values are presented in the angle brackets < >. Use only one value for each parameter.

#### Single parameter filter

```

{
  "filter": {
    "operator": "<NONE, lt, le, eq, ne, ge, gt, substring, and, or, not>",
    "field": "string",
    "value": "string"
  }
}

```

#### Two parameter filter

```

{
  "filter": {
    "operator": "<and, or>",
    "operands": [
      {
        "operator": "<NONE, lt, le, eq, ne, ge, gt, substring, and, or,
not>",
        "field": "string",
        "value": "string"
      },
      {
        "operator": "<NONE, lt, le, eq, ne, ge, gt, substring, and, or,
not>",
        "field": "string",
        "value": "string"
      }
    ]
  }
}

```

```

    ]
  }
}

```

Operation	Description	Example
lt	Less than	Quantity lt 1500
le	Less Than or Equal	Quantity le 1500
eq	Equals	UserEmailAddress, eq first.last@aa.com
ne	Not Equals	UserEmailAddress, ne first.last@aa.com
ge	Greater Than or Equal	CreatedDateUtc ge 2021-03-15
gt	Greater Than	CreatedDateUtc gt 2021-03-15
and	And	Field1 eq 'abc' and Field2 eq 'def'
or	Or	Field1 eq 'abc' or Field2 eq 'def'

### Page

```

"page": {
  "offset": 0,
  "length": 0
}

```

### Pagination rules parameters

- **Offset:**  
Type: integer  
The numeric value that indicates how many rows into a table that the filter starts evaluating.
- **Length**  
Type: integer  
The number of lines that are returned in a single page of results.

### Sort

```

"sort": [
  {
    "field": "string",
    "direction": "<asc, desc>"
  }
]

```

- **Field:** The field that you want the results to be filtered by. This must be a supported filterable field. Filterable fields vary depending on the API.
- **Direction**  
Type: Enum [ desc, asc ]
  - asc = ascending (smallest to largest, 0 to 9, A to Z)
  - desc = descending (largest to smallest, 9 to 0, Z to A)

## API filter examples

- *User management filter example*

This example filter is based on the User Management API fields and parameters. This filter searches for the user login name, username, and the user firstName.

- *Repository management filter example*

This example filter is based on the Repository Management API fields and parameters. This filter example searches the bot status and the name.

- *Migration list results filter example*

This example filter is based on the Migration API fields and parameters. This filter searches for migrations that contain a specific field in the name and was started, updatedOn, between two dates.

## User management filter example

This example filter is based on the User Management API fields and parameters. This filter searches for the user login name, username, and the user firstName.

This filter searches for the "bot-creator" in the username field and "Adweta" in the firstName field.

```
{
  "sort": [
    {
      "field": "username",
      "direction": "asc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "substring",
        "value": "bot-creator",
        "field": "username"
      },
      {
        "operator": "substring",
        "value": "Adweta",
        "field": "firstName"
      }
    ]
  }
}
```

### sort

- field: the name of the field used to sort the response.
- direction: the sort order. It can be asc, ascending, or desc, descending.

### filter

Filter consists for an operator, value, and field. Filters are operands when used in conjunction with a boolean operator, such as and.

- operands: filters are used as operands when combined in a filter by using a boolean operator. There are two available boolean operators:
  - **or**: one of the conditions must be met.
  - **and**: all of the conditions must be met.
- operator: there are 11 operators `NONE`, `lt`, `le`, `eq`, `ne`, `ge`, `gt`, `substring`, `and`, `or`, `not`. **And** and **or** are used to evaluate multiple filters together. The other operators are used to evaluate values within individual filters. Not all operators work with all fields.
- field: the name of the field used in the filter.
- value: the value of the field to be evaluated.

## Repository management filter example

This example filter is based on the Repository Management API fields and parameters. This filter example searches the bot status and the name.

This filter searches for bots in the Control Room repository with the string "finance" in the name of the file that have a status of "CHECKED\_OUT."

---

**Note:** The Repository management API uses role based access. That means users can only see the files and folders to which they have access.

---

```
{
  "sort": [
    {
      "field": "directory",
      "direction": "desc"
    },
    {
      "field": "name",
      "direction": "asc"
    }
  ],
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "substring",
        "value": "finance",
        "field": "name"
      },
      {
        "operator": "eq",
        "value": "CHECKED_OUT",
        "field": "botStatus"
      }
    ]
  }
}
```

### sort

- field: the name of the field used to sort the response.

**filter**

- direction: the sort order. It can be asc, ascending, or desc, descending.

Filter consists for an operator, value, and field. Filters are operands when used in conjunction with a boolean operator, such as and.

- operands: filters are used as operands when combined in a filter by using a boolean operator. There are two available boolean operators:
  - **or**: one of the conditions must be met.
  - **and**: all of the conditions must be met.
- operator: there are 11 operators `NONE`, `lt`, `le`, `eq`, `ne`, `ge`, `gt`, `substring`, `and`, `or`, `not`. **And** and **or** are used to evaluate multiple filters together. The other operators are used to evaluate values within individual filters. Not all operators work with all fields.
- field: the name of the field used in the filter.
- value: the value of the field to be evaluated.

## Migration list results filter example

This example filter is based on the Migration API fields and parameters. This filter searches for migrations that contain a specific field in the name and was started, `updatedOn`, between two dates.

This filter searches for migrations that contain "doc" in the name and were started between March 8, 2021 at midnight and March 13, 2021 at midnight.

```
{
  "filter": {
    "operator": "and",
    "operands": [
      {
        "operator": "gt",
        "field": "updatedOn",
        "value": "2021-03-08T00:00:00.001Z"
      },
      {
        "operator": "substring",
        "field": "name",
        "value": "doc"
      },
      {
        "operator": "lt",
        "field": "updatedOn",
        "value": "2021-03-13T00:00:00.001Z"
      }
    ]
  }
}
```

**filter**

Filter consists for an operator, value, and field. Filters are operands when used in conjunction with a boolean operator, such as and.

- operands: filters are used as operands when combined in a filter by using a boolean operator. There are two available boolean operators:
  - **or**: one of the conditions must be met.
  - **and**: all of the conditions must be met.
- operator: there are 11 operators `NONE`, `lt`, `le`, `eq`, `ne`, `ge`, `gt`, `substring`, `and`, `or`, `not`. **And** and **or** are used to evaluate multiple filters together. The other operators are used to evaluate values within individual filters. Not all operators work with all fields.
- field: the name of the field used in the filter.
- value: the value of the field to be evaluated.

## API response codes

Review the HTTP status codes of responses for Automation 360 APIs.

Status code	HTTP name	Description
200	OK	Success
202	Accepted	Indicates that the request has been accepted for processing, but the processing has not been completed.
204	No content	Success, an API returned no content.
400	Bad request	Request URL or request parameters are incorrect.
401	Authentication required	Provide authentication details.
403	Unauthorized access	The operation is not authorized.
404	Not found	Control Room server did not find the requested URL.
409	Conflict	The request could not be completed because the code conflicts with the current state of the resource, for example, a duplicate entry.
500	Internal server error	Indicates that the server encountered a problem. Clear the cookies and cache, and then reload the page.

# Optimize

---

Bot Insight is an analytics platform that provides real-time, interactive, and smart insights about business processes and operational intelligence. Bot Insight is available with out-of-the-box dashboards that you can start using instantly. These dashboards provide analyzes to measure the performance of your digital workforce and predict and solve preventable business problems.

## Business analytics through Bot Insight

Automation Anywhere Bot Insight processes real-time and interactive insights about business processes, and provides operational intelligence. Access the bots, and manage and instrument them to gather business analytics and insights, and publish dashboards.

1. *Create and edit bots*

The cloud-based bot editor provides tools, packages, and actions to create bots to automate processes.

2. *Instrument the bot for analytics*

Business analytics provides information about the transactional analytics for the data that is logged by the variables that are tagged in a task. The information provided can be about the total sales in a month, invoicing and payment trends, insight about new customers, and quote-to-order ratio.

3. *Access Bot Insight*

Access Bot Insight to perform the business analytics.

4. *Customize dashboards and widgets*

Dashboards represent the RPA infrastructure in the form of meaningful visuals and charts, so that you can analyze, interpret, and take action on the updates that are important to you. The dashboards display dynamically updated information of active users, registered clients, failed tasks, apps, bots, bot schedules, workflows, queues, and the overall status of devices.

5. *Publish a business analytics dashboard*

Publish a dashboard to display the production data generated by the task. The analytics consumers who primarily analyze and interpret data can access the published dashboard.

To learn more, search for the *Managing RPA Reports Using Automation 360* course in [Automation Anywhere University: RPA Training and Certification \(A-People login required\)](#).

### **Related concepts**

[Bot Insight dashboards](#)

The Bot Insight dashboards provide dedicated graphical insight to help you view your bot information.

### **Related tasks**

[Run your first bot](#)

Run a bot from the same device that you used to create the bot.

### **Related reference**

[Analyze package](#)

Use the actions in the **Analyze** package to specify the actions and variables to use in the Bot Insight dashboard and widgets. The **Analyze** package enables you to perform transactional analytics for the data that is logged by the variables when the bot runs.

## Accessing Bot Insight

This section provides information about how to access Bot Insight.

To use Bot Insight, the Control Room must have the Bot Insight license applied, and you must be logged in as a user with one of the following roles:

1. AAE\_Bot Insight Expert
2. AAE\_Bot Insight Consumer
3. AAE\_Bot Insight Admin

## Access Bot Insight from the Control Room

Access Bot Insight to interactively analyze bot data and enhance bot widgets.

Access Bot Insight from the Control Room in one of the following ways:

- From the Control Room, select **Dashboard**.
  - a) Locate the **Insights** tab.
  - b) In the **Insights** tab, click **Explore Bot Insight**.  
The Bot Insight window appears.
- From the **Bots** menu, click **My Bots**:
  - a) In the **My Bots** window, click **PUBLIC** to view the public bots that can be viewed, run, and checked out by other people, based on the permissions set by the administrator.
  - b) Click **PRIVATE** to view your bots and files.

---

**Note:** Private bots and files cannot be viewed by other users. If a bot or file is checked out from the **PUBLIC** tab, it can be viewed and run by other users. However, the bots and files cannot be edited by other users.

---

- c) Select your bot from the **Files and Folders** menu.  
Alternatively, enter the search parameters in the **Search Name** field and search for your bot.
- d) Open the bot and click **Analyze**.  
The Bot Insight window appears.

## Roles to access Bot Insight

The Control Room restricts Bot Insight access to users with certain roles.

Access to the dashboard depends on the user roles assigned to a user and the access permission granted to those user roles. See [Role-Based Access Control](#).

Apart from the Bot Creators, users with the following user roles have access to business analytics dashboards:

### **Bot Insight Admin**

Use this role to perform the following operations in Bot Insight:

- View the Data Profile of the task data for which the dashboard report is generated.
- Analyze and save the system-generated dashboards.
- Analyze, save, publish, and delete the user-generated dashboards and publish dashboards.
- Bookmark, compare, and share the dashboards.

### **Bot Insight Expert**

Use this role to perform the following operations in Bot Insight:

- Analyze the data in the dashboards that are deployed in the production environment.
- Save the system-generated dashboards.
- Analyze, save, publish, and delete the user-generated dashboards and publish dashboards.
- Bookmark, compare, and share the dashboards.

### **Bot Insight Consumer**

Use this role to perform the following operations in Bot Insight:

- Analyze the data in the dashboards that are deployed in the production environment.
- Bookmark, compare, and share the publish dashboards.

## Role-based access control in Bot Insight

Role-based access control (RBAC) enables a Control Room administrator to restrict access to the various components of Bot Insight.

The Control Room administrator can grant access to various user roles based on your requirements. When adding a user, you assign appropriate roles to that user. A user will have access to the components and folders based on the roles assigned to them.

### RBAC for business analytics

Dashboards for business analytics are available for the tasks that are enabled for analytics. The Control Room administrator and users who have access to a task can view the dashboards for those tasks. You can access the dashboard for a task from the **Insight** tab in the **DASHBOARD** section of the Control Room and from the **ANALYZE** tab in the Workbench.

To view the Bot Insight dashboards, you must be granted access to the folder containing the corresponding tasks.

For example, you have created various tasks related to sales and accounting and stored them in the Sales and Accounts folder. If you want to grant access to the sales-related tasks to members of your sales department, you need to provide them access to the Sales folder. The same applies to grant access to the accounts-related tasks in the Accounts folder.

The following table illustrates the access the various members of the Sales and Accounts team will have:

	Sales_Dep			Accounts_Team	
	John	Mark	Dave	Smith	Micheal
Access to the <b>Sales</b> folder	Yes	Yes	Yes	No	No
<b>Sales1</b>	Yes	Yes	Yes	No	No
<b>Sales2</b>	Yes	Yes	Yes	No	No
Access to the <b>Accounts</b> folder	No	No	No	Yes	Yes
<b>Accounts1</b>	No	No	No	Yes	Yes
<b>Accounts2</b>	No	No	No	Yes	Yes
<b>Accounts3</b>	No	No	No	Yes	Yes

## Bot Insight dashboards

The Bot Insight dashboards provide dedicated graphical insight to help you view your bot information.

Dashboards represent the RPA infrastructure in the form of meaningful visuals and charts so that you can analyze, interpret, and take action on the updates that are important to you. You can use dynamically updated information about active users, failed tasks, apps, bots, bot schedules, workflows, queues, and the overall status of devices to create custom dashboards and widgets.

When you create and run a bot, Bot Insight automatically creates a default dashboard. If you have a parent bot and a child bot, Bot Insight creates a separate dashboard for each of the bots.

When you deploy and run a bot on the Bot Runner machine, Bot Insight aggregates all the information related to that bot. The published dashboard for that bot displays the aggregated bot information.

My dashboards displays the following dashboards:

- [Operations dashboard](#)
- [Business dashboard](#)

---

**Note:** You must have either the `AAE_Bot_Insight_Admin` or the `AAE_Bot_Insight_Consumer` role assigned to you to view the published dashboard.

---

## Viewing Bot Insight dashboards

The Bot Insight dashboards provide customizable widgets for you to gain insights in specific scenarios. You can view information about your bots on the Bot Insight dashboards from the Control Room.

When you tag variables for analytics in a task and then run the task, Bot Insight generates the analytics dashboard. By default, the system-generated dashboard has the same name as that of the task. You can customize this dashboard to your requirements.

Business analytics provide information on the transactional analytics for data that is logged by the variable tagged in a task. The information provided can be about total sales in a month, invoice, payment

trends, new customer insights, or quote-to-order ratio. You can select your dashboard from the **Select a Dashboard** drop-down menu to view the analytics.

Bot Insight provides the following dashboards:

- **Configure**

The system-generated dashboards are available in the **Configure** tab in the Bot Insight window.

- **Analyze**

The customized dashboards can be published and are available in the **Analyze** tab in the Bot Insight window.

- **Operation**

The **Operation** dashboard provides information about bots that are created, deployed, or scheduled to run across different Bot Runner machines. You can use the information to enhance productivity and take measures based on real-time information for RPA deployments.

1. Log in to the Control Room with one of the following roles:

- AAE\_Bot Insight Admin
- AAE\_Bot Insight Expert
- AAE\_Bot Insight Consumer

2. Click **Explore Bot Insight** from the **Insights** tab.

The Bot Insight dashboard appears in a new window.

## Viewing Insights

You can view information about business data in Bot Insight.

Click **Insights** from the **Analyze** tab to view information about interesting facts on business data.

The Insight dashboard provides information about business data that is logged through Bot Insight without the need to analyze the dashboards. It provides a snapshot of data that you can use to enhance your bot productivity. This feature highlights important facts that are inferred from within the business process data logged by the bots.

A bot created to process orders displays the following information:

- Total processing cost
- Process time
- Monthly payment
- Total payment

The dashboard provides information about the difference between the calculated metric values for a specific time interval:

- Yesterday
- Last 7 days
- Last 30 days

The Insight dashboard enables you to configure the variance thresholds for indicating metric-level health.

Perform the following steps to configure the variance thresholds:

1. Click **Settings**.

2. In the **Variance Threshold** window, move the slider to the left or the right to adjust the variance threshold.
  - Move the slider to the left for a **Poor** metric health level.  
The poor metric level health is represented in red.
  - Move the slider to the right for a **Good** metric health level.  
The good metric level health is represented in green.
3. Enter the values in the **Fair** field to set the **Fair** metric health level.
4. Select the **Switch poor and good** check box to switch between the **Poor** and **Good** metric health levels.
5. Click **Save**.

## Operations dashboard

The Bot Insight Operations dashboard provides information about bots that are deployed on different Bot Runner machines and bot statistics based on performance. You can use this information to enhance productivity and take measures based on real-time information for RPA deployments.

The Operations dashboard provides visual insight into various operational aspects of bots and displays hyperlinks to the following dashboards:

- Bots Dashboard
- Audit Dashboard
- Device dashboard

These dashboards appear as the Default dashboards and are automatically created by Bot Insight based on the variables that are used in the bot. You can use the **Save As** function to save the Default dashboard as a Custom dashboard. You can also add widgets from the Visualizations menu to your custom dashboards.

*Using widgets*

## Bots Dashboard

You can view information about the bots that are created, deployed, scheduled, and running across various Bot Runner machines.

The dashboard displays the following bot information:

- **Total Bot Runs:** Displays the number of running bots.
- **Total Completed (Success):** Displays the number of bots that have ran successfully.
- **Total In Progress:** Displays the number of in-progress bots.
- **Total Failed:** Displays the number of bots that had failed to deploy or run.
- **Weekly Bot Status:** Displays the weekly status of bots that are scheduled to run.

---

**Tip:** You can hover over the widget to view the number of bots that have run successfully, failed to deploy, and failed to run. It also displays the weekly bots statistics percentage.

---

- **Failure Reasons:** Displays reasoning information on bots that had failed.
- 

**Note:** The **Error Message** field displays a snapshot of the original error message and extensive details on why the bot failed. You can export the error messages and logs to a CSV file, which you can later use to troubleshoot.

---

## Audit Dashboard

This dashboard displays various widgets that provide information about Control Room events. Users with the `View everyone's audit log actions` permission have access to view the audit information captured in the Control Room.

*System roles.*

The dashboard displays the following information:

- **Event Distribution by Activity Type**
- **Event Distribution by User Name**
- **Event Distribution by Source**
- **Event Distribution by Control Room Source**
- **Event Distribution by Workbench Source**

You can perform the following actions in the Operations dashboard:

- Enter the name of the dashboard in the **Search** text box to access a dashboard.
- Click the **Favorite** tab to bookmark your dashboard.
- Double-click the **Favorite** menu to remove bookmarks.

You can view information in the following tabs:

- **Total Views:** Displays the number of users who viewed a particular dashboard.
- **Last Refreshed:** Displays the time and date of when a particular dashboard was last refreshed.

You can click the arrow next to the Operations dashboard tabs to organize the dashboards to your requirements.

You can customize the widgets in the Operations dashboard. You can perform the following functions:

- *Working with Bot Insight dashboards*
- *Comparing dashboards*
- *Sharing a dashboard*
- *Taking a screenshot of a dashboard*
- *Downloading a PDF file from a dashboard*

## Device Dashboard

The Device dashboard displays various widgets that provide information about resource utilization of the machines on which bots are executed.

The dashboard provides key metrics to analyze the status and utilization of devices. It also displays the activity history of the bots that are deployed on the machines.

The dashboard displays the following information:

- **Online Devices:** Displays the number of Bot Runner machines that are active or online at a point in time.
- **Offline Devices:** Displays the number of Bot Runner machines that are inactive or offline at a point in time. Devices can be online even though no bots are deployed on them.
- **Bot Schedules on Devices:** Displays the number of bots that are scheduled to run on all the Bot Runner machines.

- **Device Utilization%:** Provides the overall time used by bots that are executed across all the Bot Runner machines. You can view and analyze the utilization information by date using the following criteria:
  - Bot duration
  - Unit: %
  - Group 1: Start date time of a bot (interval: day)
  - Group 2: device name

There is no limit on the number of devices that can be displayed on the dashboard.

- **Device Activity History:** Provides information about the execution history of bots deployed on each Bot Runner machine. The Device Activity History table provides the following information:
  - Device name
  - Bot name
  - Bot duration (milliseconds)
  - Start date time of a bot
  - End date time of a bot
  - Status

When the Group1 and Group 2 fields have date type variables and you select **Bot Duration** as a metric, the **Percentage (%)** option appears as an additional option for **Bot Duration Unit**. Based on the selected group interval, the percentage is calculated for the bot duration.

**Example:** When you select the parameters in the following fields as:

- Group By or Sub By: Date
- Interval: Year
- Metric: Bot Duration
- Bot Duration Unit: Percentage (%)
- The percentage calculated for bot duration is:
 
$$(10000/1000ms * 60s * 60m * 24h * 365days) * 100 = \%$$

---

**Note:** The percentage calculation of the bot duration is available in all the widgets, except datatable and maps.

---

- **Top Error Messages:** Provides information about the error messages for any bot failure and the frequency of occurrence.

## Business dashboard

The Bot Insight Business dashboard provides information about the Bot Insight data and statistics based on bot performance. You can use this information to enhance your productivity and take measures based on real-time information for RPA deployments.

The Business dashboard provides visual insight into the various business aspects of the bots. From this dashboard, you can access both the Default and Custom dashboards.

Bot Insight automatically creates the Default dashboard based on the variables that are used in the bot. You can use the **Save As** function to save the Default dashboard as a Custom dashboard. You can also add widgets from the **Visualizations** menu to your custom dashboards.

### *Using widgets*

In the Custom dashboard, Bot Insight enables you to export data from a dashboard widget to CSV files.

### *Exporting data from a dashboard widget*

You can perform the following actions in the Business dashboard:

- Enter the name of the dashboard in the **Search** text box to access a dashboard.
- Click the **Favorite** tab to bookmark your dashboard.
- Double-click the **Favorite** menu to remove bookmarks.

The dashboard displays the following bot information:

- **Bot Name:** Displays the name of bots that are associated with the business dashboards.
- **Total Views:** Displays the number of users who viewed a dashboard.
- **Last Refreshed:** Displays the time and date on which a particular dashboard was last refreshed.
- **Modified By:** Displays the name of the user who had last modified the dashboard.

You can click the arrow next to the Business dashboard tabs to organize the dashboards to your requirements.

In the **Dashboard Name** tab, select the dashboard that you want to access to view the dashboard. You can also enter the name of the dashboard in the **Search** text box to access the dashboard directly.

Click **Rank** in the **Distinct Count** row to view the rank of each variable. You can view the string data type values that are logged by a variable for the maximum or minimum number of times. This further enhances your ability to verify that the data is logged correctly in the bot.

#### *Viewing ranks of string datatype values*

The Business dashboard widgets displays the following information:

- The total number of variables
- The comparison between number variables and transaction status
- The comparison between number variable distribution and transaction status
- A bar chart representing the distribution between the number variables and string variables
- A pie chart representing the relationship between variables in numbers and strings

The Profile dashboard displays bot variables and the transaction data. The Task Name table displays the variable name, display name, data type, inclusion details, maximum, minimum, average, sum, distinct count for the date, string, and number variables.

The Transaction Data table displays the variable name, display name, data type, inclusion details, minimum, maximum, average, sum, and distinct count metrics for the following parameters:

- **Machine Name**
- **Transaction Name**
- **Transaction Start Time**
- **Transaction End Time**
- **Total Transaction Duration** (Start Time - End Time)
- **Transaction Status** (In Progress or Completed)
- **User Name** (User who runs the bot)

You can use the **Preview Data** option to view the total number of records maintained for each variable. When you create and run a bot with multiple **Transaction Blocks** with **Analyze**, **Open**, or **Close** commands, all the tagged business variables are displayed in the **Transaction Names** menu.

You can customize the widgets in the Business dashboard. You can perform the following functions:

- *Working with Bot Insight dashboards*
- *Comparing dashboards*
- *Sharing a dashboard*
- *Taking a screenshot of a dashboard*

- [Downloading a PDF file from a dashboard](#)

## AARI dashboard

Use the AARI dashboard in Bot Insight to view various widgets that provide information about requests created from published processes in Automation Anywhere Robotic Interface (AARI).

### Overview

The dashboard provides statistics and shows information about created requests for each process, which can vary from a simple summary to a complex cross-departmental view. You can use this real-time information to make process-related operational decisions. For example, consider a scenario where a manager can get a high-level activity overview of completed and pending tasks in the payroll process, which can then help the manager take necessary actions about the process.

From the AARI dashboard, you can access both the Default and Custom dashboards. Bot Insight automatically creates the Default dashboard from the variables used in the process. You can use save the Default dashboard as a Custom dashboard if required. You can also add widgets from the visualizations menu to your custom dashboards.

Based on RBAC, the following users have access to view the data on the dashboard:

- **AAE\_Robotic\_Interface\_Admin** can view all data inside AARI on the web interface across all teams.
- **AAE\_Robotic\_Interface\_Manager** can view all data inside AARI on the web interface for their own teams.

### What you can view in AARI dashboard

The dashboard helps you to visualize and track the number of requests that are open, completed, canceled, or failed.

The dashboard also provides the following capabilities:

- **Heat map chart:** Visualize data about the percentage of request created for each process for a day. You can specify the dates by function (day) to get specific information using the following criteria:
  - Group1: created date (interval: day)
  - Group 2: process name
  - Metric: request created in percentage (%) for each process
- **Request activity history:** This table provides the execution history of the processes deployed on each Bot Runner machine. It includes information such as the following:
  - Process name
  - Username
  - Request details such as the status, ID, end time and start time, duration
  - Total human and bot duration
  - Total human and bot tasks
- **Stacked bar chart:** Analyze the average duration taken by each process for human and bot tasks. For example, consider that there are two processes named API Test-Form 1 and API Test-Form 2 in the bot

task type. For each process, the chart shows the average time (in seconds) taken for its execution. You can view and analyze this information using the following criteria:

- Group 1: task type (human and bot)
- Group 2: process name
- Metric: duration (average)

## Editing a data profile

You can modify the data profile of both the Default and Custom Business dashboards without modifying the bots.

You can edit the data profile and regenerate the dashboard based on the new data profile. You can edit the display name of a variable, change its data type, and exclude it from the dashboard.

Bot Insight provides smart data profiling for information about countries, states, and zip or postal codes. Bot Insight analyzes the information provided in the variables and automatically identifies the information as:

- Country (country code or country name)
- State (state code or state name)
- Zip code (five-digit zip code)

You can edit the data profile to convert the above parameters from numeric format to string format (country and state) based on your requirements. You can convert the zip code to either string or numeric format, and use the information to create widgets (world and US map widgets) in the Bot Insight dashboard.

1. Open the Bot Insight dashboard.
2. Click **Profile**.  
The **Profile** window appears, displaying all the variables that you have tagged during the bot creation.
3. Click **EDIT**.
4. Specify a new name for a variable in the **Display Name** field.
5. Select an option from the **Datatype** drop-down list to specify a new data type for a variable.  
You can change the datatype of a numeric variable to string, string to country, state, and zip code.

---

**Note:** Changes to the **Data Type** parameter cannot be reverted.

---

6. Clear the **Inclusion** check box to exclude the variable from the dashboard. Select **Inclusion** to include a variable from the dashboard and configure how the initial SMART dashboard is generated.  
You can view the minimum, maximum, average, sum, and last value for the numeric values, but not for the string and timestamp variable types.
7. Click **Save and Generate Dashboard** to save the changes and generate the dashboard with the updated value.

## Bot Insight dashboard filter

The Bot Insight dashboard filter enables you to apply filters across your dashboards to display the filtered data. You can save and publish the custom dashboards with preset filters.

Filters in the Bot Insight dashboard enables you to choose different views of the data. You can apply and save filters in a dashboard to preserve the filtered view. The filtered view displays the same view the next time you view the dashboard.

Dashboard filters enables different combinations of data in a single dashboard. The filter eliminates the need for separate dashboards for different users. A single-filtered dashboard allows you to serve data requirements for a wide range of users.

You can access the dashboard filter from both the Operations and Business dashboards. You can click each item in the filter list to view the parameters. You can search for a specific parameter in the **Search Automation Name** field in the **All** tab. You can select parameters based on whether to include or exclude them in the filter. The selected parameters appear in the **Selected** tab.

When you apply a specific filter, the visual indicator in the dashboard displays the name of the applied active filter. You can delete a dashboard filter by clicking the delete icon. When you publish a custom dashboard with the applied the dashboard-level filters, the published dashboard contains the same filters. You can click **Widgets** in the widget window to apply dashboard widgets.

The Bot Insight dashboard provides the following filters:

- **Attributes:** This filter enables you to include or exclude specific parameters of a given attribute. This can be the bot name, device name, or user name.

For example, you can use the parameters:

- **Model Version** to differentiate the payload and to determine if an upgrade is required in the dashboard. You can also use it as a filter so that the dashboard works correctly even with different job execution pay loads.
- **Job type** to identify the type of task such as TASK(Bot Run), WORKFLOW, WORKORDER, WLM\_TASK
- **Automation Name** to provide a name when running or scheduling the bot
- **Object Name** to identify the name of the entity for which the audit action is recorded. For example, to identify the username when the user is edited or created or the bot name when the bot is edited or created.
- **Numeric:** This filter enables you to select a specific duration for which you can get the numerical statistics of the bot. For example, this can be the **totalLines** that is processed by the bot, or the duration during which the bot was active.
- **Time:** This filter enables you to select a single date, or a range of dates to analyze the variables that are categorized under time and date. This can be the bot start time or end time.

### Related concepts

#### [Operations dashboard](#)

The Bot Insight Operations dashboard provides information about bots that are deployed on different Bot Runner machines and bot statistics based on performance. You can use this information to enhance productivity and take measures based on real-time information for RPA deployments.

## Adding a dashboard filter

To create a dashboard filter, select a field containing the information type you want to filter and define the return of the data. The filtered view is preserved so that the same view is displayed the next time you view the dashboard.

1. Open the dashboard to which you want to add a filter.
2. Select the parameter based on your requirements in the **Attributes** tab, .  
The parameter window appears.
  - a) Enter the name of the variable in the **Search** field.  
The variable appears in the **All** tab. Select the variable that you want to add in the filter. The selected variable appears in the **Selected** tab.
  - b) Choose one of the following options:
    - Click **Include** to include the variable in the dashboard filter.

- Click **Exclude** to exclude the variable in the dashboard filter.

c) Click **Apply**.

The **Attributes** filter is added to the dashboard.

3. Select the parameter in the **Numeric** tab.
4. Perform these steps in the selected parameter window:
  - a) Select the condition that you want to specify in the filter.
  - b) Enter the minimum and the maximum values.
  - c) Click **Apply**.

The **Numeric** filter is added to the dashboard.

5. Select the parameter based on your requirement in the **Time** tab.
6. Perform these steps in the selected parameter window:
  - a) Select a specific date, or a range of dates.
  - b) Click **Apply**.

The **Time** filter is added to the dashboard.

### Related reference

#### [Customizing a dashboard](#)

Log in to Bot Insight with the `AAE_Bot_Insight_Expert` role to customize the information displayed in the system-generated dashboard to make it more relevant for an analytics consumer.

## Working with Bot Insight dashboards

You can save or delete a Bot Insight dashboard when required. You can also delete a user-created dashboard.

When you delete a dashboard, it does not impact the data associated with that dashboard. You can delete dashboards that are available in the **Analyze** and **Configure** tabs of the Bot Insight window. The dashboards available in the **Analyze** tab are the published dashboards. Therefore, if you delete a dashboard from the **Analyze** tab, it will no longer be available for other users.

- Save a dashboard:
  - a) Open the dashboard that you want to save.
  - b) From the **Actions** menu, select **Save as**.  
The **Save Dashboard** window appears.
  - c) In the **Dashboard Name** field, enter the name for the dashboard.
  - d) In the **Dashboard Description** field, enter the description of the dashboard.
  - e) Click **Save**.  
Click **Save As** to save a default dashboard as a customized dashboard.
- Open the dashboard you want to delete.
  - a) Click **Delete** on the toolbar.
  - b) Click **Okay**.

## Comparing dashboards

You can compare dashboards that belong to two separate processes, or the same process with different filters. The dashboards selected for comparison appears as a side-by-side view to enable you to obtain better insights.

- Compare dashboards:
  - a) Open the dashboard that you want to compare.
  - b) Navigate to **Actions > Compare** in the **Bots Dashboard**.  
Your dashboard is now in compare mode. The dashboard you have opened appears in both the **Left View** and **Right View**. You can apply widget filters to your dashboard at any time.
- Apply widgets to your dashboards:
  - a) Click the **Filter** option from your dashboards, represented by the three dots in the corner.  
The **Filter** window now appears and shows the available widgets.

---

**Note:** The **Filter** option next to the **Close** option accesses the same **Filter** window. You can also expand or minimize the **Filter** window.

---

- b) Select the **Left View** or **Right View**.
- c) Select the **Attributes**, **Numeric**, or **Time** widgets that you want to apply.
- d) Optional: Click **Clear All** to reset all your widget selections.
- e) Click **Apply** to confirm.  
You can now compare your dashboard with widgets.

## Customizing a dashboard

Log in to Bot Insight with the `AAE_Bot Insight Expert` role to customize the information displayed in the system-generated dashboard to make it more relevant for an analytics consumer.

To make changes in a Bot Insight dashboard, create a copy of the dashboard, and then update the copy.

After you create customized dashboards for a bot, you can make changes to the tagged variables. You can delete and add variables based on your requirements. By default, the standard dashboard always displays the latest data profile. We recommend you use the system-generated standard dashboard, and then create customized dashboards from it. Data profile updates are highlighted with a red dot in the following scenarios:

- When there are data profile updates.
  - The variables that are newly added display the message `NEW`.
  - The variables that are deleted display the message `DELETED`.
- When the customized dashboard data profile does not match that of the standard dashboard.

### Related tasks

[Editing a data profile](#)

You can modify the data profile of both the Default and Custom Business dashboards without modifying the bots.

## Viewing ranks of string datatype values

You can view the string datatype values that are logged by a variable for the maximum or minimum number of times. This enhances your ability to verify that the data is logged correctly in the bot.

1. Open the dashboard for which you want to edit the data profile.
2. Click the **Profile** tab.
3. Click **Rank** within the **Distinct Count** column.

The **Distinct Count** column displays the number of unique values logged by a variable.

---

**Note:** The **Rank** option is only available for the variables that log values of string datatype. A message appears displaying the top five values that are logged for the maximum number of times in the variable.

---

4. Select **Bottom** from the list to display the top five values that are logged for the least number of times in the variable.
5. Select an option from the list to display five or ten values in the message box.

## Previewing data

You can view all the variable data associated with a task using the **Preview Data** option.

1. Open the dashboard for which you want to preview the data.
2. Click the **Data Profile** tab.
3. Click the **Preview data** option.  
A new window appears displaying all the variable data associated with that task.

## Verifying data populated in a custom dashboard

After you create a custom dashboard that contains new widgets or customized widgets from the system-generated dashboards, you can verify the data that is populated in the dashboard.

1. Open the task for which you want to verify the data in Bot Insight.
2. Click **Run** on the toolbar.
3. Click the **ANALYZE** tab.  
The system-generated dashboard for the task appears.
4. Click the **Analyze** tab in the Bot Insight window and search for the customized dashboard for which you want to verify the data.
5. Select the dashboard from the search results.  
The dashboard appears.
6. Click the **Data Profile** tab and verify the data for the dashboard.

## Publishing a business analytics dashboard

Bot Insight enables you to publish a business analytics dashboard that is generated for a task. You can publish both the Custom and Default Business dashboards.

Before you publish a dashboard, ensure that the particular bot resides in the Public folder in the Control Room.

1. Open the dashboard that you want to publish.

2. Customize the dashboard based on your requirements and verify the content and presentation formats.
3. Click **Publish** on the toolbar.
4. Specify a name for the dashboard, and then click **Okay**.  
The dashboard is now published and available to display the production data generated by the task. The dashboard updates the data each time a task runs in the production environment from the Control Room on a regular basis.  
In the Control Room, ensure that you deploy the bot in the Bot Runner device so that the published dashboards are populated with data.

## Related tasks

### Import bots

You can import bots with their dependencies from one Control Room to another. The source environment can be either an Automation 360 Control Room or a 11.x Control Room instance.

### Save a published dashboard

You can publish a Bot Insight business analytics dashboard that is generated for a task. You can also save a copy of the published dashboard when required.

Ensure you have the **AAE\_Bot Insight Admin** and **AAE\_Bot Insight Expert** roles assigned to you.

1. Open the Bot Insight Window.
2. Click the **Business** tab and search for the dashboard for which you want to save a copy of custom production dashboard.
3. Select the dashboard from the search results.  
The selected dashboard appears
4. Select the **SaveAs** from the **Action** menu to save the default **Production** dashboard as a **Custom Production** dashboard.
5. In the **Save Dashboard** window, specify a name for the dashboard and click **Okay**.  
You can add widgets from the **Visualizations** menu to your custom production dashboard.  
You can add, delete, change visualization, apply filters, and so on to customize the dashboard.

### Delete a published dashboard

You can publish a Bot Insight business analytics dashboard that is generated for a task. You can also delete a published dashboard when it is not longer required.

Ensure you have the **AAE\_Bot Insight Admin** and **AAE\_Bot Insight Expert** roles assigned to you.

You cannot delete a default **Production** dashboard if child (custom production dashboards) are associated with it. You must first delete the custom production dashboard and then delete the default **Production** dashboard. However, you can delete a **Custom Production** dashboard.

1. Open the Bot Insight Window
2. Click the **Business** tab and search for the dashboard you want to delete.
3. Click **Delete** from the **Action** menu.
4. Click **Okay** to confirm the deletion.

## Reviewing data in a published dashboard

You can review the data available in a published dashboard.

1. Open the Bot Insight window.
2. Search for the dashboard for which you want to view the data.
3. Select the dashboard from the search results.

The selected dashboard appears.

4. Review the data available in the dashboard.

The dashboard reflects the data processed by the task in the production environment.

5. Export the entire dashboard in PDF or PNG format for offline consumption and review.

## Sharing a dashboard

You can share the link to view a dashboard through email using the **Share via email** option.

1. Open the dashboard that you want to share.
2. Click **Share via email** on the toolbar.

The email client configured on your system appears. The email client contains a link to access the dashboard.

3. Specify the email address of the recipients and send the email.

## Downloading a PDF file from a dashboard

You can download the data available in the dashboard as a PDF file.

1. Open the Bot Insight window.
2. Search for the specific dashboard.
3. Select the dashboard from the search results.  
The selected dashboard appears.
4. Review the data available in the dashboard.
5. In the **Actions** menu, click **Download PDF**.
6. In the **Download PDF** window, navigate to the location on your local disk drive.
7. Click **Save**.

## Taking a screenshot of a dashboard

You can take a screenshot of the data available in the dashboard.

1. Open the Bot Insight window.
2. Search for the dashboard for which you want to view the data.
3. Select the dashboard from the search results.  
The selected dashboard appears.
4. Review the data available in the dashboard.
5. In the **Actions** menu, click **Screenshot**.
6. In the **Download PDF** window, navigate to your local disk drive location.
7. Click **Save**.

# Using Bot Insight

Use Automation Anywhere Bot Insight to track bot data for analytics.

Automation Anywhere bots are built, run, and monitored in the Control Room. Bot Insight accesses real-time business insights and digital workforce performance data to leverage content-level productivity data from the bots that are deployed. Data is logged for business analytics who has Attended and Unattended Bot Runner license .

Log in to Automation Anywhere Control Room as an `AAE_Bot Insight Expert` or `AAE_Bot Insight Consumer` to interactively analyze bot data and enhance bot widgets.

In the Control Room, select the Bot Insight tab, to do the following tasks:

- **Interactively analyze the bot data** in the dashboards.
- **Refine and enhance widgets** in the Bot Insight dashboards *before they are published* for wider consumption and deployed to production.

## Business analytics

Business analytics provide information about the transactional analytics for the data that is logged by the variable tagged in a task. The information provided can be about the total sales in a month, invoicing and payment trends, insight about new customers, or quote to order ratio.

When you tag variables for analytics in a task, and run the task, Bot Insight generates the analytics dashboard. By default, the generated dashboard has the same name as that of the task. You can customize the system generated dashboards based on your requirement.

### Configuring a task for business analytics

To configure a business analytics automation task, enable analytics (using the **Analyze: Open** and **Analyze: Close** actions) and tag the variables that are of interest for data analysis.

To configure a task for business analytics in an existing bot:

1. Log in to the Control Room.

---

**Note:** Ensure that you have the Bot Creator license assigned to you.

---

2. In the **My Bots** pane, select the folder that contains the task for which you want to enable analytics. The **Actions** palette appears in the left-hand side. See [Actions palette content for bot creation](#).
3. Build a bot.  
For more information about building and editing a bot, see [Get started building bots](#).
4. Insert the **Analyze: Open** action at the beginning of the transaction.
5. Insert the **Analyze: Close** action at the end of the transaction.

The **Analyze: Close** menu lists all the variables in the transaction. Select the variables that are tagged in the transaction to process business analytics.

---

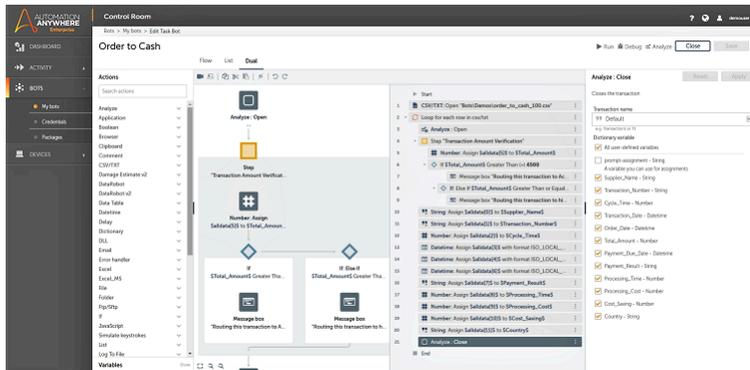
**Note:** This feature enables you to deselect variables that might raise potential privacy concerns, such as social security numbers or bank account details.

---

6. Click **Apply**.  
Click **Reset** to reset the variable selection.
7. Click **Save**.

## 8. Click **Run**.

The **Bot Run Successfully** message appears.



## 9. Click **Analyze**.

The Bot Insight window appears.

## 10. Select a bot from the **Select a Dashboard** drop-down list.

Click the arrow to view the list of bots.

## Using widgets

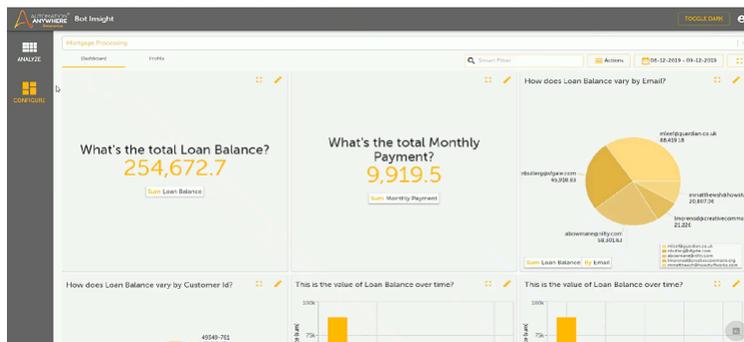
The Bot Insight dashboard provides a host of highly customizable widgets that you can use to gain insights for specific scenarios.

When you select a particular bot, the default widgets automatically appear in the **Dashboard** window. You can select the widgets and reposition them in the dashboard. To search for specific information, use the **Smart Filter** function. You can enter the search parameters in the **Smart Filter** field.

You can also use multiple filters to search for data the widgets should display. Enter the filters, search parameters, separated by a comma in the **Smart Filter** field. You can create, move, rename, and edit the widget properties in a dashboard, based on your requirements.

The available options are:

- Chart filters
- Chart style
- Metric-based filters
- Comparison metrics



You can group information by dates and use the **Date Interval** to view when a particular bot was active.

The following **Date** type options are available:

- **Hour**

- **Day**
- **Week**
- **Month**

## Adding a dashboard widget

You can add custom widgets to the Bot Insight dashboard based on your requirements.

1. Open the dashboard.
2. Click the  icon.  
The **Add Visualization** window appears.
3. Select a widget that you want to add in the dashboard. See [Bot Insight visualizations](#) .  
The **Selected Chart** window appears.
4. **Optional:** Click the **Switch Widget** button to change widgets.
5. Click **Next**.  
The **Construct Your Query** window appears.
6. Enter the query information to construct your dashboard. For reference to create a widget query, see [Configuring a Line Bar Chart query](#).
7. Click **Next**.  
The **Ready to build** window appears.
8. Click **Confirm**.  
The widget appears in the dashboard.

## Bot Insight visualizations

The Bot Insight dashboards provide customizable widgets that you can use to gain insights for specific scenarios.

Bot Insight offers the following visualization widgets:

- **Gauge Chart**
- **KPI**
- **Vertical Bar Chart**
- **Line Bar Chart**
- **Clustered Line Bar Chart**
- **Horizontal Bar Chart**
- **Vertical Stacked Bar Chart**
- **Horizontal Stacked Bar Chart**
- **Vertical Clustered Bar Chart**
- **Horizontal Clustered Bar Chart**
- **Heat Map**
- **Pie Chart**
- **Donut Chart**
- **Line Chart**
- **Scatter Chart**
- **Bubble Chart**
- **Datatable Chart**
- **World Map**

- **US Map**

The **Heat Map** widget enables you to visualize data as a heat map chart. You can specify the dates by function (day, week, month, or year) to drill down to specific information. This map displays all the possible available combinations of variable values in the X and Y axes. Blank heat map blocks appear if there the value attached to the variable is 0. The color of the heat map block depends on the value of the information displayed. A new window with all the relevant information appears when you hover your mouse over a particular heat map block.

The **Datatable Chart** widget enables you to view and analyze information about all the logged data in a tabular chart. You can select the attributes and metrics based on your requirement. All the available attributes and metrics are selected by default.

The **World Map** widget provides information about the data variables and enables you to drill down to specific information:

1. Country
2. State
3. Zip Code
4. Latitude
5. Longitude

The **US Map** widget provides the following information about the data variables and enables you to drill down to specific information:

1. Country
2. State
3. City
4. Zip Code

The **Line Bar Chart** and the **Clustered Line Bar Chart** widgets enable you to view and analyze information about your metrics and attributes. You can input two metrics and one attribute in **Line Bar Chart** widget, while in the **Clustered Line Bar Chart** widget, a **Sub group** option enables you to add one more attributes if necessary.

The widget displays a line bar graph aggregated by group values when only one attribute is selected or a clustered line bar graph aggregated by subgroup values when two attributes are selected. It displays group sectioning which forms multi-axes labels . You can use **Date** types as interval options, grouped by **Day**, **Week**, **Month**, **Quarter**, and **Year**, with the **Day** set as default.

*[Configuring a Line Bar Chart query](#)*

#### **Related tasks**

[Adding a dashboard widget](#)

You can add custom widgets to the Bot Insight dashboard based on your requirements.

## Configuring a Line Bar Chart query

You can construct a custom query based on specific parameters to apply to your widget for line bar and clustered line bar charts.

After you are in the **Construct Your Query** window, follow these steps to select parameters to apply to your widget:

- Construct your query settings.

The query settings vary from widget to widget, but the selection process remains the same.

- Enter the title of your widget in the **Chart Title** field.
- Select a metric option in the **Metric** or **Select Metrics** field.  
For **Line Bar Chart** and **Clustered Line Bar Chart**, the **Metric** field is renamed to **Y1 Axis** and **Y2 Axis**.
- Select an aggregated value in the **Aggregated By** field.  
For **Line Bar Chart** and **Clustered Line Bar Chart**, the **Aggregated By** field is renamed to **Y1 Aggregated By** and **Y2 Aggregated By** with the same options.
- Select a value from the **Group By** or **Group 1** field.
- Select a secondary value from the **Sub Group By** or **Group 2** field.

---

**Note:** The **Sub Group By** or **Group 2** field is not available in the **Line Bar Chart**. For the **Metric**, **Group By** and **Sub Group By** fields, the first value is shown as the default value.

---

- Select a date value in the **Date Interval** field.

---

**Note:** This field appears when you select the Date Type variable in the **Group By** and **Sub Group By** fields.

---

- Construct your advanced query settings.

You can enable more options to any widgets that support advanced settings.

- Click **Advanced Settings**.  
The settings display the default values. You can change the value of the fields if required.
- Select a limit value in the **Limit** or **Group Limit** field.
- Select a sort value in the **Sort By** or **Group Sort By** field.
- Select a sort order value in the **Sort Order** or **Group Sort Order** field.
- Select a secondary limit value in the **Sub Group Limit** or **Group 2 Limit** field.
- Select a secondary sort value in the **Sub Group Sort By** or **Group 2 Sort By** field.
- Select a secondary sort order value in the **Sub Group Sort Order** or **Group 2 Sort Order** field.

---

**Note:** The **Sub Group Limit**, **Sub Group Sort By** and **Sub Group Sort Order** fields are not available in the Line Bar Chart.

---

## Editing a dashboard widget

You can edit the dashboard widget properties based on your requirements.

You can resize and save the widgets in the Bot Insight dashboard based on your requirements. When you resize a dashboard widget, other widgets in the dashboard are automatically adjusted to fill in the available layout.

---

**Note:** Bot Insight allows you to resize widgets in the standard and the customized dashboards. However, it does not allow you to save the widgets after resizing in the standard dashboard.

---

1. Open the dashboard widget.

- Click the **Edit** button.  
The **Edit** window appears.  
The **Edit** menu offers the following options:

<b>Chart Title</b>	Renames the chart
<b>Metric</b>	Changes the units
<b>Aggregate By</b>	Changes the aggregation method
<b>Group By</b>	Changes the parameters based on which the widgets are grouped together

- Click the bottom of a widget to change the attribute of the chart displayed within the widget.
- Click **Save As** to save the widget.

## Drilling down information in dashboard widget

You can drill down information from a dashboard widget based on your requirement. Select the options available in the drop-down list to view specific information in the dashboard widgets.

To use the drill down function feature in the Bot Insight dashboard widget, do the following:

- Open the dashboard and select the widget.
- Right-click to view the **Drill Down** menu.

**Drill Down** menu sample for a mortgage analytics processing bot :

- **Gender**
- **Mortgage Type**
- **Customer ID**
- **Company Name**
- **Email**
- **Loan Due Date**
- **Loan Origin Date**

---

**Note:** Bot Insight dynamically generates the **Drill Down** menu options based on the variables you tag when creating the bot.

---

## Renaming a dashboard widget

You can rename a dashboard widget based on your requirement. The default name of a dashboard widget is based on the type of information that the widget displays.

To rename a widget in the Bot Insight dashboard, do the following:

- Open the dashboard for the widget to edit.
- Rollover and click the **Edit** button.  
The **Edit Chart** window appears.
- In the **Chart Title** field, enter the name of the widget.
- Click **Next**.  
The **Ready to build! Click Finish** window appears.

**5. Click Finish.**

The **Widget Updated** message appears.

## Exporting data from a dashboard widget

You can export data from the Bot Insight **Custom Business** dashboard widgets to CSV files based on the requirement.

1. Open the dashboard.
2. Identify the widget.
3. Click the **Actions** icon.
4. Click **Export**.

The CSV file is automatically saved in your local drive as `Chart name_summary_dd_mm_yyyy`.

## Data connector for Power BI

The data connector for Power BI enables you to establish a secure connection to Power BI, and generate and visualize data analytics. You can connect to the Bot Insight APIs in Power BI and apply specific parameters for each of the APIs.

The connector transforms the Bot Insight API responses to data visualizations in Power BI. The data connector for Power BI enables you to perform the following functions in Power BI:

- Authenticate and connect to the Control Room.
- Connect to APIs.
- Generate API responses.
- Transform the API responses to create a data model.
- Create visuals, charts or graphs, to represent the data.
- Create reports.
- Share reports with other users on Power BI.

You can access the following APIs from Power BI:

- `getaudittrialdata`
- `getbotrundata`
- `gettaskvariableprofile`
- `gettasklogdata`

---

**Note:** Automation Anywhere Power BI connector is certified and available as part of the Microsoft Power BI Desktop August release. The connector is available in the **Other** section of the **Get Data** dialog box in Power BI.

In order to update your Power BI to the latest certified release version and use the connector plug-in, manually deploy the data connector in Power BI. This enables you to retrieve information from the Bot Insight API for data analytics.

---

### Related reference

[Bot Insight API](#)

Users with the `AAE_Bot_Insight_Admin` or `AAE_Admin` role and the `Bot_Insight` license can access the Bot Insight API to retrieve business and operations data.

### Related information

[Microsoft Power BI](#)

## Deploy Power BI connector

Deploy the data connector in Power BI to retrieve information from the Bot Insight API to enable data analytics.

Navigate to `C:\Program Files\Automation Anywhere\Enterprise\Connectors\PowerBI` and access the `AABotInsightV3.mez` data connector file. The `Automation Anywhere\Enterprise\Connectors\PowerBI` path applies to both Microsoft Windows and Linux.

1. Copy the `AABotInsightV3.mez` data connector file to `C:\Users\<<your user>\Documents\PowerBI Desktop\Custom Connectors`.

---

**Note:** The default installation path for systems running MacOS or Linux is `Documents\PowerBI Desktop\Custom Connectors`.

---

2. In the Power BI desktop, navigate to **Options > Security > Data Extensions**, and select **Allow any extension to load without validation or warning**.
3. Restart the Power BI desktop.
4. Access the Power BI data connector.

*[Configure Power BI connector](#)*

## Configure Power BI connector

Configure the data connector in Power BI to retrieve information from the Bot Insight API to enable data analytics.

Ensure that your user name is registered in the Control Room and that you have the `Bot_Insight_Admin`, `AAE_Admin`, or the `Bot_Insight_COE_Admin` role assigned to you.

---

**Note:** The Power BI Connector is supported with Database Authenticated Control Room and Active Directory authentication.

---

1. Log in to the Power BI.
2. Click **Get Data**.  
The list of all the Power BI certified connectors appears.  
For information about how to access non-certified custom connectors, see *[Connector extensibility in Power BI](#)*.
3. Select Automation Anywhere and click **Connect**.
4. In the **Automation Anywhere - Login** window, enter the following information:
  - a) In the **Control Room Version** drop-down menu, select the version of the Control Room.
  - b) In the **Control Room Host** field, enter the IP address or the host name of the Control Room server.
  - c) In the **Bot Insight Host** field, enter the IP address or host name of the Bot Insight server.
5. Click **OK**.

6. In the **Automation Anywhere Login** window, enter your Bot Insight user name and password.  
To provide the credentials for Active Directory authentication, you must enter the domain name delimited by a double backslash (\\) along with the user name in the **User name** field. For example:  
domain name\\user name.
7. Click **Connect**.  
The Bot Insight APIs are authenticated and the authorization tokens are generated. The Bot Insight APIs are loaded dynamically from Swagger, along with the applicable request parameters.
8. Select the required Bot Insight API from the **Navigator** menu and enter the information in the respective fields.
9. Click **Load**.  
The API retrieves specific information from the server.  
To learn how to retrieve information from Bot Insight APIs in Power BI, see [Bot Insight API](#).
10. Click **Transform Data** to convert the structured JSON response to a visual data model.

### Related information

[Transform, shape, and model data in Power BI](#)

[Create reports and dashboards in Power BI](#)

[Collaborate, share, and integrate across products with Power BI](#)

## Example: Retrieve information in Power BI using business information API

The Power BI connector enables you to access the Bot Insight API from Power BI. This example task shows you how to retrieve information from the Bot Insight API and build data visualizations in Power BI.

1. Open Power BI.
2. Open the **Navigator** window, and log in to the Control Room by entering the credentials.
3. In the **Display Options** menu, select **fx Business Information**.  
The **API** window appears.
4. In the **botName** field, enter the name of the bot, or the task for which you want to visualize the analytical data.  
To enter multiple bot names, separate each name with a comma.  
For example, `SalesAPAC,SalesEMEA,SalesUS`.
5. In the **pageNo** field, enter the offset value for the rows or records that you want to retrieve.
  - If page = 0, and limit =1000, then rows 0 -1000 will be retrieved.
  - If page = 1, and limit =1000, then rows 1001 -2000 will be retrieved.
6. Optional: In the **fromDate** field, enter the date from when you want to retrieve the information.  
Format: `yyyy-mm-dd`, or `yyyy-mm-ddTh:m:s.msZ` (2020-02-20T12:45:23.000z)

---

- Note:** If you do not enter a date, the API will return all available data.

---

7. Optional: In the **toDate** field, enter the date till when you want to retrieve the information.  
Format: `yyyy-mm-dd`, or `yyyy-mm-ddTh:m:s.msZ` (2020-03-21T15:45:32.000z)

---

- Note:** If you do not enter a date, the API defaults to the current date.

---

8. In the **limit** field, enter the number of rows or records you want to retrieve.

9. Click **Apply**.  
Power BI displays the data visualization.

## Configure Tableau web data connector in Bot Insight

The web data connector in Tableau enables you to establish a secure connection with Automation 360 and to extract, visualize, and analyze data from Bot Insight.

- Ensure that your user name is registered in the Control Room and that you have **Bot Insight Admin** or the **AAE\_Admin** role assigned to you.
- Ensure you have access to the desktop or public version of Tableau software.

The Web data connector in Tableau enables you to perform the following functions in Tableau:

- Authenticate and connect to the Control Room.
- Connect to Bot Insight APIs for business and operational information.
- Use business and operational information to create a data model.
- Create charts or graphs to represent the data.
- Create reports and share them with other users on Tableau.

1. Open Tableau.
2. Select **Web Data connector** from the **Connect** option in **Data** tab.
3. In the **Web Data Connector** window, enter your Automation Anywhere URL in web data connector field: `<control room url>/tableau/Login.html`
4. In the **Automation Anywhere - Login** window, enter the following information:
  - a) In the **Control Room Version** drop-down menu, select the version of the Control Room.
  - b) In the **Control Room URL** field, enter the URL or the host name of the Control Room.
  - c) In **User Name** and **Password** field, enter your Bot Insight user name and password.
5. Click **Submit** to connect to Bot Insight APIs.
6. Select either **Business Information** or **Operational Information** in the Bot Insight window.  
If you are an **AAE\_Admin**, you can choose between Audit APIs and Operations APIs.
7. Click **Get Data**.  
Bot Insight API retrieves information from the server.
8. Click **Update Now** to gather all the data from Bot Insight in Tableau.  
You can use the retrieved data from Bot Insight for data visualizations and analysis in Tableau.

# Index

## Numerics

10x migration apis [1441](#)  
11x migration apis [1441](#)

## A

a-people access [1374](#), [1375](#)  
A2019 [1530](#)  
action [1013](#)  
action mapping  
  migration [1447](#)  
action package [1305](#)  
action package sdk [1175](#)  
active [1260](#)  
Active Directory  
  create  
    user [1325](#)  
activity  
  historical [1265](#)  
  in-progress [1265](#)  
Activity table [1261](#), [1266](#)  
activity type [1260](#)  
add ip [1356](#)  
add-bots [1294](#)  
add-device-pools [1295](#)  
add-queue-owners [1289](#)  
add-queues [1295](#)  
Administration  
  overview [1322](#)  
administrator mode [458](#), [473](#)  
advanced  
  bots [1175](#)  
analytics [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)  
introduction to Bot Insight [1546](#)  
analytics connector [1553](#)  
analyze [1308](#)  
Analyze [1530](#)  
annotation  
  creation [1216](#), [1216](#)  
  function [1216](#), [1216](#)  
  validation [1216](#), [1219](#)  
annotations [1216](#), [1216](#), [1219](#)  
anti-virus settings [454](#)  
api [1434](#)  
  *See also* device pool  
api filter [1526](#), [1527](#), [1528](#)  
api filters [1524](#)  
asynchronous [456](#)  
asynchronous replication [401](#)  
attended bot runner  
  license [480](#)  
attributes [1540](#), [1541](#)  
Audit API [1386](#)  
audit log controls [1267](#)  
audit logs [1267](#)  
auto mode [469](#)  
auto-update bot agent [502](#)

automation  
  priority [1281](#)  
Automation Anywhere Enterprise  
  operating system compatibility [353](#), [369](#)  
Azure  
  cluster configuration [435](#)  
  customize cluster [431](#)  
Azure cluster environment [429](#)

## B

background process [899](#), [994](#)  
backup  
  databases [365](#)  
  DR [401](#)  
bot creator  
  license [480](#)  
Bot Creator  
  ports required [376](#)  
bot creator credentials [1308](#)  
bot insight  
  license [480](#)  
Bot Insight  
  using [1546](#)  
bot insight migration [557](#)  
Bot Insight overview [1530](#)  
bot migration wizard [573](#)  
bot runner  
  license [480](#)  
Bot Runner  
  ports required [376](#)  
Bot Runners  
  disaster recovery [403](#)  
bots  
  advanced [1175](#)  
  first [509](#)  
  hello world [509](#)  
browsers [382](#)  
business data [328](#)

## C

c [735](#)  
cache storage [456](#)  
caching [456](#)  
capture image [839](#), [840](#), [841](#), [841](#), [843](#)  
Certificate [411](#)  
certificates  
  required [454](#)  
change [1328](#)  
changed features [204](#), [214](#), [221](#), [228](#), [233](#), [240](#), [241](#)  
chat-bot [1303](#)  
check in [1309](#)  
check out [1309](#)  
client  
  prerequisites [364](#)  
client service  
  disaster recovery [403](#)

- Close [661](#)
- cloud
  - install [350](#)
- cloud enabled [328](#), [463](#)
- cloud security [328](#)
- cloud-enabled [463](#)
- cluster
  - Control Room on Azure [431](#)
  - processes [397](#)
- Cluster [416](#)
- cluster setup [404](#)
- concurrent operations [362](#)
- configuration
  - AD mode [469](#)
  - control room [465](#)
  - DR [401](#)
- configure
  - Azure cluster [435](#)
- configure build files [1182](#)
- connect 10x database [1449](#)
- connected [1273](#)
- Connection
  - Credential Vault [1357](#)
- Control Room
  - Azure cluster configuration [435](#)
  - Azure install [430](#)
  - customize cluster [431](#)
  - data center components [296](#)
  - database [365](#)
  - disaster recovery [403](#)
  - HA and DR [394](#)
  - ports required [376](#)
  - prerequisites [364](#)
- control room api [1434](#)
- control room configuration
  - workflow [465](#)
- control room login [487](#)
- control room service [456](#)
- copy bot [1018](#)
- credential name [1312](#)
- Create
  - role [1329](#)
- create folder [1309](#)
- create repository [1309](#)
- create role [1308](#)
- create user [1308](#), [1310](#)
- Create user
  - Active Directory [1325](#)
- create worksheet [740](#)
- create-queue [1289](#)
- createdOn [1386](#)
- creation annotation [1216](#), [1216](#)
- credential [1317](#)
- Credential
  - edit [1318](#)
- credential allow password [1220](#)
- credential locker [1319](#)
- credential vault [1312](#)
- Credential Vault
  - connection [1357](#)
  - email notification [1321](#)

- credentials
  - required [454](#)
  - requirements [371](#)
- Credentials
  - overview [1316](#)
- csv [1273](#)
- current bot [1260](#)
- current command [1260](#)
- custom install [404](#)
- custom installation [467](#), [469](#), [471](#)
- custom launch cycle [467](#), [469](#), [471](#)
- custom mode [419](#), [467](#), [469](#), [471](#)
- custom variables [1190](#)

## D

- dashboards [1531](#), [1533](#), [1535](#), [1537](#), [1540](#), [1541](#), [1548](#), [1549](#)
- data center
  - Control Room [296](#)
- data privacy [328](#)
- data security [328](#)
- database
  - control room [365](#)
  - disaster recovery [403](#)
  - server requirements [365](#)
  - SQL [365](#)
- database management system [359](#)
- database replication [399](#)
- databases
  - backup [365](#)
  - recovery [365](#)
- delete
  - scheduled [1265](#)
- delete task [1013](#)
- delete-work-item [1303](#)
- dependencies
  - uploading [1046](#)
- deploy
  - HA [395](#), [399](#)
  - load balancer [374](#)
  - model options [393](#)
  - single-node [394](#)
- deployment
  - concurrent operations [362](#)
  - time to start [362](#)
- deprecated [204](#), [214](#), [221](#), [228](#), [233](#), [240](#), [241](#)
- developer [1175](#)
- developer sdk [1175](#)
- device licenses [1366](#)
- device pool
  - create [1279](#), [1284](#)
  - details [1280](#)
  - edit [1281](#)
  - update [1281](#)
  - view [1280](#)
- device pool api [1434](#)
- device pool consumer [1434](#)
- device pool owner [1434](#)
- devices [1273](#)
- dictionary type variables [1191](#)

- disaster recovery
  - failover steps [403](#)
  - HA [399](#)
  - sites [401](#)
- disaster recovery (DR) [394](#)
- disconnected [1273](#)
- disk space [359](#)
- do not repeat [1015](#)
- domain user account [368](#)
- DR
  - pre-configuration requirements [401](#)
  - prepare [401](#)

**E**

- Edit
  - credential [1318](#)
  - locker [1320](#)
- edit task [1013](#)
- edit-work-item [1303](#)
- elasticsearch [456](#)
- Email
  - notifications
    - Credential Vault [1321](#)
- entry list rest web services [1192](#)
- equal to [665](#)
- example [1062](#), [1308](#), [1308](#), [1309](#), [1310](#), [1312](#)
- example repository [1309](#)
- examples filter [1527](#), [1528](#)
- excel action [751](#)
- express launch cycle [466](#)
- express mode [419](#), [466](#)
- extract text from image [839](#), [840](#), [841](#), [841](#), [843](#)

**F**

- failover mode [399](#)
- failover steps [403](#)
- feature (comparison) (matrix)) [301](#)
- file name [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)
- filter apis [1524](#)
- filter botstatus [1527](#)
- filter example [1526](#), [1527](#), [1528](#)
- filter firstname [1526](#)
- filter name [1527](#)
- filter repository management [1527](#)
- filter substring [1527](#), [1528](#)
- filter updatedOn [1528](#)
- filter username [1526](#), [1528](#)
- filters [1524](#), [1540](#), [1541](#)
- find [751](#)
- first bot [509](#)
- first time configuration
  - control room [465](#)
- fixed features [204](#), [214](#), [221](#), [228](#), [233](#), [240](#), [241](#)
- function annotation [1216](#), [1216](#)

**G**

- getting started [466](#), [467](#), [469](#), [471](#)
- Getting started
  - Control Room [352](#)

- Git repository [1360](#)

**H**

- HA
  - processes [397](#)
- HA high availability [395](#), [399](#)
- handle session [1209](#)
- High Availability [416](#)
- high availability (HA) [394](#)
- historical
  - Activity [1266](#)
- historical activity [1266](#)
- how to filter [1524](#)
- HTTPS [374](#)
- https [458](#), [473](#)

**I**

- import certificate [458](#), [473](#)
- install
  - cloud [350](#)
  - on Azure cluster [429](#)
- install token [463](#)
- installation
  - configuration requirements [454](#)
  - prerequisites [364](#)
- installation path [458](#), [473](#)
- ip addresses
  - required [454](#)
- ipall [368](#)

**J**

- journalid [1447](#)

**K**

- known limitations [204](#), [214](#), [221](#), [228](#), [233](#), [240](#), [241](#)

**L**

- language settings [454](#)
- License
  - overview [480](#)
  - trial [476](#)
- license server [480](#), [1366](#)
- licenses
  - permissions [483](#)
- list migration results [1444](#)
- load balancer [374](#)
- locker [1312](#), [1319](#)
- Locker
  - edit [1320](#)
- log on [487](#)
- logging [1267](#)
- login [487](#)
- login steps [487](#)
- logs [1267](#)

**M**

- maintenance
  - databases [365](#)
- manage bot ideas [1375](#)
- manage-work-item [1303](#)
- manual mode [467](#), [471](#)
- master key [466](#), [467](#), [469](#), [471](#)
- MatchesRegex [1193](#)
- messaging [456](#)
- Microsoft SQL server [395](#)
- Microsoft SQL Server [359](#)
- Microsoft Windows Server [359](#)
- migrate to A2019 [522](#)
- migrate to enterprise A2019 [522](#)
- migrated credentials [1456](#)
- migrated users [1454](#)
- migration [522](#), [1447](#)
- migration API [1447](#)
- migration api filters [1524](#)
- migration apis [1441](#)
- migration journal id [1447](#)
- migration to A2019 [522](#)
- migration to enterprise A2019 [522](#)
- migration, migrate [667](#)
- monitor migration [1447](#)
- my devices [1273](#)

**N**

- .NET Framework [359](#)
- netmask [1356](#)
- network access [1355](#)
- new features [204](#), [214](#), [221](#), [228](#), [233](#), [240](#), [241](#)
- non-active directory [487](#)
- notification [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)
- NTP settings [454](#)
- numeric [1540](#), [1541](#)

**O**

- ocr [839](#), [840](#), [841](#), [841](#), [843](#)
- offline [1273](#)
- Open [661](#)
- operating systems
  - compatibility [353](#), [369](#)
- operational data [328](#)
- operations
  - repository [362](#)
- organize actions [1189](#)
- Overview
  - Administration [1322](#)
  - credentials [1316](#)
  - users [1322](#)

**P**

- package
  - manage [1305](#)
- package management [1306](#), [1311](#), [1369](#)
- package sdk [1175](#)
- password [466](#), [467](#), [469](#), [471](#), [1328](#)

- password limitation [404](#)
- pause task [1016](#)
- paused [1260](#)
- paused for input [1260](#)
- permissions
  - required [454](#)
- personal data [328](#)
- pool id [1434](#)
- ports required [376](#)
- postgreSQL [404](#)
- postgreSQL server [395](#)
- Power BI [1553](#)
- prerequisites [364](#)
- primary site
  - disaster recovery [399](#), [403](#)
  - HA [395](#)
- privacy [328](#)
- product licenses [483](#), [1366](#)
- properties [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)

**Q**

- queue [1260](#)
- queue-consumers [1290](#)
- queue-participants [1290](#)

**R**

- RAM [359](#)
- record task [1013](#)
- recovery
  - databases [365](#), [365](#)
- recovery site [399](#), [403](#)
- region settings [454](#)
- release notes [9](#), [204](#), [214](#), [221](#), [228](#), [233](#), [240](#), [241](#)
- remote git [1360](#)
- rename task [1013](#)
- repeat [698](#), [826](#), [874](#), [876](#), [878](#), [880](#), [1015](#)
- repeat a task [1015](#)
- repository
  - concurrent operations [362](#)
- repository management api filters [1524](#)
- repository requirements [381](#)
- requirements
  - credentials [371](#)
- reset [1328](#)
- retrieve migrated bots [1458](#)
- return values [1187](#)
- reverse proxy [456](#)
- Role
  - create [1329](#)
  - new [1329](#)
- roles [1309](#), [1310](#)
- run [1015](#)
- run a bot [1015](#), [1262](#)
- run bot [1273](#)
- run bot now [1015](#)
- run task [1013](#), [1016](#)
- run-as-user [1295](#)
- running a task [1016](#)

**S**

saml [476](#), [1356](#)  
saml access [1374](#), [1375](#)  
SAP [906](#)  
SAP automation [906](#)  
SAP integration [906](#)  
schedule  
    activity [1265](#)  
    change [1263](#)  
schedule a bot [1262](#)  
scheduled activity  
    delete [1265](#)  
    edit [1263](#)  
Scheduled activity [1261](#)  
SDK [1175](#)  
secondary site  
    disaster recovery [399](#), [403](#)  
    HA [395](#)  
security [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)  
security question [466](#), [467](#), [469](#), [471](#)  
self-signed [411](#), [457](#), [473](#)  
self-signed certificate [457](#), [473](#)  
send to task [1013](#)  
server  
    hardware prerequisites [364](#)  
server message block (SMB) file share [395](#)  
servers  
    databases [365](#)  
setup [359](#)  
shared session [1212](#)  
single-sign on [404](#)  
single sign-on [467](#), [469](#), [471](#)  
single-node deployment [394](#)  
SMB file share [395](#)  
software development kit [1175](#)  
speed [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)  
sql [368](#)  
SQL  
    database [365](#)  
sql server [368](#)  
SQL server [395](#)  
sql server configuration manager [368](#)  
stop task [1016](#)  
storage  
    databases [401](#)  
subnet [1356](#)  
subversion [359](#)  
subversion (SVN) server [395](#)  
SVN repository [359](#)  
SVN server [395](#)  
switch control room [504](#)  
synchronization  
    time [454](#)  
system variables [1027](#)

**T**

Table  
    Activity [1261](#)  
task [1016](#)  
task list [1013](#)

TCP [374](#)  
technical architecture [298](#), [298](#)  
test [1016](#)  
time [1540](#), [1541](#)  
time-based event-based triggers [1202](#)  
TLS [411](#)  
token [1364](#)  
Trial  
    license [476](#)  
tuning  
    parallel repository operations [362](#)

**U**

unattended bot runner  
    license [480](#)  
update a2019 [511](#)  
update a2019 on-prem [511](#)  
update enterprise a2019 [511](#)  
update to latest a2019 [511](#)  
update to latest enterprise a2019 [511](#)  
upgrade to A2019 [522](#)  
upgrade to enterprise A2019 [522](#)  
upload custom package [1185](#)  
upload packages [1306](#), [1311](#), [1369](#)  
upload task [1013](#)  
user management api filter [1526](#)  
user management api filters [1524](#)  
user management filter [1526](#)  
userName [1386](#)  
users [1310](#)  
Users  
    overview [1322](#)  
using excel action [751](#)  
using ocr action [839](#), [840](#), [841](#), [841](#), [843](#)  
using variables [1026](#)

**V**

validation annotation [1216](#)  
validation annotations [1219](#)  
variables [1026](#)  
version  
    release notes [9](#)  
versions  
    browsers supported [382](#)  
view licenses [1366](#)  
view log [698](#), [826](#), [874](#), [876](#), [878](#), [880](#)  
view-work-item [1303](#)  
view-work-item-result [1303](#)  
view-work-items [1303](#)

**W**

white list [356](#)  
whitelist [1355](#), [1356](#)  
whitelisting [356](#)  
windows services [456](#)  
windows authentication [368](#)  
Windows services  
    required [454](#)  
wizard [466](#), [467](#), [469](#), [471](#)

wlm [1286](#)  
work-item-structure [1291](#)  
workload management [1286](#)  
workload-maintenance [1295](#)  
workload-queues [1287](#)