# Developing Workflows With VMware vCenter Orchestrator 5.1 Quick Reference

*Workflows consist of a schema, attributes, and parameters. The workflow schema is the main component of a workflow as it defines all the workflow elements and the logical connections between them. The workflow attributes and parameters are the variables that workflows use to transfer data. The process for developing a workflow involves a series of phases. You can follow a different sequence of phases or skip a phase, depending on the type of workflow that you are developing. For example, you can create a workflow without custom scripting.*

## Create a new workflow

1. From the drop-down menu in the Orchestrator client, select **Design**.
2. Click the **Workflows** view.
3. **(Optional)** Right-click the root of the workflows hierarchical list, or a folder in the list, and select **Add folder** to create a new workflow folder.
4. **(Optional)** Type the name of the new folder.
5. Right-click the new folder or an existing folder and select **New workflow**.
6. Name the new workflow and click OK.

## Create a Custom Action for a Workflow

1. From the drop-down menu in the vCO client, select **Design** and click the **Actions** view.
2. Expand the root of the actions list and navigate to the module in which you want to create the action.
3. Right-click the module and select **Add action**.
4. Type a name for the action in the text box and click OK.
5. Right-click the action and select **Edit**.
6. Click the **Scripting** tab.
7. To change the default return type, click the void link.
8. Add the action input parameters by clicking the arrow icon.
9. Write the action script.
10. Set the action permissions.
11. Click **Save and close**.

## Create a Workflow Schema

1. Click the **Schema** tab in the workflow editor.
2. Drag a schema element from the **Generic** menu in the left pane, to the workflow schema.
3. Double-click the element you dragged to the workflow schema, type an appropriate name, and press **Enter**.
4. Drag schema elements from the **Generic, Basic**, **Log**, or **Network** menus to the workflow schema.
5. In the **Filter** text box, type the name or part of the name of the workflow or action to insert in the workflow.
6. Double-click a workflow or action to select it.
7. Repeat this procedure until you have added all of the required schema elements to the workflow schema.
8. Create links between the elements to define the logical flow of the workflow:

- A blue arrow denotes the standard path that the workflow takes from one element to the next.
- A green arrow denotes the path that the workflow takes if a Boolean decision element returns true.
- A red dotted arrow denotes the path that the workflow takes if a Boolean decision element returns false.
- A red dashed arrow denotes the exception path that the workflow takes if a workflow element does not run correctly.

## Define the Parameters and the Input Parameters Dialog Box

1. Click the **Inputs** tab in the workflow editor and define the input parameters.
2. Click the **Outputs** tab in the workflow editor and define the output parameters.
3. In the workflow editor, click the **Presentation** tab.
4. Right-click the **Presentation** node and select Create new step.
5. Double-click the **New Step** node to provide it with an appropriate name and press Enter.
6. Click the input step and add a description in the **General** tab in the bottom half of the **Presentation** tab.
7. Right-click the input step you created and select **Create display group**.
8. Double-click **the New Group** node and provide it with an appropriate name.
9. Click the display group and add a description in the **General** tab in the bottom half of the **Presentation** tab.

## Define Elements Bindings

Bindings set data in the elements, and define the output and exception behavior of the elements. There are **IN bindings, that** set a schema element's incoming data and **OUT bindings that** change workflow attributes and generate output parameters when an element finishes its run.

1. Click the edit icon of the element.
2. Click the **IN** tab.
3. Choose an input parameter to bind, and click the **Not set** button in the **Source Parameter** text box. A list of possible source parameters and attributes to bind to appears.
4. Choose a source parameter to bind to the local input parameter or create a new one.
5. Click the **OUT** tab and choose a parameter to bind.
6. Click the **Source Parameter > Not set** button.
7. Choose a source parameter to bind to the output parameter or create a new one.

## Set the Parameter Properties

1. Click a parameter in the Presentation tab and click the parameter's Properties tab.
2. Select a property from the list presented in the dialog box and click OK.
3. Under Value, make the property value either static or dynamic.
4. If you set the property value to static, you select a property value according to the type of parameter for which you are setting the properties.
5. If you set the property value to dynamic, you define the function to obtain the parameter property value by using an OGNL expression.

## Resources and Links

- http://www.vmware.com/support/pubs/orchestrator_pubs.html - vCO docs
- http://blogs.vmware.com/orchestrator/ - vCO blog
- http://www.vcoteam.info/ - Unofficial blog of the vCO team
- https://www.facebook.com/vmwarevco - VMware vCO Facebook page

## Schema Elements

| Name | Description | Icon |
|---|---|---|
| Start Workflow | Starting point. | |
| Scriptable Task | General purpose tasks(JavaScript). | |
| Decision | Boolean function. take one input parameter and return either true or false. | |
| Custom Decision | Boolean function. Can take several input parameters and return either true or false. | |
| Decision Activity | Boolean function. Runs a workflow and binds its output parameters to a true or a false path. | |
| User Interaction | Allows users to pass new input parameters into the workflow. | |
| Waiting Timer | Set the workflow into a passive state. You set a date at which the workflow resumes running. | |
| Waiting Event | Set the workflow into a passive state. You define a trigger event that the workflow awaits before it resumes running. | |
| End Workflow | End point. | |
| Thrown Exception | Creates an exception and stops the workflow. | |
| Workflow Note | Allows you to annotate sections of the workflow. | |
| Action Element | Calls on an action from the vCO libraries. | |
| Workflow Element | Starts another workflow synchronously. | |
| Foreach Element | Runs a workflow on every element from an array. | |
| Schedule Workflow | Creates a task to run the workflow at a set time, then the workflow continues its run. | |
| Nested Workflows | Starts several workflows simultaneously. | |
| Pre-Defined Task | Noneditable scripted elements for common tasks | |