Freestyle Orchestrator Admin Guide

VMware Workspace ONE UEM

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Contents

1 What is Freestyle Orchestrator? 5

Intended Audience 5

Prerequisites for Freestyle Orchestrator 5

Components of a Workflow 6

Resource 6

Condition 7

Group 12

2 Getting Started with Freestyle Orchestrator 13

Stage Workflow Resources 13

Create your Workflow 14

Build Workflows using Freestyle Orchestrator List Builder or Flow Builder 15

Monitor Workflow Performance 16

Configure Default Settings for all Workflows 16

3 Lifecycle of a Workflow 17

Save a Workflow without Publishing the Workflow 17

Publish a Workflow on an End User Device 17

Update a Workflow 18

Workflow Actions 18

Pause a Workflow 19

Delete a Workflow 19

Freestyle Orchestrator Dashboard Details 19

Configure On-Demand Workflow Deployment Options 20

4 Sequence the Installation of Resources 22

Create a Workflow to Sequence the Installation of Applications 22

Create a Workflow to Sequence the Installation of Profiles 24

Create a Workflow to Sequence the Installation of Scripts 26

Create a Workflow to Install a Group of Resources 27

5 Define Actions on Resources Using Conditions 30

Create Workflow with the Application Name and Application Version Condition 31

Create Workflow with the File Exists Condition 32

Create Workflow with the Registry Exists Condition 34

Create Workflow with the Sensor Value Condition 35

Create Workflow with the Time Window Condition 36

Create Workflow with the Attributes Condition 38

6 Creating Workflows for Complex Profiles 40
Create a Workflow to Configure BIOS Profile on Windows Desktop Devices 40
Prerequisites 41
Procedure 41
Create a Workflow to Configure OEM Updates Profile for Windows Desktop Devices 41
Prerequisites 41
Procedure 42
Create a Workflow to Configure a Kiosk Profile for Windows Desktop Devices 42
Prerequisites 42
Procedure 42

7 Monitoring the Deployment of your Freestyle Workflow and Workflow Process 44
Workflow Process 45
Workflow Process upon Device Check-in 46
Running Workflows without an Active User 46
Workflow Status Updates 46
Coexistence of Direct Assignments and Workflow Assignments for Resources 47
Applications in Workspace ONE Intelligent Hub App Catalog 47
Deleting a Workflow 47
Deleting a Resource Assigned through Direct Assignment 47
Device Details and App Details Page 47

8 Working with Freestyle Orchestrator on Multiple Organization Groups 48
Freestyle Orchestrator List View 48
Access to Resources within Workflows 49
View Workflow Details 49

9 Role-Based Access for Freestyle Orchestrator Workflows 50

What is Freestyle Orchestrator?

1

Freestyle Orchestrator is a low-code IT orchestration platform that gives an administrator the flexibility to create workflows to fit specific deployment requirements for their organization. Use workflows to distribute resources to devices in a sequence of steps, based on granular criteria. The resources can be applications, profiles, and scripts.

An administrator can use workflows to perform the following tasks:

- Sequentially order the installation of each resource, such as applications, profiles, or scripts to meet specific installation requirements.
- Deploy a resource based on select conditional criteria using sensors, application inventory data, and more.
- Push a script to a device similar to resources like applications and profiles.
- Perform state evaluation rules and apply logic to individual steps within a workflow or across the totality of a workflow.

This chapter includes the following topics:

- Intended Audience
- Prerequisites for Freestyle Orchestrator
- Components of a Workflow

Intended Audience

This guide is intended for administrators who want to create customized workflows designed to fulfill a specific goal. You can create workflows to sequentially install resources such as applications, scripts, and profiles, based on the conditions you define.

Prerequisites for Freestyle Orchestrator

To successfully create workflows in Freestyle Orchestrator and run the workflows on a device, you must meet the following Workspace ONE UEM console, platform, and device-side client requirements.

- UEM console requirements: To use Freestyle Orchestrator, you need Workspace ONE UEM console version 2010 and later.

- Platform requirements: Freestyle Orchestrator feature supports Windows 10 and macOS platforms only.
- Device-side client requirements: The Freestyle Orchestrator feature requires the following minimum version of VMware Workspace ONE Intelligent Hub installed on the target device:
  - Windows 10: VMware Workspace ONE Intelligent Hub 20.10
  - macOS: VMware Workspace ONE Intelligent Hub 20.10 and VMware Workspace ONE Workflow Engine 20.10 (only required for macOS)

Components of a Workflow

The resources, conditions, and groups are the key components of a workflow. The workflow components are described in the following sections:

- Resource: Use resources to build a workflow. Resources consists of an application, profile, or script.
- Condition: Use condition to create conditional requirements, based on data points from different sources, such as sensors, application inventory, file inventory, and so on.
- Group: Use group to deploy sets of resources that do not have any relative priority to each other but are deployed as one collective workflow step.

Resource

Resources in a workflow include applications, profiles, and scripts. You must add all the required resources to your system inventory before you can add these resources to your workflow. You can add resources to a workflow as required and define actions on each resource. You can define actions such as install applications, profiles, and run script on devices that are assigned to a workflow. Resources are installed on devices in the order defined in the workflow.

In a workflow, you can only select the resources that are available in the system inventory and you cannot add resources to the system inventory from the workflow. You can add resources into a workflow that are part of your current organization (OG) and or inherited from a parent OG. However, you cannot add resources that are managed at a child OG. To add the resources managed at your child OG, you must create a workflow at the child OG level.

After adding a resource to a workflow, you can use the **Re-install if removed** option as an additional setting. This setting is found in the workflow **Admin Panel**, under the **Additional Settings** section. If a user deletes a mandatory resource from a device, the **Re-install if removed** option ensures that the resource gets installed again on the device.

Note: The **Re-install if removed** option is supported on Windows 10 and macOS devices.

Resource Error Handling

For each resource, you can configure the resource behavior based on an error condition and define the necessary action to be taken during an error condition. In the workflow **Admin Panel**, under the **Additional Settings**, the **Error Handling** option is enabled by default. You can edit the **Error Handling** option to modify the default settings.

Note: For Windows devices, the **Error Handling** option is available for apps and profiles and for macOS devices the option is available only for applications.

The following table lists the error handling options and their default values.

Table 1-1. Resource Error Handling Options and Default Values

Options	Default Value	Description
Timeout	1440 minutes	Specify the maximum time to wait for a workflow step to complete.
Retry After	720 minutes	Specify the time interval after which the workflow steps with errors are retried.
Maximum Retries	4	Specify the maximum number of retries to reinstall a resource.
Backoff Rate	2	Specify a multiplier that determines the interval between subsequent retries.
Retry Interval	First retry after 1440 minutes, second retry after 2880 minutes, third retry after 4320 minutes, and fourth retry after 5760 minutes	Specify the retry interval for the first and second retry in hours.
When Retries Are Exhausted	Archive workflows	You can perform the following actions when the retries are exhausted: Stop workflow or Skip Workflow Step.

Note: If you want to restore the default settings for the error handling option, click the **Restore To Default** option.

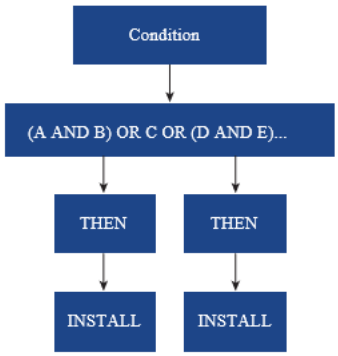
Condition

An admin can deploy a resource to a device based on certain conditions defined in the workflow. A condition can be defined for resources such as application, file, registry, sensor, and extended device inventory attributes data. You can define the criteria based on a condition and can select a condition at any step in a workflow after the initial platform and smart group selection.

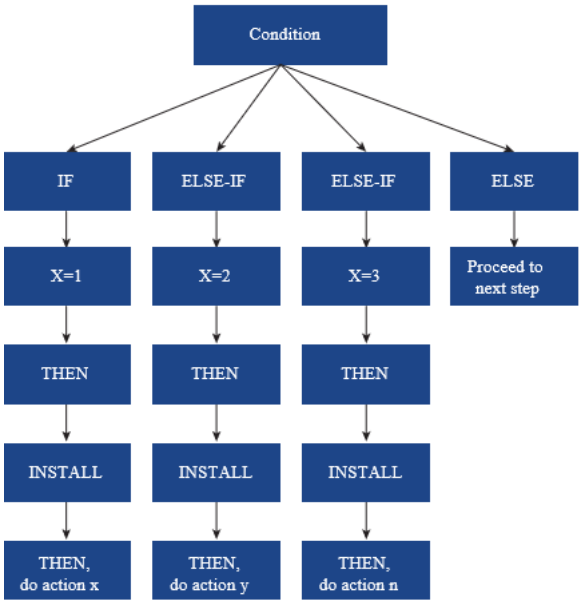
Each condition has a set of properties with a conditional operator and value that helps identify if a certain condition is met. Based on the result of a condition, whether a condition is met or not, the workflow transitions to the next step as defined in the workflow.

The following types of conditions are supported:

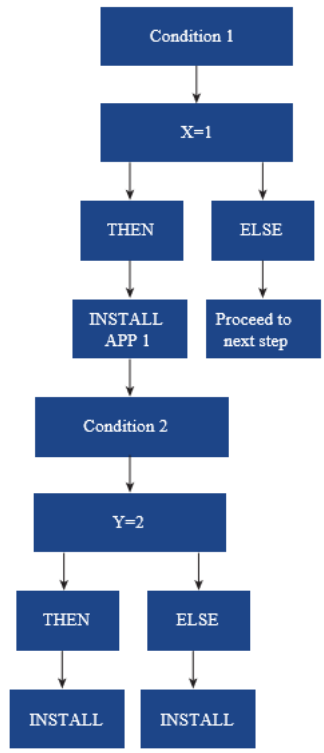
- Complex condition: In a complex condition, you can define complex rules using the **And** or **Or** options within an **If** condition and evaluate multiple properties. Use the **Then** option to add more resources to a condition and the **Else** option is the last step in a condition. The following illustration describes an example of a complex condition.



- Branches in condition: You can create different branches of conditions, check the value of each condition, and define further steps based on the value returned. You can have any number of branches within a condition and different results for the same condition are supported. The following illustration describes an example of branches in condition.



- Nested condition: You can create a condition under a condition. For example, you can define a condition and if the value is "x" then define a specific action and if the value is "y" then define another action. Based on the value returned, you can define the action for a condition. The following illustration describes an example of a nested condition.



Note: A condition cannot be the last step in a workflow without any action associated with it.

After adding a condition to a workflow, you can configure the condition to be re-evaluated. In the workflow **Admin Panel**, under the **Additional Settings**, the **Re-evaluate condition** option is deactivated by default. When the **Re-evaluate condition** option is enabled, the entire workflow is re-run every 15 minutes.

Note: When you enable the **Re-evaluate Condition** option for a script within a condition, the script re-runs on each evaluation. You must ensure that the script can run multiple times without any issue. You can implement a flag file or indicator to check if the script is running and to determine if the rest of the script operation must proceed.

Condition with Applications

For applications, the application exists or does not exist condition is supported. When the application exists or does not exist option is selected, the administrator can filter an application by specifying the application name and version. Based on the application inventory across devices, a preview of all the applications matching the condition is displayed.

In a condition, if operators such as greater than or less than are selected, and if the actual version on the device does not match the version input provided, then such devices are assumed to have not met the condition.

Note: An application condition can only be added for Windows devices.

An administrator can create a condition to check if an application name and a specific application version is installed on a device. When the condition is run on a device, the device first checks if the application is installed on the device and populates the results. In the results populated, the device checks if the specific application version is installed. There is no accurate versioning syntax for the applications. So, applying criteria like greater than or less than for alphanumeric application versions might not provide accurate results. However, when the actual workflow runs on the devices the system performs a more accurate search and populates the results.

Condition with Sensors

A sensor is a type of script deployed with the intent of collecting a single value of data from the device. You can use a sensor in an **If**, **And**, **Or**, **Else**, and **Then** conditions by searching for the sensor name in the **Search** field. The response data type configured for the chosen sensor determines the operator types that are available for the condition. The following table shows a list of operators available for each response data type.

Table 1-2. Sensor Data Type and Supported Condition Operators

Sensor Data Type	Condition Operators Supported
Boolean	Equals
Date Time	After, Before, Between, Not Between, Within, Not Within
Integer	Equals, Not Equal To, Less Than, Less Than or Equal To, Greater Than, Greater Than or Equal To, Between, Not Between
String	Includes, Does Not Include, Equals, Starts With, Contains, Does Not Contain

For more information about creating Sensors, see the *Collect Data with Sensors for macOS Devices* topic in the *macOS Device Management* guide and the *Collect Data with Sensors for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.

Condition with Files

For files, the file exists or does not exist condition is supported. In the file exists or does not exist condition you can filter the search results based on the **File Path**, **Version Number**, and file **Modified** parameters. The **file path** selection is mandatory in the file condition.

When the **Modified on** value for the file condition is used, you must ensure that the modified date is compared with the right format on the device side. If the administrator enters the date in the MM/DD/YYYY format and the device maintains the dates in the DD/MM/YYYY format, then the MM/DD/YYYY format must be converted to the DD/MM/YYYY format for comparison.

Note: A file condition can only be added for Windows devices.

Condition with Registry

For registry, the registry exists or does not exist condition is supported. The registry condition is only supported on the Windows devices. In the registry exists or does not exist condition you can filter the search results based on the **Registry Path**, **Value Name**, **Value Type**, and **Value Data** parameters.

Note: A registry condition can only be added for Windows devices.

Condition with Time Window

A time window is a schedule defined for your device during which updates and resource delivery can be scheduled as per your business needs. A time window can either be Maintenance hours or Business hours type and can either use the device local time or the UTC time zones.

An administrator can define one-time, daily, weekly recurring time windows during which apps, profiles, and scripts are downloaded and installed. For time windows, In or Not In Business hours and In or Not In Maintenance hours conditions are supported.

A time window condition differs from the other workflow conditions in following aspects:

- A time window cannot be a part of a condition with And, Or operators.
- If a time window condition is present in the If branch, an Else branch cannot be added to the condition.
- Desired State Management (DSM) settings cannot be enabled on a time window condition. The DSM setting can be enabled on an action step under a time window condition.
- Nested time window conditions are not supported. For example, if time window is added in condition 1 then another time window condition in condition 2 cannot be added (where condition 2 is nested within condition 1).

When an installed app, that is, an app installed either through direct assignment or workflows is manually removed and re-installed through desired state management (DSM) enablement, the re-installation might not follow the defined time windows. The time window condition is checked before starting each app installation but a single app installation that has already started running inside a time window might continue to run outside the time window.

Note: Currently, the time window condition is only supported on the Windows 10 devices.

For more information on creating a time window resource, see the *Make a Time Window and Apply it to Devices* section in the *Managing Devices* guide.

Condition with Extended Device Attributes

An administrator can use the device attributes data, such as software, security, and system data to define a condition in a workflow. Using the attributes condition in the workflow you can filter and review any incoming extended device inventory data on the individual devices.

To view the Extended Device Inventory (EDI), navigate to **Devices** > **Details View** > **More** and click **Extended Device Inventory** to view the device details. When the EDI information is displayed, administrators can either scroll through the information or use the search bar to quickly find specific items.

Note - Extended Device Attributes are only supported on Windows devices.

Group

The group feature in a workflow enables an administrator to create a group and add all the required applications, profiles, or scripts to be installed on the devices simultaneously. For the resources within a group, the installation of the resources does not depend on the installation of any resource added in a workflow.

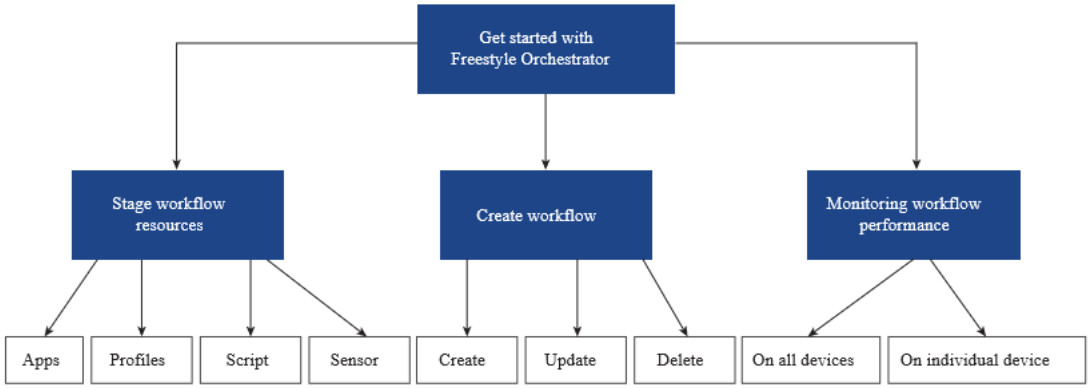
For example, the administrator can create a group to install all the productivity applications on the devices at the same time. In case, installation of any resource fails, then you can add a step in the workflow to continue the installation of the other resources or not install the other resources.

Getting Started with Freestyle Orchestrator

2

Freestyle Orchestrator workflows can be used with your direct resource deployments to meet your company's orchestration needs. Workflow management involves three main components as shown in the following illustration.

Figure 2-1. Freestyle Orchestrator Workflow Management



Learn how to create workflows with Freestyle Orchestrator in the following sections.

This chapter includes the following topics:

- Stage Workflow Resources
- Create your Workflow
- Monitor Workflow Performance
- Configure Default Settings for all Workflows

Stage Workflow Resources

Before you begin creating workflows, you must add the required resources to your system inventory. The resources can be applications, profiles, or scripts and they can be staged at your OG or the parent OG. However, you need not assign the resources to devices during the creation process.

For staging application resources, in addition to the package and metadata, you must create an app policy as the default policy when the app is used in any workflow for all your devices. When an app without a default policy assignment is selected in a workflow, you might see an error, and publishing the workflow is blocked until a default policy is created.

When you add a script or sensor resource, identify the trigger, and stage your script or sensor. For information about creating your resources, see the following topics:

- To create an application, and for more details about default policy creation, see the *Deploy Applications to devices* topic in the *Application Lifecycle Management* guide.
- To create a profile, see the *macOS Device Profiles* topic in the *macOS Device Management* guide and *Workspace ONE UEM Profiles for Windows* topic in the *Windows Desktop Documentation* guide.
- To create a sensor, see the *Collect Data with Sensors for macOS Devices* topic in the *macOS Device Management* guide and the *Collect Data with Sensors for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.
- To create a script, see the *Scripts for macOS Devices* topic in the *macOS Device Management* guide and the *Create a Script for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.

Create your Workflow

When all the required resources are added to the system inventory, you can start creating workflows. The following list describes the high-level steps to create a basic workflow:

1. Add a name to your workflow.
2. Select the platform and smart group for your workflow. All devices in the smart group to which the workflow is assigned, perform the actions specified in the workflow upon publish.
3. Add the resources to the workflow in the order you want the resources to be installed on the devices.
4. Save your workflow. At any time, you can open any saved workflow and modify the workflow as required.
5. Publish your workflow.

When you save and publish the workflow, the devices do not install the resources in the workflow immediately. When the device checks for any updates, the resources get installed only if the device is entitled to receive a workflow. The default device check-in interval time is 4 hours and can vary based on your configuration.

Note: After you save and publish a workflow, you cannot edit the **Platform** field of the workflow. If you try to change the platform associated with the workflow, the following warning message is displayed "Changing the platform will erase all the other resources, steps, actions you have entered into the workflow. Are you sure you want to continue?"

If you click **Change Platform**, then all the resources added to the workflow are deleted. However, the already selected **Smart Group** for the workflow is not impacted. Any number of smart groups can be added to the workflow at any time while creating the workflow.

For more information about creating workflows, see the following topics:

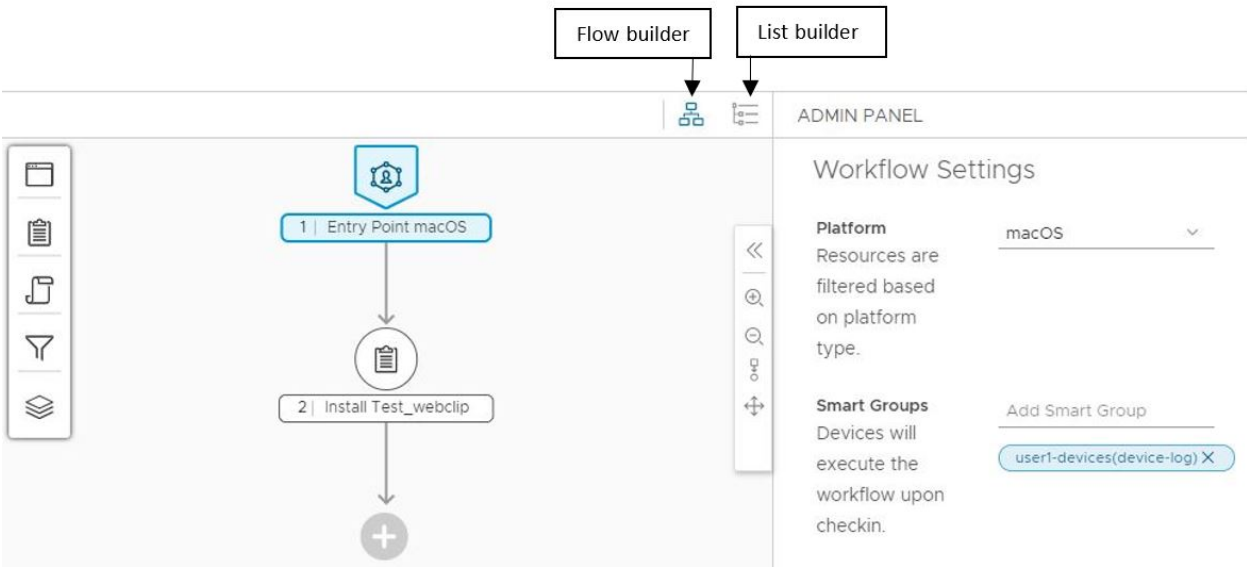
- Chapter 4 Sequence the Installation of Resources
- Chapter 5 Define Actions on Resources Using Conditions

Build Workflows using Freestyle Orchestrator List Builder or Flow Builder

An admin can build workflows using a list builder or a flow builder. A list builder helps admins to build workflows using a structured list whereas a flow builder helps admins to build workflows using free-form flowchart tools.

If a workflow is created in the flow builder and the admin switches to the list builder, the same workflow appears in the list builder. The following figure shows the list builder and flow builder icons displayed on the flow builder workflow screen.

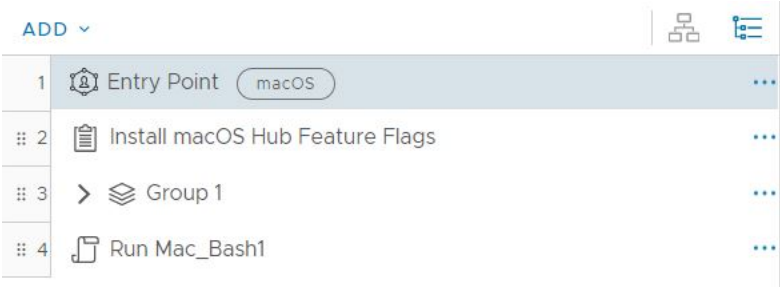
Figure 2-2. List Builder and Flow Builder Icons



A flow builder provides an interaction pane for the admins to create and visualize complex workflows having multiple branches with nested conditions. In a flow builder the workflow steps are displayed in the form of a flow chart. An admin can drag and drop any workflow resources such as apps, profiles and so on the flow builder canvas.

In a list builder all the steps in a workflow appear in the form of a list and the sub-steps in a workflow is indented within the steps. An admin can reorder the steps in a workflow after creating the steps in a workflow. The following figure shows an image of a list builder.

Figure 2-3. List Builder View



Monitor Workflow Performance

After you create and assign the workflows to the devices, you can monitor the progress of the workflow deployment. You can view the progress of the workflow for all the assigned devices, or you can view the progress of the workflow for individual devices. Navigate to the **Device details** page and check the workflow section for more details of individually targeted validations. Additional event logs for devices depict how the device is responding to the workflow.

Configure Default Settings for all Workflows

You can configure default settings for all your workflows and also override these settings in the individual workflows. To configure the default workflow settings, perform the following procedure:

1 Navigate to **Freestyle** > **Freestyle Orchestrator**.

2 Click the **Settings** option to open the workflow **Settings** page and enter the following fields.

Table 2-1. Freestyle Orchestrator Workflow Settings

Field	Default Value	Description
Timeout	720 minutes	The maximum time to wait for a workflow step to complete. Specify the value in minutes, days, or hours.
Retry After	200 hours	The time interval after which the workflow steps with errors are retried. Specify the value in minutes, days, or hours.
Maximum Retries	3	The maximum number of retries a system can perform to reinstall a workflow step or the workflow itself.
Backoff rate	1.5	A multiplier that determines the interval between subsequent retries.
Retry Interval	NA	Product of Retry After, Retry Number, and Backoff Rate.

3.Click **Save** to save the workflow settings. If there are no validation errors, the workflow settings are saved.

Note: The **Restore Defaults** restores all the default values of the workflow.

Lifecycle of a Workflow

3

The lifecycle of a workflow includes different phases. This section describes all the phases of a workflow.

This chapter includes the following topics:

- Save a Workflow without Publishing the Workflow
- Publish a Workflow on an End User Device
- Update a Workflow
- Pause a Workflow
- Delete a Workflow
- Freestyle Orchestrator Dashboard Details
- Configure On-Demand Workflow Deployment Options

Save a Workflow without Publishing the Workflow

An admin can create workflows and save the workflows at any time, even if the workflow state is incomplete. You can view all the saved workflows in Freestyle Orchestrator dashboard list view. You can resume editing of any saved workflow at any time. All the required elements and steps must be complete before publishing your workflow.

Publish a Workflow on an End User Device

When all the required elements within a workflow are complete and the workflow steps have no errors, you can publish the workflow to your end user devices. After you save and publish your workflow, the resources within a workflow do not get installed on the devices. When the device regularly checks for any updates, the workflow resources start installing. Once a workflow is published, any additional changes to the workflow are also published without an intermediate save option.

In an OG, multiple admins can modify an already published workflow. For example, an admin modifies a workflow and publishes the workflow, subsequently another admin also modifies the same workflow and publishes the workflow. As a best practice, before publishing a workflow, admins must enter the change log accurately to track the changes made to a workflow. The change log provides information about the changes made to the workflow and the admin details who modified the workflow.

Update a Workflow

After you successfully publish the workflow to the devices, you can modify the individual resources in a workflow or change the workflow itself. When you modify the workflow or the workflow resources, you create a newer version of the workflow. When a workflow is first saved and published the workflow version number is 1 and with every update to the workflow the workflow version number is incremented by 1. You can find the workflow version information in the header when you open a workflow's details page.

You can publish a newer version of the workflow to the devices. When the devices check-in for updates, the devices receive a new version of the workflow, else, the device is marked out-of-date.

Note: Changing the workflow assignments do not trigger a new version of the workflow.

As an admin, you can perform the following changes on the workflows:

- You can change the platform of the workflow while creating a workflow. If you change the platform, the following warning message appears: 'Changing the platform will erase all the other resources, steps, actions you have entered into the workflow. Are you sure you want to continue?'
- You can search for applications based on the following categories: Platform, Managed by, and Categories
- You can reorder the steps in a workflow after you create the steps in a workflow.
- When an admin selects an application based on an application name; the admin must be able to see all the available versions for a selected application at the OG where the application is managed.

Workflow Actions

When you navigate to **Freestyle** > **Freestyle Orchestrator** dashboard, select and click on a workflow, the workflow details page is displayed. The workflow details page lists all the devices that are assigned to this workflow. You can select a single device from the device list and perform actions such as **Sync workflow** and **Force execute** a workflow.

The **Sync workflow** option sends any updates to the device and fetches the workflow status information from the device. The **Sync workflow** action updates outstanding changes to all the workflows. To sync your workflow to devices, navigate to **Devices** > **List View** > Select and click on any device > click **More Actions** and select **Workflows**.

An admin can also select any device and force execute a workflow on the device. The **Force execute** action re-runs the entire workflow on the device irrespective of the previous state of the workflow, that is, even if the workflow execution is in progress or in a completed state, the workflow is again run on the device when you select the **Force execute** action. You can navigate to **Devices** > **Details View** > and click the **Workflows** tab and run the **Force execute** action to re-run the entire workflow on the device irrespective of the previous state of the workflow.

Pause a Workflow

In case, there is an issue with the workflow deployment, you can pause the deployment using the **Pause** action. The administrator can modify the workflow to make the necessary changes and resume the deployment of the workflow to the devices.

Delete a Workflow

You can delete a workflow when the workflow is no longer applicable to devices. If you have the permissions, you can delete any workflow created at a given organization group (OG). Deleting the workflow does not trigger the removal of resources from the assigned devices.

To delete a workflow, perform the following steps:

1 Open the Workspace ONE UEM console.

2 Navigate to **Freestyle** > **Freestyle Orchestrator** dashboard.

3 Select the workflow to be deleted and click **Delete**. The following warning message is displayed: 'Deleting this workflow will remove the resource assignment from the devices in this workflow. This action cannot be undone. Resources currently installed on the devices will remain unless manually removed. To remove the installed resources, navigate to the **Device Details** view for each device, or the **Assigned Devices view for each resource**. Do you want to continue?'

4 Click **Delete** to delete the workflow else click **Cancel** to retain the workflow. When you click **Delete**, the workflow is deleted from **Freestyle Orchestrator** dashboard.

Freestyle Orchestrator Dashboard Details

The Freestyle Orchestrator dashboard displays a list of all the workflows that are saved and published. You can navigate to **Freestyle** > **Freestyle Orchestrator** to view a list of all the workflows. The dashboard provides the following details of the workflow:

- Name of the Workflow
- Description of the workflow
- Number of resources assigned to a workflow
- Number of Smart groups associated with the workflow
- Organization group details that manage the workflow

- Platform assigned to the workflow
- Status of the workflow, whether the workflow is published, saved, or paused
- Date of creation of the workflow

You can also click on any individual workflow in the dashboard to view the details of the workflow. The following workflow details are displayed:

- Version - Displays the version of the workflow. The version of the workflow is incremented every time based on the updates made to the workflow.
- Created - Displays the date on which the workflow was created.
- Published - Displays the date on which the workflow was published
- Modified On - Displays the date on which the workflow was modified by the admin.
- Modified By - Displays the details of the admin who last modified the workflow.
- Managed By - Displays the OGs associated with the workflow.
- UUID - Displays the universal unique identifier (UUID) of the device.
- Change log - Displays the log details of the last modifications to a workflow.

Configure On-Demand Workflow Deployment Options

When admins create a workflow, the admins can configure deployment options for individual workflows. In the workflow **Admin Panel**, after you enter the **Platform** and select a smart group for your workflow the following deployment options are displayed:

- **Auto Deploy** - If this option is selected, upon device check-in, the workflow is automatically deployed on the end user's devices.
- **Show in App Catalog** - If this option is selected, you must enter the **Display Name** and optionally enter the **Display Description** and upload an image in the **Icon**. These options are displayed on the Workspace ONE Intelligent Hub catalog under the **Apps** section on the end user's device. The end users can click the install action and start the workflow installation immediately.

  The end users can view the assigned workflows in the Workspace ONE Intelligent Hub app catalog. The admins cannot view a list of devices that are assigned with a workflow immediately. But when the end user initiates the workflow installation at least once, then the devices start showing the workflow in the Workspace ONE Intelligent Hub app catalog. When you publish the workflow, you might not view any devices, but the end users can view the workflows in the Workspace ONE Intelligent Hub app catalog. Once the end users install the workflow, the admins can view the status of the workflow. There are no admin-side actions to force execute a workflow.

- **Auto Deploy and Show in App Catalog** - If this option is selected, the workflow is published to the devices on next check-in and the end users can view the workflow in their Workspace ONE Hub catalog under the **Apps** section. When required, the end user can initiate the workflow action.

Note: Admins can select either of the deployment options for their workflows. After the admins publish the workflow, the workflow is added to the Freestyle Orchestrator list view and is also displayed on the end users Workspace ONE Intelligent Hub app catalog.

Sequence the Installation of Resources

4

Workflows can be used to install resources in a specific order on your end user devices. You can sequentially install the resources during onboarding your devices into Workspace ONE UEM or when resources have dependencies. Sequencing of the following resources is supported:

- Application sequencing: An admin can sequence the installation of different applications during deployment. For example, install Outlook and then install Outlook plugins.
- Profile sequencing: An admin can sequence the installation of profiles with other resources. For example, install the Wi-fi profile before any other resources.
- Integrate scripts with workflows: An admin can run scripts on devices using workflows and sequence the running of scripts during deployment.

Note: In a workflow, you can only select the resources that are available in the system inventory and you cannot add resources from within the workflow. You can add resources into a workflow that is a part of your current organization group (OG) and your parent OG. However, you cannot view the resources managed at your child OG. To view the resources managed at your child OG, you must create a workflow at the child OG level. For more information about the usage of resources from various OGs, see the Chapter 8 Working with Freestyle Orchestrator on Multiple Organization Groups topic.

This chapter includes the following topics:

- Create a Workflow to Sequence the Installation of Applications
- Create a Workflow to Sequence the Installation of Profiles
- Create a Workflow to Sequence the Installation of Scripts
- Create a Workflow to Install a Group of Resources

Create a Workflow to Sequence the Installation of Applications

You can create a workflow to install all the applications in sequential order. The sequential installation of applications ensures that the installation of one application is successful before moving to the installation of another application.

The following procedure shows the steps to create a workflow to sequence the installation of applications. In this procedure, the administrator creates a workflow to install Outlook, Zoom, and Skype applications on the devices assigned to an organization group (OG). So, the administrator creates a workflow to first install the Outlook application and then install the Zoom and Skype Outlook plug-ins.

Prerequisites

Before you begin creating a workflow, you must add the Outlook, Zoom, and Skype applications to the app inventory. To add the required applications to the inventory, navigate to your organization group (OG), and follow the procedure at the *Deploy Applications to Devices* topic in the *Application Lifecycle Management* guide. You must also add default policies to each of these applications.

Procedure

The following procedure describes the steps to create a workflow to first install the Outlook application and then install the Zoom and Skype applications.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

5 In the left pane, click **Add** > **Resource** > **Application** to add an application to the workflow.

6 In the right Admin Panel, under the **Install Application** perform the following steps:

   a. In **Application**, click **Search and Select**, and enter **Outlook** in the **Search for an existing application**.

   Note: A list of all the available applications are displayed in the **Results** section.

   b. Navigate to the **Outlook application** and click **Select** to select the application.

   c. In the **Install Application** screen, click the **Version** to select the version of the Outlook application to be installed.

7 In the left pane, click **Add** > **Resource** > **Application** to add the Zoom application to the workflow.

8 In the right Admin Panel, under the **Install Application** perform the following steps:

   a. In **Application**, click **Search and Select** and enter **Zoom** in the **Search for an existing application**.

   b. Click **Select** to select the Zoom application.

   c. On the **Install Application** screen, click the **Version** to select the version of the Zoom application to be installed.

9 In the left pane, click **Add** > **Resource** > **Application** to add the Skype application to the workflow.

10 In the right Admin Panel, under the **Install Application** perform the following steps:

   a. In **Application**, click **Search and Select** and enter **Skype** in the **Search for an existing application**.

   b. Click **Select** to select the Skype application.

   c. On the **Install Application** screen, click the **Version** to select the version of the Skype application to be installed.

11 Click **Save** to save your workflow.

12 Click **Publish** to publish the workflow to all selected devices upon device check-in.

Note: You can create and save your workflow anytime without publishing the workflow to your end user devices. You can return to the Workspace ONE UEM console later to publish a saved workflow.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is assigned to the device, the Outlook application is installed first, followed by the Zoom and Skype applications, according to the order specified in the workflow. The sequential installation of applications ensures that all the applications are installed correctly.

Create a Workflow to Sequence the Installation of Profiles

The sequential installation of profiles ensures that a profile installation is complete before moving to the installation of another resource.

Note: Profile sequencing is supported on Windows and macOS platform. The profiles can be referred to in a workflow and assigned to a smart group only after the profiles are added to the system inventory.

The following procedure shows the steps to create a workflow to sequence the installation of profiles. In this procedure, the administrator creates a workflow to first install the passcode policy profile and then install the Wi-fi profile on the devices assigned to a particular OG.

Prerequisites

Before you begin creating a workflow, you must first create the passcode policy profile and the Wi-fi profile. For more information about creating profiles, see the *macOS Device Profiles* topic in the *macOS Device Management* guide and *Profiles for Windows Desktop* topic in the *Windows Desktop Documentation* guide.

In this example, the passcode policy profile is named **passcode-policy-profile** and the Wi-Fi profile is named **wifi-profile**.

Procedure

The following procedure describes the steps to first install the passcode policy profile and then install the Wi-fi profile.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

5 In the left pane, click **Add** > **Resource** > **Profile** to add a profile to the workflow.

6 In the right Admin Panel, under the **Install Profile** perform the following steps:

   a. In **Profile**, click **Search and Select**, and enter **passcode-policy-profile**.

   b. Select the **passcode-policy-profile** from the auto-populated list.

7 In the left pane, click **Add** > **Resource** > **Profile** to add another profile to the workflow.

8 In the right Admin Panel, under the **Install Profile** perform the following steps:

   a. In **Action**, select **Install**.

   b. In **Profile**, click **Search and Select**, and enter **wifi-profile**.

   c. Select the **wifi-profile** from the auto-populated list.

9 Click **Save** to save your workflow.

10 Click **Publish** to publish the workflow to all selected devices upon device check-in.

The following profiles need additional steps for using them in workflows:

- BIOS: To install a BIOS profile on a device, the Dell Command Monitor (DCM) app must be installed on the device. You must add the DCM app to your inventory, install the DCM app, and then install the BIOS profile. The workflow does not install the DCM app automatically unless the DCM app is added as an explicit step in the workflow.
- OEM updates: To install an OEM profile on a device, the Dell Command Update (DCU) app must be installed on the device. You must add the DCU app to your inventory, install the DCU app, and then install the OEM profile. The workflow does not install the DCU app automatically unless the DCU app is added as an explicit step in the workflow.
- Kiosk: To install the Kiosk profile and set up the Kiosk mode on your devices, you must add a workflow step to install the required apps in the Kiosk mode and then install the Kiosk profile.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is assigned to the device, as per the order specified in the workflow the **passcode-policy-profile** is first installed and then the **wifi-profile** is installed. The sequential installation of profiles ensures that all the profiles are installed correctly.

Create a Workflow to Sequence the Installation of Scripts

As an administrator, you can create a workflow to run scripts based on specific condition rules or in sequential order with other resources. The following procedure describes the steps to create an example workflow to use a sensor condition to determine if a device's printer access is enabled. If the printer access is not enabled, run a script on the device to refresh the printer configuration.

For more information about creating scripts, see the *Create a Script for macOS Devices* topic in the *macOS Device Management* guide and the *Create a Script for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.

Note: If you are publishing scripts to less than 2000 (default value) devices, the devices are notified immediately to fetch the resource. However, if the smart groups assigned have more than 2000 devices, then the devices will receive the resource the next time the devices checks-in with Workspace ONE UEM console.

Prerequisites

Before creating a workflow, you must first create the sensor to check the printer access. In this example, the macOS Bash sensor to check for printer access is named **printer_status** and the response data type is string.

```
/usr/bin/lpstat -p 2>/dev/null | awk '{print $5}' | sed '/^$/d'
```

If the printer is configured correctly, the sensor must return the string **enabled**. You can then create a script to refresh the printer service. For more information about creating scripts, see the *Create a Script for macOS Devices* topic in the *macOS Device Management* guide and the *Create a Script for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.

In this example, the macOS Bash script to refresh the printer service is named **refresh_printer**.

```
do
    /usr/bin/cancel -ax
    /usr/sbin/cupsdisable $printer
    /usr/sbin/cupsenable $printer
    echo "Refreshed $printer"
done
```

If the script runs successfully, it must complete with an exit (return) code of 0, in which the workflow updates the status as successful.

Note: The scripts can be added in workflow and assigned to a smart group only after the scripts are created.

Procedure

The following procedure describes the steps to create a workflow with a sensor condition to check the printer status on all devices in the assigned smart group and then run a script on devices that cannot access the printer to refresh the configuration.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

5 In the left panel, click **Add**, and select **Condition**.

6 In the right Admin Panel, under **Check Condition 1** enter a name for the condition - "Check Printer Status".

7 Click **If** > **Sensor** and click search in the Sensor screen.

   Note: In the **Filter (If)** screen, you can click the **Additional Settings** tab and enable the **Re-evaluate Condition** option. If there is any change in the sensor value or change in the workflow itself, this setting re-evaluates the condition and retriggers the workflow steps if needed.

8 Enter the sensor name **printer_status** and **Does Not Include** from the drop-down and enter **enabled** in the required information field.

9 Click **+ Then** > **Add** > **Resource** > **Script**.

10 In the right Admin Panel, click **Search and Select** under the **Run Script** > **Script**. All the available scripts are populated.

11 In the **Results** list, search for the **refresh_printer** script and click **Select**.

12 Click **Save** to save your workflow.

13 Click **Publish** to publish the workflow to all selected devices upon device check-in.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is assigned to the device, as per the order specified in the workflow, first the sensor to check for the printer status **printer_status** is run, and then if needed, the script to refresh the printer configuration **refresh_printer** is run.

Create a Workflow to Install a Group of Resources

An administrator can create a group in a workflow and add all the required applications, profiles, and scripts to be installed on the devices to the workflow. The resources added to a group do not follow any sequence during the installation. A combination of applications, profiles, and or scripts can be installed at the same time on the device.

In this example, an admin creates a group to install the Wi-Fi profile, the Global Protect application, and install the Google Chrome application on the device.

Prerequisites

Before you begin creating workflows, the admin must create a Wi-Fi profile, add the Global protect application, and the Google Chrome application to the system inventory. In this example, the Wi-Fi profile is named **wifi-profile**, the Global protect application is named **global-protect**, and the Google Chrome application is named **chrome**.

Note: Only after the application and profile are created, the application and profile can be added in a workflow and assigned to a smart group.

Procedure

The following procedure describes the steps to create a workflow to add a group to the workflow and add all the resources into the group.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

5 In the left pane, click **Add** > **Group** to add a group to the workflow.

6 In the right Admin Panel, under the **Group** enter a name for the group.

7 Click **Add** > **Profile**.

8 In the **Install Profile**, click search and select, and enter the **wifi-profile** to be added to the group.

9 Select the **wifi-profile** from the auto-populated list.

10 In the right Admin Panel, under the **Install Profile**, click **Add**, and select **Application** from the auto-populated list.

11 In the **Install application** screen, perform the following actions to add the Global protect application.

   a. In **Application**, click search and select the **global-protect** application to install. The Results section displays a list of all available applications.

   b. In **Version** select the version of the application to be installed.

12 In the right Admin Panel, under the **Install Application** page click **Add** and select **Application**.

13 In the **Install application** screen, perform the following actions to add the Google Chrome application.

   a. In **Application**, click search and select, enter **chrome** application to install. Select the **chrome** application from the auto-populated list.

   b. In **Version** select the version of the application to be installed.

14 Click **Save** to save your workflow.

15 Click **Publish** to publish the workflow to all selected devices upon device check-in.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is assigned to the devices, the resources in the workflow group start installing on device check-in.

Define Actions on Resources Using Conditions

5

An end user can install any software apart from the managed applications that are deployed through the Software Distribution client. For example, the end user can be an administrator or a standard user and can install applications such as iTunes, Chrome, on the user's device without triggering the User Account Control (UAC) prompt.

After the application is installed on the device, a newer version of the application might be released, and the old application versions are vulnerable to attacks. Sometimes, a zero-day vulnerability can occur without any ways to identify and remediate the application with an upgrade.

To mitigate such issues, administrators can create workflows to act on the resources based on certain conditions defined in the workflow. Various workflows can be defined based on the requirement. Workflows can be created based on the following criteria:

- Identify systems with a specific version of the software installed and provide a method of distributing a specific version of the software.
- Upgrade software without taking management of the affected software.
- Conditions based on the value of a sensor, whether a file exists at a specific path, or the values in a defined registry path.
- Schedule updates and deliver resources at a specific time for your business during which apps, profiles, and scripts are downloaded and installed.
- Configure workflow with conditions based on extended device inventory attributes.

This chapter includes the following topics:

- Create Workflow with the Application Name and Application Version Condition
- Create Workflow with the File Exists Condition
- Create Workflow with the Registry Exists Condition
- Create Workflow with the Sensor Value Condition
- Create Workflow with the Time Window Condition
- Create Workflow with the Attributes Condition

Create Workflow with the Application Name and Application Version Condition

As an administrator, you can create a workflow to apply conditions that filter an application based on the application name and application version. You can select the **Apps Exists** or **Apps Does Not Exist** values in a condition to preview the applications that match the condition. The applications that are present in the application inventory across devices are displayed.

Note: An administrator can create a condition to check if an application name and a specific application version are installed on a device. When the condition is run on a device, the device first checks if the application is installed on the device and populates the results. In the results populated, the device checks if the specific application version is installed. There is no accurate versioning syntax for the applications. So, applying criteria like greater than or less than for alphanumeric application versions might not provide accurate results. However, when the actual workflow runs on the devices the system performs a more accurate search and populates the results.

This example demonstrates a scenario where an admin creates a workflow and adds a condition to the workflow. The condition checks if the latest version of the Zoom application is installed on the devices in a smart group. The admin first checks the existing version of the Zoom application on the device. If the latest version of the Zoom application is not installed, then the admin creates a step in the workflow to install the latest version of the Zoom application.

Prerequisites

Before you begin creating a workflow, you must add the latest version of the Zoom application to your system inventory. To add the required applications to the system inventory, navigate to your organization group (OG), and follow the procedure described in the *Deploy Applications to devices* topic of the *Application Lifecycle Management* guide.

Procedure

The following procedure describes the steps to create a workflow that checks the existing Zoom application version on the device and install the latest version of the Zoom application on the device.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right **Admin Panel Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** that you want to assign this workflow.

5 In the left panel, click **Add**, and select **Condition**.

6 In the right **Admin Panel**, under **Check Condition 1**, enter a name for the condition.

7 Click **If** > **Application** > **Application Exists**.

8 In the **Filter (if)** screen, select **Application Exists**.

9 In the **Application name**, select **Contains**, enter the **Zoom** as the application name, and in the **Application version**, select **Less than or equal to**, and enter **5.0.2** as the application version.

   Note: In this example, the admin defines a condition to check whether the Zoom application exists, and if the application exists, check whether the application version is earlier than or equal to 5.0.2.

10 Click **Then** > **Add** > **Resource** > **App**.

11 In the **Install Application** screen, select **Install**, and enter **Zoom** in the **Application** option.

12 Select the Zoom application from the list that is auto populated and, in the **Version** drop-down menu, select **Latest**.

13 Click the **+ Then** and select **Else**.

14 In the right **Admin Panel**, click **Install Application**, and click **Else**.

15 On the **Else** screen, click **Add** to select **Proceed to next step**.

Note: If you want to change the action for the **Else**, then click the **Change Action** option in the Admin panel **Else Proceed to next step** screen.

1 Click **Save** to save your workflow.

2 Select your workflow from the Freestyle Orchestrator dashboard and click **Publish** to publish your workflow.

Results

You can view the workflow created in the **Freestyle Orchestrator** dashboard. When the devices check-in and the workflow are assigned to the devices, the device checks if the latest version of the Zoom application installed. If the version of the Zoom application installed is earlier than or equal to 5.0.2, then the device installs the latest version of the Zoom application.

Create Workflow with the File Exists Condition

You can use the condition feature of the workflow to check whether a specific file exists or does not exist on the device. In this example, the administrator creates a workflow to check if certain files in a specific path exist on the device. In case the file exists, then the admin can specify the actions to be taken for the file.

Note: The file condition is only supported on Windows devices and you cannot add a file condition for macOS devices.

Prerequisites

Before you begin creating a workflow, you must add the latest version of the Excel application, that is, 11.0.0 to your system inventory. After you add the application, you can refer to the application resource in a workflow. To add the required applications to the system inventory, navigate to your organization group (OG), and follow the procedure described in the *Deploy Applications to devices* topic of the *Application Lifecycle Management* guide.

Procedure

The following procedure describes the steps to create a workflow that checks whether a file in a location exists on a device. If the file exists, then the version of the application installed on the device is checked. If an earlier version of the application exists on the device, then the admin creates a step to install the latest version of the application.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right **Admin Panel Workflow Settings**, select the **Platform** from the drop-down, and select **Smart Groups** to which you want to assign this workflow.

5 In the left panel, click **Add**, and select **Condition**.

6 In the right **Admin Panel**, under **Check Condition 1**, enter a name for the condition.

7 Click **If** > **File**, and select **Exists** from the drop-down menu, and enter the following details:

   a. In **File Path**, select **Equals**, and enter **C:\program files (x86)\microsoft\office\root\office15\excel.exe**.

   b. In **Version Number**, select **Less than or equal to**, and enter **15.0**.

   c. In **Modified**, select **Before**, and enter a date to filter the files modified before a particular date.

8 In the **Filter (If)** screen, click **+ Then** > **Add** > **Resource** > **Application**.

9 In the **Install Application** screen, click on the **Search and select**, and enter **Excel**. Select the **Excel** application from the auto populated list.

10 In version, select **16.0.0** to be installed on the device.

11 Click **Save** to save your workflow. Workflow is saved and you can view the saved workflow in the Freestyle Orchestrator dashboard.

12 Select your workflow from the Freestyle Orchestrator dashboard and click **Publish** to publish your workflow.

Results

You can view the workflow created in the **Freestyle Orchestrator** dashboard. A workflow is created to check if the Excel file version 11.0.0 is available and if a lower version of the Excel is available then install the latest version.

Create Workflow with the Registry Exists Condition

You can use the condition feature of the workflow to check whether a specific registry key exists or does not exist on the device. In this example, the administrator creates a workflow to check if a registry key exists on the device, and if the registry key exists then the admin specifies an action to be taken for the registry key.

Note: The registry condition is only supported on Windows devices. You cannot add a registry condition for macOS devices.

Prerequisites

Before you begin creating a workflow, the Excel application must be added to the system inventory. To add the required applications to the system inventory, navigate to your organization group (OG), and follow the procedure described in the *Deploy Applications to devices* topic of the *Application Lifecycle Management* guide.

Procedure

The following procedure describes the steps to create a workflow to check whether a specific registry key exists on a device. If the registry key exists, then the admin creates a step to install the Excel application on the device.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right **Admin Panel Workflow** settings, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

5 In the left panel, click **ADD**, and select **Condition**.

6 In the right **Admin Panel**, under **Check Condition 1**, enter a name for the condition.

7 Click **If** > **Registry**, and select **Exists** from the drop-down and enter the following fields:

   a. In the **Registry Path**, select **Equals**, and enter **HKEY_LOCAL_MACHINE\SOFTWARE\Airwatch\Feature**.

   b. In the **Value Name** option enter **workflows**, in **Value type** option enter **string**, and in the **Value data** option enter **True**.

8 In the Filter (If) screen, click **+ Then** > **Add** > **Resource** > **Application**.

9 In **Action**, select **Install**, search for the **Excel** application, and select the application from the search results.

10 Select the **Version** to be installed from the drop-down menu.

11 Click **Save** to save your workflow. Workflow is saved and you can view the saved workflow in the Freestyle Orchestrator dashboard.

12 Select your workflow from the Freestyle Orchestrator dashboard and click **Publish** to publish your workflow.

Results

You can view the workflow created in the **Freestyle Orchestrator** dashboard. A workflow is created to check whether the **HKEY_LOCAL_MACHINE\SOFTWARE\AIRWATCH\Feature\workflows** registry exists on the devices, and if the value is true, then the system installs the Excel application on the devices.

Create Workflow with the Sensor Value Condition

The following procedure shows the steps to create an example workflow to use a sensor condition to determine if a device's printer access is enabled. If the printer access is not enabled, the procedure provides steps to run a script on the device to refresh the printer configuration.

For more information about creating sensors, see the *Collect Data with Sensors for macOS Devices* topic in the *macOS Device Management* guide and the *Collect Data with Sensors for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.

Prerequisites

Before creating a workflow, you must first create the sensor to check the printer access.

In this example, the macOS Bash sensor to check for printer access is named **printer_status** and the response data type is string.

```
/usr/bin/lpstat -p 2>/dev/null | awk '{print $5}' | sed '/^$/d'
```

If the printer is configured correctly, this sensor must return the string **enabled**.

Next, create a script to refresh the printer service. For more information about creating scripts, see the * Create a Script for macOS Devices* topic in the *macOS Device Management guide* and the *Create a Script for Windows Desktop Devices* topic in the *Windows Desktop Documentation* guide.

In this example, the macOS Bash script to refresh the printer service is named **refresh_printer**.

```
do
    /usr/bin/cancel -ax
    /usr/sbin/cupsdisable $printer
    /usr/sbin/cupsenable $printer
    echo "Refreshed $printer"
done
```

If this script runs successfully the script must complete with an exit (return) code of 0, in which the workflow updates the status as successful.

Procedure

The following procedure describes the steps to create a workflow with a sensor condition to check the printer status on all devices in the assigned smart group and then run a script on devices that cannot access the printer to refresh the configuration.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right **Admin Panel Workflow Settings**, select the **Platform** from the drop-down, and select **Smart Groups** to which you want to assign this workflow.

5 In the left panel, click **Add**, and select **Condition**.

6 In the right **Admin Panel**, under **Check Condition 1** enter a name for the condition. For example, **Check Printer Status**.

7 Click **If** > **Sensor** and click search in the Sensor screen.

   Note: In the **Filter (If)** screen, you can click the **Additional Settings** tab and enable the **Re-evaluate Condition** option. If the **Re-evaluate Condition** option is enabled, and the sensor value is modified or the workflow itself is modified, then if required, the condition is re-evaluated, and the workflow steps are retriggered.

8 Enter the sensor name **printer_status** and **Does Not Include** from the drop-down and enter **enabled** in the required information field.

9 Click **+ Then** > **Add** > **Resource** > **Script**.

10 In the right Admin Panel, click **Search and Select** under the **Run Script** > **Script**. All the available scripts are auto populated.

11 In the **Results** list, search for the **refresh_printer** script and click **Select**.

12 Click **Save** to save your workflow.

13 Click **Publish** to publish the workflow to all the selected devices upon device check-in.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is assigned to the device, as per the order specified in the workflow, first the sensor to check for the printer status **printer_status** is run and then if needed, the script to refresh the printer configuration **refresh_printer** is run.

Create Workflow with the Time Window Condition

As an administrator, you can use the time window condition to schedule updates and deliver resources at a specific time for your business. You can define one-time, daily, weekly recurring time windows during which apps, profiles, and scripts are downloaded and installed. You can select a time window category such as business hours or maintenance hours and choose to take actions when the device is *In* or *Not In* time window.

The Time window condition re-evaluates every 30 minutes until the device meets the criteria. If there are multiple actions within a Time window condition, the condition is evaluated before each step. To apply the time window resource to a device, you must reference the time window resource as a condition in a workflow.

Prerequisites

Before you begin creating a workflow to apply the time window condition to a device, navigate to your organization group (OG) and create a time window resource. To create a time window resource, see the *Make a Time Window and Apply it to Devices* section in the *Managing Devices* guide. The Skype and Zoom applications must be added to the system inventory before adding the application resources in a condition.

Procedure

The following procedure describes the steps to create a workflow with a time window condition to check if the devices in the assigned smart group are in their respective maintenance window and then install the Skype and Zoom applications.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right **Admin Panel Workflow Settings**, select the **Platform** from the drop-down, and select **Smart Groups** to which you want to assign this workflow. **Note**: Time window condition is only supported for Windows devices.

5 In the left panel, click **Add**, and select **Condition**.

6 In the right **Admin Panel**, under **Check Condition 1** enter a name for the condition. For example, **Time window condition**.

7 Click **If** > **Time Window** and enter the following details:

   a. Select **In** from the drop-down menu.

   b. Select **Maintenance Hours** from the drop-down menu.

   c. Click **Then** > **Add** > **Resource** > **Application**.

   d. Search and select the **Skype** application to be installed on the device during the defined device maintenance hour.

   e. Search and select the **Zoom** application to be installed on the device during the defined device maintenance hour.

8 Click **Save** to save your workflow.

9 Click **Publish** to publish the workflow to all the selected devices upon device check-in.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is run, the Skype and Zoom applications are installed when the devices are in their respective maintenance window.

Create Workflow with the Attributes Condition

As an administrator, you can use the attributes condition in a workflow to filter and review any incoming extended device inventory data on the individual devices.

In a scenario, where a problematic Bios Version has been identified on some devices, you can create a workflow to get a list of all the impacted devices where the specific Bios Version is present. For example, an OEM update application has upgraded some devices to Bios Version 6.0 which has an issue, and this Bios Version was applied to some devices. The following procedure shows the steps to create an example workflow to use the attributes condition to get a list of all the impacted devices with the problematic Bios Version and install an updated version of the Bios on the devices.

Prerequisites

Before you begin creating a workflow you must add the updated Bios Version 6.1 to your system inventory.

Procedure

The following procedure describes the steps to create a workflow and use the attributes condition in a workflow to obtain a list of all devices in a smart group with a specific version of the Bios Version installed.

1 Log in to the Workspace ONE UEM console.

2 Click **Freestyle** > **Freestyle Orchestrator** and click **New**.

3 Enter a name for the workflow in the **New Freestyle Workflow**. You can add an optional description to your workflow.

4 In the right **Admin Panel Workflow Settings**, select the **Platform** from the drop-down, and select **Smart Groups** to which you want to assign this workflow. **Note**: The software, system, and security device attribute condition are supported on Windows devices and the software and system attribute condition are supported on macOS devices.

5 In the left panel, click **Add**, and select **Condition**.

6 In the right **Admin Panel**, under **Check Condition 1** enter a name for the condition. For example, **Bios Version check condition**.

7 Click **If** > **Attributes** > **Software** and enter the following details:

   a. Click the **Select Attribute** > **System** > **Compute** > **Bios* > **Bios Version** and enter **6.0**.

   b. Click **Then** > **Add** > **Resource** > **Application**.

   d. Search and select the **Bios Version 6.1** application to be installed on the device

Note: The Bios application version 6.1 must be available in the system inventory for the application to be added in a workflow.

8 Click **Save** to save your workflow.

9 Click **Publish** to publish the workflow to all the selected devices upon device check-in.

Results

You can view the saved workflow in the **Freestyle Orchestrator** dashboard. When the workflow is run all the devices with the problematic Bios version are fetched and the updated version of the Bios application is installed.

Creating Workflows for Complex Profiles

6

Profiles are the primary means to configure your Windows 10 devices to connect to Wi-Fi, use a VPN, restrict access to settings, and more. For Windows platform, some of the profiles such as BIOS, Kiosk, and OEM Updates have dependency on the installation of certain applications before the profiles can be installed on the devices. For example, the OEM Updates and the BIOS profiles are dependent on Dell Command Update or Monitor apps and the Windows Kiosk profile is dependent on installation of few internal apps.

As an admin, you can use Freestyle workflows to sequence the installation of apps and profiles to the devices as desired. Using workflows, the admins can view the status of the installation of the apps and profiles on the devices. The BIOS, Kiosk, and OEM Updates profiles have an option in the profiles edit view to a create workflow for the installation of the profile. VMware recommends using Freestyle workflows to install these special profiles on your Windows devices.

The following sections describe the procedure to create workflows to install the BIOS, Kiosk, and OEM Updates profiles for Windows devices.

This chapter includes the following topics:

- Create a Workflow to Configure BIOS Profile on Windows Desktop Devices
- Create a Workflow to Configure OEM Updates Profile for Windows Desktop Devices
- Create a Workflow to Configure a Kiosk Profile for Windows Desktop Devices

Create a Workflow to Configure BIOS Profile on Windows Desktop Devices

Configure BIOS settings for select Dell enterprise devices with the BIOS profile. This profile requires integration with Dell Command | Monitor. For more information on configuring the BIOS Profile for Windows Desktop Devices, see the *Dell Command | Product Integrations* chapter in *Windows Desktop Documentation* guide.

Prerequisites

Before you create a workflow and install a BIOS profile, you must perform the following steps to add Dell Command Monitor (DCM) app to your inventory.

1 Add the DCM app to your inventory. For more information on adding DCM app to your inventory, see the *Add Dell Command | Update to Workspace ONE UEM* section in the in the *Windows Desktop Documentation* guide.

2 Save this profile without assignments.

Procedure

The following procedure describes the steps to create a workflow to install BIOS profile on Windows devices.

1 Navigate to **Freestyle** > **Freestyle Orchestrator** > **New** and enter a name in the **New Freestyle Workflow**.

2 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

3 In the left pane, click **+** and select **Resource** > **Application**.

4 In the right **Admin Panel** search and select **Dell Command Monitor (DCM)** app.

5 Click **+** and select **Resource** > **Profile**.

6 Search and add **BIOS** profile to your workflow.

7 Click **Save** to save your workflow.

8 Click **Publish** to publish your workflow to the devices upon device check-in.

Create a Workflow to Configure OEM Updates Profile for Windows Desktop Devices

Configure OEM Update settings for select Dell enterprise devices with the OEM Updates profile. This profile requires integration with Dell Command | Update.

Prerequisites

Before you create a workflow and install an OEM Updates profile, you must perform the following steps to add Dell Command Update (DCU) app to your inventory.

1 Add the DCU app to your inventory. For more information on adding DCU app to your inventory, see the *Configure the OEM Updates Profile* topic in the *Windows Desktop Documentation* guide.

2 Save this profile without assignments.

Procedure

The following procedure describes the steps to create a workflow to install OEM Updates profile on Windows devices.

1 Navigate to **Freestyle** > **Freestyle Orchestrator** > **New** and enter a name in the **New Freestyle Workflow**.

2 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

3 In the left pane, click **+** and select **Resource** > **Application**.

4 In the right **Admin Panel** search and select **Dell Command Update (DCU)** app.

5 Click **+** and select **Resource** > **Profile**.

6 Search and add **OEM Updates** profile to your workflow.

7 Click **Save** to save your workflow.

8 Click **Publish** to publish your workflow to the devices upon device check-in.

Create a Workflow to Configure a Kiosk Profile for Windows Desktop Devices

Configure a Kiosk profile to turn your Windows Desktop device into a multi-app kiosk device. This profile allows you to configure the apps that display in the device start menu.

Prerequisites

Before you create a workflow and install a Kiosk profile, you must perform the following steps to add all the required apps to your Kiosk profile.

1 Add all the required apps to include in Kiosk mode to your inventory.

2 Save the profile without assignments.

Procedure

The following procedure describes the steps to create a workflow to install Kiosk profile on Windows devices.

1 Navigate to **Freestyle** > **Freestyle Orchestrator** > **New** and enter a name in the **New Freestyle Workflow**.

2 In the right Admin Panel **Workflow Settings**, select the **Platform** from the drop-down menu, and select **Smart Groups** to which you want to assign this workflow.

3 In the left pane, click **+** and select **Group**.

4 Click **+** and select **Resource** > **Application** and add all the applications you want to include in the Kiosk mode.

5 Click **+** and select **Resource** > **Profile** and add Kiosk profile to the workflow.

6 Click **Save** to save your workflow.

7 Click **Publish** to publish your workflow to the devices upon device check-in.

Monitoring the Deployment of your Freestyle Workflow and Workflow Process

7

After you save and publish your workflow, you can monitor the deployment of your workflow on your end user devices. You can navigate to the Freestyle Orchestrator dashboard and select any published workflow to view the status of the workflow on all the devices or you can navigate to **Devices** > **Details View** and click the **Workflows** tab to view the status of the workflow on an individual device.

The workflow status is reported to the Workspace ONE UEM console once the device checks-in and the workflow starts running. Later, the workflow status is again reported in the following scenarios:

- Based on the configuration defined in the **Settings** > **Devices** > **Windows** > **Intelligent Hub** settings page, the completed step statuses for in progress workflows is reported every 30 minutes for Windows devices and every 1 hour for macOS devices. **Note**: For macOS devices, you cannot configure the frequency of the completed step statuses from the Workspace ONE UEM console.
- When the workflow completes successfully or fails.
- Along with the devices sample
- When the admin clicks the **Workflow sync** action from the **Device details** > **Actions** section.

You can view the status of an entire workflow on a device, or you can view the status of individual steps within a workflow per device. For all the devices assigned with a workflow, you can identify the devices that have successfully run the workflow, devices that are currently processing the workflow, and for the devices that are currently processing the workflow you can view the status of a workflow step and the number of devices that failed to run the workflow. The status of the individual workflows and the workflow steps are defined in the following table.

Table 6-1. Workflow Status

Workflow Status	Description
InProgress	Indicates that the device has received a workflow and the device is waiting to process the workflow or has actively started processing the workflow steps. See the workflow step details to know which step is actively running.
Completed	Indicates that the workflow has completed successfully.
Failed	Indicates that the workflow has failed to apply the workflow steps on the assigned devices. See the workflow step details to know which step failed to run.

Workflow Status	Description
Blocked	Indicates that the workflow is in a blocked state. For example, workflows can be blocked due to compliance actions, Windows App deployment agent missing on the device, invalid access token for a script download and so on.
CompletedWithException	Indicates that the workflow has completed successfully with one or more exceptions. The steps that the admins select as **skip on error** in the **Error handling** section are an exception in such cases.

Table 6-2. Workflow Step Status

Workflow Step Status	Description
ConditionNotMet	The condition in the workflow step is not met.
NotEvaluated	The workflow step is not evaluated.
InProgress	The step in the workflow is in progress state.
Completed	The step in the workflow is in the completed state.
Failed	The step in the workflow is in the failed state.
Blocked	The step in the workflow is blocked from running due to an external condition.
WaitingForEvent	The step in the workflow is waiting for an event to continue.
WaitingToBeRetried	The step in the workflow is waiting to be retried. You might see this workflow step status during the retry timeout period.

Note: A device reports the workflow status and the corresponding workflow step status when there is a change in the workflow state or when an admin or an end user initiates a device sync.

This chapter includes the following topics:

- Workflow Process
- Coexistence of Direct Assignments and Workflow Assignments for Resources

Workflow Process

When you publish a workflow, the devices receive the workflow during the next device check-in. By default, both Windows and macOS devices check-in every 4 hours for any device updates. But the check-in time for the devices in your environment might be staggered, so you must observe approximately 30 devices checking in every second.

Note: If a workflow is published to less than 2000 devices, then a notification is sent to the devices to check-in immediately. This enables your testing and pilot programs to run faster without any delays due to staggered check-ins.

Workflow Process upon Device Check-in

When the device checks-in with the Workspace ONE UEM, the device receives all information about the device entitlements and the system identifies the new or updated workflows. The device receives information about the updated or new workflows and starts running multiple workflows simultaneously.

Within a single workflow, the system fetches additional information about each step, depending on the resource, that is, if step 1 of the workflow includes app install, then the system fetches the app manifest. After evaluating the status of the previous step's completion, the system starts performing the next step in the workflow.

If a workflow step includes installing a group of resources, then all the resources within the group will start installing simultaneously. If a step in a workflow fails, the status of the step and the workflow will be marked as **Failed** unless the admin configured the option to **Skip step on error**. In this case, the workflow status is marked as **Completed with exceptions**.

If a step contains conditions, the conditions are evaluated to decide the next workflow path. The sensors are also re-run before evaluating the condition.

The workflow engine evaluates any time window conditions before starting each step under the time window branch.

Running Workflows without an Active User

The Windows devices check-in, fetch, and run the workflows even when there is no user actively logged in. All the resources that are configured on the admin console as **System context** are run even without an active user. When the workflow step contains a **User context** resource, the workflow will stop running and the status is updated as **Blocked**, and the status is sent to the admin console with a message **Waiting for user login**. In a workflow if there is a condition with **Evaluate without user** option then the condition is evaluated without an active user enrolled otherwise, the status of the workflow is updated as **Blocked**.

Workflow Status Updates

When the workflow starts running on the device, the first status is sent to the Workspace ONE UEM admin console immediately. In addition to the first workflow status, the completion (successful or failed) alerts are also sent to the Workspace ONE UEM admin console immediately. Additional step status updates of in-progress workflows are sent to the Workspace ONE UEM console at a default rate of 30 minutes for Windows devices and 1 hour for macOS devices.

Note: The beginning and completion alerts of workflows are grouped every 3 to 7 minutes on each device.

Coexistence of Direct Assignments and Workflow Assignments for Resources

Resources such as apps, profiles, and scripts are deployed to the devices through the workflows or direct resource assignments. Admins can select a smart group and assign any app, profile, or script directly or admins can create a workflow of multiple resources and assign the workflow to a smart group.

VMware recommends you deliver your resources to the devices either through direct resource assignments or by workflows, but not both. However, Workspace ONE UEM is built to support assignments from both the delivery systems. Devices receive the resources if the devices have assignments from at least one system.

Applications in Workspace ONE Intelligent Hub App Catalog

Applications are visible to the end-users only when the apps are directly assigned and the **Show in catalog** option is enabled. Using the workflow assignment, an admin can choose to display the entire workflow on an end-user catalog but cannot display the individual apps.

Deleting a Workflow

When a workflow associated with a resource is deleted but the direct app assignment still exists, then the app is not removed from the device and the assignment status shows as **Assigned**.

Note: If a device only had a workflow assignment, the resource is not removed from the device, but the assignment status gets updated to **Not Assigned**.

Deleting a Resource Assigned through Direct Assignment

When a direct assignment associated with a resource is deleted but the workflow assignment still exists, the resources are not removed from devices and the assignment status shows as Assigned.

Device Details and App Details Page

Admins can trigger install and remove actions for apps and profiles from the **Device Details** page and the **Apps Details** page when the assignments are made directly or through workflows.

Working with Freestyle Orchestrator on Multiple Organization Groups

8

An admin can create a workflow and assign the workflow to multiple organization groups (OGs). This topic provides more information about working with Freestyle Orchestrator on multiple OGs.

This chapter includes the following topics:

- Freestyle Orchestrator List View
- Access to Resources within Workflows
- View Workflow Details

Freestyle Orchestrator List View

Freestyle Orchestrator list view displays workflows created at the current organization group (OG), parent OG, and child OG. However, you must have permission to edit the workflows created at the current OG, parent OG, and the child OG. Freestyle Orchestrator list view displays the following information.

Table 7-1. Freestyle Orchestrator List View Options

Option	Description
Workflow name	Name of the workflow.
Description	Enter a description of the workflow.
Resources	Displays the number of resources referred to in a workflow.
Smart groups	Displays the smart groups assigned to a workflow.
Managed by	Displays the name of the organization group assigned to the workflow.
Platform	Displays the name of the platform to which the workflow is assigned.
Status	Displays the status of the workflow. The status can be saved or published.
Created	Displays the workflow creation date.

Access to Resources within Workflows

When you create workflows, you can use the resources from the organization group where the workflow is created and from the parent OG. You cannot use the resources from the child OGs to avoid incorrect assignment of child OG resources to devices from peer child OGs. The child OG admins have permission to use resources managed at the parent OGs within their workflows.

View Workflow Details

You can view details of all workflows from the Freestyle Orchestrator list view. You can view the list of devices assigned to the workflows that are managed at your OG and its child OGs. You cannot view the list of assigned devices and the statuses for workflows created at the parent OG.

Role-Based Access for Freestyle Orchestrator Workflows

9

Role-based access to Freestyle is key in providing access to the workflow functionality and resources within the workflows based on the individual roles of the administrators. An admin can create roles to perform the following tasks:

- Create, edit, publish, and delete a workflow
- Add or edit resources within a workflow

To create a new role, navigate to **Accounts** > **Administrators** > **Add Role** and click **Freestyle** > **Details** to view all the roles that an admin can create. For example, if an administrator has permission to add applications, but not publish the applications, then the admin can add apps to a workflow but cannot publish the workflow. The workflow permissions for an admin are described in the following list:

- The OG admin must have workflow permissions at the organization group (OG) the workflow is created to add or delete resources in a workflow.
- The child OG admins can add parent OG resources to their workflow without full management permissions on the parent OG.
- An admin at the current OG level has permissions to read workflows above and below their current OG level. When creating a workflow at the current OG, the admin cannot add resources that are managed at the child OGs, to avoid an incorrect assignment of child OG resources to the devices at the parent OG.
- If an admin has permissions at the higher OG, then the admin must be able to reference resources from an OG or inherited from a higher OG and assign the resources. For example, the admin must be able to assign or publish the resources as part of the workflow for applications managed at an OG or above the OG. The admin has permissions at the level the application is managed.

An admin can add or edit, delete, and view permissions for a workflow. Freestyle access permissions for the admin roles are described in the following table.

Table 8-1. Freestyle Orchestrator Role-Based Permissions

Category	Name	Description
Read	View Freestyle	Control access to view freestyle details and resource types like applications, profiles, and scripts.
Read	Navigation Freestyle	Control access to the Freestyle menu.
Read	Navigation Resources	Control access to the Resources menu.
Edit	Add or Edit Freestyle	Control access to create, edit, and publish freestyle and resource types such as applications, profiles, and scripts.
Edit	Delete Freestyle	Control access to delete freestyle and resource types like applications, profiles, and scripts.