Managing Workflows

This chapter contains the following sections:

Workflow Editing

You can edit many features of an existing workflow. You can:

- Rename a workflow
- Reorder inputs
- Delete inputs
- Rename inputs
- Change an input from optional to mandatory (but not the reverse)
- Edit tasks in the workflow

You can also:

- Delete any or all versions of a single workflow
- Delete the default version or all versions of multiple workflows at one time

The following sections describe these procedures.

Renaming Workflows

To rename a workflow, change its name field.

Note All versions of the workflow are renamed.

You cannot rename a compound task.

Before You Begin

You have selected the workflow you want to rename and chosen the **Edit** action.

Step 1 In the **Edit Workflow** screen, enter the new name for the workflow in the **Workflow Name** field.

Step 2 Click **Next**.

Step 3 In the **Add User Inputs** screen, click **Next**.

Step 4 In the **Add User Outputs** screen, click **Submit**.

Reordering Inputs

After creating a workflow, you can change the order in which workflow user inputs are processed when the workflow is executed.

Before You Begin

You have selected the workflow in which you want to reorder the inputs and have chosen the **Edit** action.

Step 1 In the **Edit Workflow Details** screen, click **Next** to advance to the input screen.

Step 2 In the **Edit User Inputs** screen, choose an input from the input table.

Step 3 Click the **Up Arrow** icon or **Down Arrow** icon to move the input up or down in the input order. Alternatively, you can drag and drop an input to a different place in the list.

Step 4 Click **Next**.

Step 5 In the **Edit Workflow Outputs** screen, click **Submit**.

Deleting Workflow Inputs

You can delete one or more inputs while editing an existing workflow.

Note You can also delete inputs in a cloned workflow.

To delete inputs from an opened workflow, do the following:

Before You Begin

Navigate to **Edit User Inputs** page:

1. Select the workflow from which you want to delete inputs.
2. Click **Edit** to open the **Edit Workflow** window.
3. Click **Next** to move to the **Edit User Inputs** page.

Alternatively, while editing a task, click **Manage Workflow User Inputs** on the **User Input Mapping** page.

Step 1 In the **Edit Workflow Inputs** list, select the inputs that you want to delete.
To select multiple inputs from the list, hold down the <Shift> key (for a range of items) or <Ctrl> key (to select individual items).

Step 2 Click the **Delete (X)** icon at the top of the list.

Step 3 In the **Delete Entry** popup dialog, click **Submit**.

What to Do Next

Click **Next** to move to the **Edit User Outputs** page, then click **Submit**.

Renaming Workflow Inputs

You can rename inputs while editing an existing workflow.

To rename inputs from an opened workflow, do the following:

Before You Begin

Navigate to the **Edit User Inputs** page:

1. Select the workflow in which you want to rename inputs.
2. Click **Edit** to open the **Edit Workflow** window.
3. Click **Next** to move to the **Edit User Inputs** page.

Alternatively, while editing a task, click **Manage Workflow User Inputs** on the **User Input Mapping** page.

Step 1 In the **Edit Workflow Inputs** list, select an input that you want to rename.

Step 2 Click the **Edit (pencil)** icon at the top of the list.

Step 3 In the **Edit Entry** popup dialog, replace the name in the **Input Label** text field.

Step 4 Click **Submit**.

Step 5 Repeat the previous steps to edit another input.

What to Do Next

Click **Next** to move to the **Edit User Outputs** page, then click **Submit**.

Changing Input Optional or Required Status

You can change the optionality (optional or required status) of workflow inputs.

Note You cannot map an optional workflow input to a mandatory task input. Similarly, you cannot change an input from mandatory to optional if it is mapped to a mandatory task input.

Before You Begin

Select the workflow you want to edit and choose the **Edit** action.

Step 1 In the **Edit Workflow** window, click **Next** to advance to the **Modify User Inputs** screen.

Step 2 In the inputs table, double-click an input that you want to edit.

Step 3 In the **Edit Entry** dialog box, check or uncheck the **Optional** check box to make the input optional or required, respectively, at the time of execution.

Note You cannot make a workflow user input optional if it is mapped to a mandatory task input.

Step 4 Click **Submit**.

Step 5 In the **Edit Workflow: Edit Workflow Inputs** window, click **Next**.

Step 6 In the **Edit Workflow: Edit Workflow Outputs** window, click **Submit**.

Editing a Task in an Existing Workflow

You can edit a task in an existing workflow. The change is local to the workflow and version containing the edited task. For example, if you edit task A in version 0 of workflow X, the task remains unchanged in workflow Y and in version 1 of workflow X.

Step 1 Open a workflow in the **Workflow Designer**.

Step 2 In the workflow display, double-click the task that you want to edit.
The **Edit Task** window appears.

Step 3 In the **Task Information** screen, you can edit the following fields:

Name	Description
Task Name field	You cannot change the name of the task.
Task Category drop-down list	You cannot change the task category.

Name	Description
Task Type drop-down list	You cannot change the task type.
Comment field	You can change or add to the comment.
Retry Execution check box	You can check or uncheck this box. If the box is checked, **Retry Count** and **Retry Frequency** controls appear.
Disable Rollback check box	You can check or uncheck this box. If the box is checked, the task is unchecked in the **Rollback Service Request** dialog and cannot be rolled back; see Rolling Back a Service Request. If the task does not support rollback, checking this box has no effect.
Retry Count drop-down list	The number of times (up to 5) to retry the task on failure.
Retry Frequency field	A comma-separated list of integers specifying how many seconds to wait between retries. For example, if you selected a retry count of three, enter 1, 10, 60 to retry after one, 10, and 60 seconds, respectively.

Step 4 Click **Next**.

Step 5 On the User Input Mappings page, you can edit the following fields:

Name	Description
Manage Workflow User Inputs button	Click this button to add to or edit the workflow user inputs.
Task Input headings	Each task input is displayed as a heading on the remainder of this page. The input is labeled **(Mandatory)** if it required.
Map to User Input check box	Check this box to populate the task input from a workflow user input at runtime.
User Input drop-down list	This drop-down list appears if you check the **Map to User Input** check box. Select the workflow user input to map to the task input.

Step 6 Click **Next**.

Step 7 On the **Task Input** page, you can edit the following fields:

Name	Description
(input label) control	Each task input that was not mapped to a user input on the previous page is displayed with an appropriate input control (text field, drop-down list, and so on). Use the input controls to specify the value. Optional inputs can be left blank.

Step 8 In the **User Output Mapping** screen, you can edit the following fields:

Name	Description
Task Output heading	Each task output is displayed as a heading on this page. The output is labeled **(Mandatory)** if it required. The output heading labels are assigned automatically and cannot be modified.
Map to User Output check box	Check this box to populate a workflow user output from the task output at runtime.
User Output drop-down list	This drop-down list appears if you check the **Map to User Output** check box. Select the workflow user output to map to the task output.

Step 9 Click **Submit**.

Deleting a Workflow

You can delete any or all versions of a workflow.

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflows** tab.

Step 3 Choose **Delete** from the task bar or from the actions drop-down list.

Step 4 In the **Delete Workflow(s)** dialog, choose the versions that you want to delete. To choose all versions for deletion, check the check box at the top of the list.

Step 5 Click the **Delete** button.

Deleting Multiple Workflows

You can delete more than one workflow at a time.

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflows** tab.

Step 3 Choose all the workflow you want to delete.

Note Select multiple items as you would in any other application on your system. For example, in Windows, hold down the **Ctrl** key to choose more items or **Shift** to choose a range of items.

Step 4 Choose **Delete All** from the task bar or from the actions drop-down list.

Step 5 In the **Delete Workflow** dialog, check the **Delete All Versions** check box if you want to delete all versions of the selected workflows. Otherwise only the default version is deleted.

Step 6 Click the **Delete** button.

Exporting and Importing Cisco UCS Director Artifacts

You can export and import workflows, custom tasks, script modules, and activities in Cisco UCS Director. This is useful if, for example, you want to:

- Move or copy workflows or other entities to different Cisco UCS Director instances.
- Back up or store entities.
- Use templates to standardize workflows.

Exporting and Importing Artifact Files

Cisco UCS Director artifacts are exported from and imported to Cisco UCS Director in a single package. The you exported or imported file has a `.wfdx` extension and is an XML file containing a serialized representation of the objects. The file contains at least one of the following:

- One or more workflows
- One or more custom tasks
- One or more script modules
- One or more activities

For example, you might import a file that contains only a single custom task; or a file that contains several workflows, a script module, and a few activities; and so on.

Exporting and Importing Workflows as Templates

You can export and import workflows as templates.

When you export a template, all of the tasks within the workflow are retained. When you create a new workflow using a template, task inputs that have been mapped to workflow inputs cannot be modified. However, you can modify inputs which have not been mapped.

Exporting Workflows, Custom Tasks, Script Modules, and Activities

To export artifacts from Cisco UCS Director, do the following:

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 In the **Orchestration** pane, click the **Workflows** tab.

Step 3 On the **Workflows** tab, click **Export**.

Step 4 In the **Select Workflows** screen, select the workflows that you want to export.

Step 5 Click **Next**.

Step 6 In the **Select Custom Tasks** screen, select the custom tasks that you want to export.

Step 7 Click **Next**.

Step 8 In the **Export: Select Script Modules** screen, select the script modules that you want to export.

Step 9 Click **Next**.

Step 10 In the **Export: Select Activities** screen, select the activities that you want to export.

Step 11 In the **Export: Confirmation** screen, complete the following fields:

Name	Description
Exported By text field	Your name or a note on who is responsible for the export.
Comments text area	Comments about this export.
Exported File Name text field	The name of the file on your local system. Type only the base filename; the file type extension (`.wfdx`) is appended automatically.

Step 12 Click **Export**.

You are prompted to save the file.

Importing Workflows, Custom Tasks, Script Modules, and Activities

To import artifacts into Cisco UCS Director, do the following:

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 In the **Orchestration** pane, click the **Workflows** tab.

Step 3 Click the **Import** action.

Step 4 In the **Import** dialog box, click **Upload**.

Step 5 In the **File Upload** dialog, click **Click and select a file from your computer**.

Step 6 Select the import file. Cisco UCS Director import and export files have a `.wfdx` file extension.
When the file is uploaded, the **File Upload** dialog displays `File ready for use`.

Step 7 Dismiss the **File Upload** dialog.

Step 8 Click **Next**.
The **Import** dialog displays a list of Cisco UCS Director objects contained in the uploaded file.

Step 9 (Optional) Specify how objects are handled if they duplicate names already in the workflow folder. In the **Import** dialog box, complete the following fields:

Name	Description
Workflows drop-down list	Choose from the following options to specify how identically named workflows are handled: • **Replace—**Replace the existing workflow with the imported workflow. • **Keep Both—**Import the workflow as a new version. • **Skip—**Do not import the workflow.
Custom Tasks drop-down list	Choose from the following options to specify how identically named custom tasks are handled: • **Replace** • **Keep Both** • **Skip**
Script Modules drop-down list	Choose from the following options to specify how identically named script modules are handled: • **Replace** • **Keep Both** • **Skip**

Name	Description
Activities drop-down list	Choose from the following options to specify how identically named activities are handled: • **Replace** • **Keep Both** • **Skip**
Import Workflows to Folder check box	Check this check box to import the workflows. If you do not check the box and if no existing version of a workflow exists, that workflow is not imported.
Select Folder drop-down list	Choose a folder into which to import the workflows. If you chose **[New Folder..]** in the drop-down list, the **New Folder** field appears.
New Folder field	Enter the name of the new folder to create as your import folder.

Step 10 Click **Import**.

Workflow Templates

A workflow template is like an outline of a workflow. It contains placeholders for all the tasks in the workflow, but is not executable.

A workflow template is useful when you want to import a workflow to a different Cisco UCS Director instance, especially if the workflow is large or contains custom tasks.

A workflow template contains the following elements:

- Task names. Only the names are exported; the tasks themselves must exist in the Cisco UCS Director environment in order to execute.
- Workflow structure (connections between tasks).
- Input names.

A workflow template does not contain these elements:

- Custom tasks. Since only task names are exported in a template, you must import custom tasks in the new Cisco UCS Director environment in order for them to execute.
- Admin input values. Since the elements referred to by input values are unlikely to exist in the new Cisco UCS Director environment, input values must be redefined.

Exporting Workflows as Templates

You can export a workflow as a template. To export a workflow as a template:

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflows** tab.

Step 3 Choose a workflow.

Step 4 Click **Export As Template**.

Step 5 In the **Export as Template** dialog, complete the following fields:

Name	Description
Template Name field	The name for the template.
Description field	A description of the template.

Step 6 Click **Submit**.
You are prompted to save the template to your system.

Note The template is saved under a system-generated filename. The template name you assign is for display in Cisco UCS Director only.

Importing a Workflow Template

To import a workflow template:

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflow Templates** tab.

Step 3 Click the **Import** action.

Step 4 In the **Import** dialog box, click **Upload**.

Step 5 In the **File Upload** dialog, click **Click and select a file from your computer**.

Step 6 Select the template file. Cisco UCS Director template files have a `.wft` file extension.
When the file is uploaded, the **File Upload** dialog displays `File ready for use`.

Step 7 Dismiss the **File Upload** dialog.

Step 8 In the **Import Template** dialog, click **Submit**.

The template appears on the **Workflow Templates** page.

Creating a Workflow from a Template

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflow Templates** tab.

Step 3 Choose a template.

Step 4 Click **Create Workflow**.

Step 5 In the Overview screen, complete the following fields:

Name	Description
Name text field	The name of the workflow to be created.
Description text area	An optional description for the workflow.

Step 6 Click **Next**.

Step 7 Click through the remaining pages of the Create Workflow from Template wizard. You can change any editable task-specific inputs that appear.

Step 8 Click **Submit**.

The workflow is created in the **Template Workflows** folder on the **Workflows** page.

What to Do Next

Open the workflow in the **Workflow Designer** and configure it to work in its new environment.

Predefined Templates

Cisco UCS Director installs with the following predefined templates. The templates are available, along with any user-imported templates, in the **Policies** > **Orchestration** > **Workflow Templates** tab.

Name	Purpose	Description
Customer Onboarding template	Customer onboarding in a secure multitenancy setting	The workflow does the following: • Creates a virtual data center (VDC) • Generates a VLAN from the selected VLAN policy • Creates a VLAN on the selected Cisco Nexus 5000 Series switches • Creates a port profile on selected Nexus 1000v Series switches • Creates a VLAN interface • Creates flexible volume • Creates and establishes a vFiler on the controller • Mounts the storage as a data store on a selected host node
Deploy ESXi Host template	Deployment of a new blade as an ESXi Host on a VMware (vCenter) account	The workflow does the following: • Creates a service profile • Associates the service profile to a selected server • Configures SAN zones on a Cisco Nexus 5000 Series switch • Establishes a PXE boot • Monitors PXE booting and registers the host with a selected VMware (vCenter) account
Deploy ESXi Host with ONTAP template	Deployment of a new blade as an ESXi Host on a VMware (vCenter) account.	Workflow does the following: • Creates a service profile • Associates the service profile to a selected server • Configures SAN zones on a Cisco Nexus 5000 Series switch • Establishes a PXE boot • Monitors PXE booting and registers the host with a selected VMware (vCenter) account

Name	Purpose	Description
Deploy ESXi Host of Local Storage (without a Cisco Nexus 1000v Series switch) template	Deployment of a new blade as an ESXi local storage host (without using a Cisco Nexus 1000v Series switch) on a VMware (vCenter) account	The workflow does the following: • Creates a service profile • Associates the service profile to a selected server • Configures SAN Zones on a Cisco Nexus 5000 Series switch • Establishes a PXE boot • Monitors PXE booting and registers the host with a selected VMware (vCenter) account
Attach VLAN to Storage Controller template	Attaching a NetApp storage controller's Ethernet ports to a new VLAN	The workflow does the following: • Generates a VLAN from the selected VLAN policy • Creates a VLAN on the selected devices • Creates a VLAN interface • Creates a vFiler on the controller

Workflow Version History

Cisco UCS Director provides a set of features for managing versions of a workflow. For an introduction to workflow versioning, see Workflow Versioning.

The following sections discuss how to manage workflow versions.

Creating a New Version of a Workflow

You can create a new version of a workflow. You can then modify the new version without changing the old version.

Before You Begin

You have an existing workflow that you want to modify.

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflows** tab.

Step 3 Choose the workflow to duplicate.

Step 4 Click the **Create New Version** action.

Step 5 In the **Create New Version** screen, complete the following fields:

Name	Description
Version Label field	The label for the version. The default label for a new workflow is zero, so consider labeling new versions numerically starting from one.
Description field	A description for the version.

Step 6 Click **Submit**.
The new version opens in the **Workflow Designer**.

Step 7 In **Workflow Designer**, complete your changes for the workflow.

Step 8 Click **Close**.

If the **Manage Versions** settings specify **Set latest version as default**, the new version becomes the default version. The **Workflows** page displays the new version of the workflow under the **Version** column.

If the **Manage Version** settings specify **Set selected version as default**, the new version is created but the default version does not change. See Choosing the Default Version of a Workflow, on page 15.

Choosing the Default Version of a Workflow

Step 1 On the menu bar, choose **Policies** > **Orchestration**.

Step 2 Choose the **Workflows** tab.

Step 3 Right click the workflow and choose **Manage Versions**.

Step 4 In the **Manage Versions** screen, complete the following fields:

Name	Description
Show latest version checkbox	Check this checkbox to set the default version of a workflow to be the last version that was created. The default version of a workflow is displayed in the **Workflows** page. If you create a new version of a workflow, the new version becomes the default. For example, if the latest version of a workflow is X.0, the **Version Label** column in the Workflows page displays X.0. If you then create a version X.1, the **Version Label** column displays X.1.
Set default version checkbox	Check this checkbox to set the default version of a workflow to be the version that you select. The default version of a workflow is displayed in the **Workflows** page. If you create a new version of a workflow, your selected version remains the default. For example, if the latest version of a workflow is X.0, the **Version Label** column in the Workflows page displays X.0. If you then create a version X.1, the **Version Label** column remains X.0.

Name	Description
Version list of values	If you selected the **Set default version** checkbox, check one version from the list to be the default version.

Step 5 Click **Submit**.

Managing Versions of a Compound Task

When you update a compound task, the new version of the compound task replaces the old one in all workflows that use the compound task.

However, it is possible for some versions of a workflow to be compound tasks while other versions of the same workflow are not. Normally, the behavior of a workflow is defined by the workflow's default version, but this is sometimes not the case with compound tasks.

If the default version of a workflow is not a compound task, then when the workflow is called as a compound task the system uses the most recent version of the workflow that is defined as a compound task. This can be confusing. The following example illustrates this behavior.

Before You Begin

1. Create a compound task called *CT*. Note that in the Workflow tab, the Version Label for *CT* is shown as 0. We will refer to this version of *CT* as *CTv0*.
2. Include the compound task in a workflow called *WF*.
3. Validate the workflow *WF*. Validation should pass.

Step 1 Save *CTv0* as a normal (non-compound-task) workflow:

a) Go to **Policies** > **Orchestration** > **Workflow**.
b) Choose the compound task workflow *CTv0*.
c) Click **Edit Workflow**.
d) Uncheck the **Save as Compound Task** checkbox.
e) Click through to the **Edit User Outputs** page and click **Submit**.

Step 2 In the **Workflow Designer**, validate *WF*.

a) Choose the **Workflows** tab.
b) Choose the workflow *WF*.
c) Click **Workflow Designer**.
d) In the **Workflow Designer** page, click **Validate Workflow**.

Validation fails with the message `The task "Compound add user" does not exist anymore.`

Step 3 Create a new version of *CT* (*CTv1*).

a) Choose the **Workflows** tab.

b) Choose the workflow *CTv0*.
c) Click **Create New Version**.
d) In the **Create New Version** dialog, enter the required fields:
   - Version Label - Something recognizable, for example v1.
   - Description - Any description.
e) Click **Submit**.
f) When the **Workflow Designer** comes up, click **Close**.
g) Click **Edit**.
h) Verify that for *CTv1*, the **Save as Compound Task** checkbox is unchecked.
i) Close the **Edit Workflow** page.

Step 4 Validate *WF* again, as in Step 2.
Validation fails with the message `The task "Compound add user" does not exist anymore.`

Step 5 Make *CTv1* a compound task.
a) Choose the **Workflows** tab.
b) Choose the workflow *CT*.
c) Click **Edit Workflow**.
d) Check the **Save as Compound Task** checkbox.
e) Click through to the **Edit User Outputs** page and click **Submit**.

Step 6 Validate *WF* again.
Validation is successful.

Step 7 Change the default version of *CT* back to *CTv0*.
a) Choose the **Workflows** tab.
b) Choose the workflow *CT*.
c) Click **Manage Versions**.
d) In the **Manage Versions** dialog, uncheck **Set Latest Version as Default**.
e) Check **Set Selected Version as Default**.
f) In the table, check *CTv0*.
g) Click **Submit**.

Note that in the **Workflows** tab **Version Label** is now *0*, indicating that *CTv0* is the default version of *CT*.

Step 8 Validate *WF* again.
Validation is successful. Note that *WF* is using *CTv1* as the compound task, even though *CTv0* is the default. Be aware that this can cause confusion if you have more than one version of a workflow that is used as a compound task.

Cloning a Workflow

You can clone a workflow. The cloned workflow is identical to the original workflow. You can edit the new workflow immediately. You might do this, for example, to create a workflow that is similar to the original workflow but which has different inputs. The new workflow has a new, separate version history.

Before You Begin

Navigate to **Policies** > **Orchestration** and select the **Workflows** tab.

Step 1 Select the workflow you want to clone.

Step 2 Click **Clone**.
The **Clone Workflow** window comes up.

Step 3 Edit the workflow details, inputs, and outputs. See Creating a Workflow. You must enter a new name for the workflow.

Step 4 Click **Next** to proceed to the **Workflow User Inputs** screen.

Step 5 Edit the workflow user inputs.

Saving a Picture of a Workflow

You can create a graphics image of a workflow. To capture an image, do the following:

Step 1 On the menu bar, choose **Policies** > **Organization**.

Step 2 Choose the **Workflows** tab.

Step 3 Choose a workflow.

Step 4 Click on **Workflow Designer**.

Step 5 From within the **Workflow Designer** window click the **Full View** icon.

Step 6 Click **Export as Image**.
You are prompted to save the image file.

Step 7 Choose a directory (if applicable) and click **Save**.

The saved file is named `workflow_nnn.png`, where nnn is the workflow ID number in Cisco UCS Director. The workflow ID number is visible in the upper left corner of the **Workflow Designer** next to the workflow name.