

Foglight™ for Automation 5.6.3.4
User and Reference Guide



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Legend

- **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.

- ! **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

- i **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

Foglight for Automation User and Reference Guide
Updated - May 2017
Software Version - 5.6.3.4

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Getting Started with Automation

This User and Reference Guide provides configuration instructions, conceptual information, and instructions on how to use the Foglight for Automation Managing Automation in Virtual Environments.

This guide is intended for Foglight for Automation users and administrators who configure and use the Managing Automation in Virtual Environments. It guides you through the interface, explains the concepts of workflow management and remediation mapping, introduces the Workflow Studio functionality, and more.

This chapter provides an overview of Automation concepts and a quick introduction to working with the Foglight for Automation. It also provides information about how to view the summary level information for the cartridge.

Automation Concepts

The Foglight for Automation Managing Automation in Virtual Environments provides you with tools to automate virtual environment management. With the Managing Automation in Virtual Environments, you can control virtual resources by designing and executing workflows that implement custom business logic. The Workflow Studio, a module of the Managing Automation in Virtual Environments, runs the visual environment where you can design workflows. For more information, see [Using the Workflow Studio](#) on page 13.

A common workflow consists of blocks called *actions*. An action is a basic operation that is performed against a virtual resource or workflow. For example, a single action is used to start a virtual machine (VM), stop a VM, or get a VM state.

When designing a workflow, you add actions to the Workflow Studio workspace and link them. By applying conditions to links you can program the workflow business logic. For example, you can create workflows for backup and restore procedures, for virtual environment monitoring, and for provisioning. For more information, see [Managing Workflows](#) on page 13.

To execute a workflow you must first create a task for that workflow. You can run a task immediately or schedule it. By modifying the workflow parameters you can execute a task against different objects. For example, if you need to create a backup copy of a virtual machine, you can use the name of that virtual machine as a parameter of the workflow that creates backup copies. For more information, see [Managing Tasks](#) on page 24.

You can use workflows to remediate events that occur in your virtual environment. For example, you can design a workflow that automatically allocates additional resources for some important process. Another example is a workflow that informs you about the warnings and failures that may occur in your virtual environment. The Remediation Mapping module enables you to assign workflows to various kinds of events. For more information, see [Managing Remediation Mapping](#) on page 28.

Actions are grouped into ActionPacks. Depending on your version of the Foglight for Automation Foglight for Automation, different ActionPacks may be included in the download. You can install additional ActionPacks or create your own ActionPacks. For more information about specific actions, see the ActionPacks documentation.

Getting Started

You can control workflows, tasks, scheduling, remediation and other components of the Managing Automation in Virtual Environments from the Automation dashboard.

To open the *Managing Automation in Virtual Environments* dashboard:

- On the navigation panel, under Homes, click Automation.
The Automation dashboard opens. From this dashboard you can view the summary information, manage tasks and workflows, and manage remediation mapping.

Next Steps

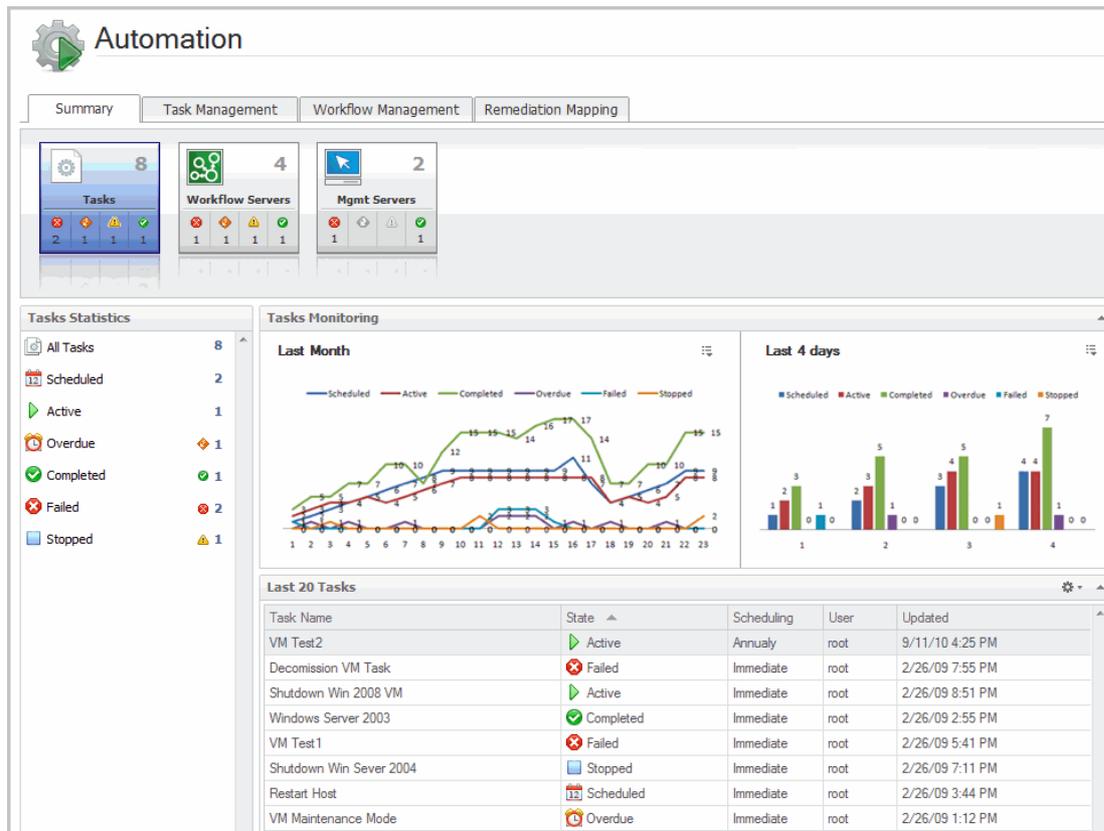
- To view the general information about Automation resources and processes, click the **Summary** tab. On this tab you can inspect the tasks, workflow servers, management servers, network, CPU utilization, notifications, warnings, and more. For more information, see [Summary View](#) on page 7.
- To work with tasks, click the **Task Management** tab. On this tab you can create, edit, duplicate, run, and stop tasks, customize task execution parameters, and assign values to task variables. For more information, see [Task Management View](#) on page 10.
- To manage workflows, click the **Workflow Management** tab. On this tab you can create, edit, duplicate, export, and import workflows, and run tasks based on workflows. For more information, see [Workflow Management View](#) on page 11.
- To control remediation, click the **Remediation Mapping** tab. On this tab you can explore the rules, and organize and assign workflows to rules. For more information, see [Remediation Mapping View](#) on page 12.

Summary View

The Summary tab provides general information about the Automation resources and processes, and allows you to:

- Quickly browse through the various categories of tasks (for example, running, scheduled, completed, and failed).
- Check the workload on the Workflow Servers and Management Servers.
- View the Notification Messages and Warnings.

Figure 1. The Summary tab provides you with the overall view of the current state of Foglight for Automation.



To view the summary information:

- 1 On the navigation panel, under Homes, click Automation.
- 2 Click the Summary tab.

The Summary tab contains three tiles:

- Tasks—allows you to browse through the tasks, filter the tasks by a category, inspect the task execution statistics, and view the notifications and alarms.
- Workflow Servers—allows you to inspect the load on the servers that run workflows, and view the notifications and alarms.
- Management Servers—allows you to inspect the load on the Foglight for Automation Management Servers, and view the notifications and alarms.

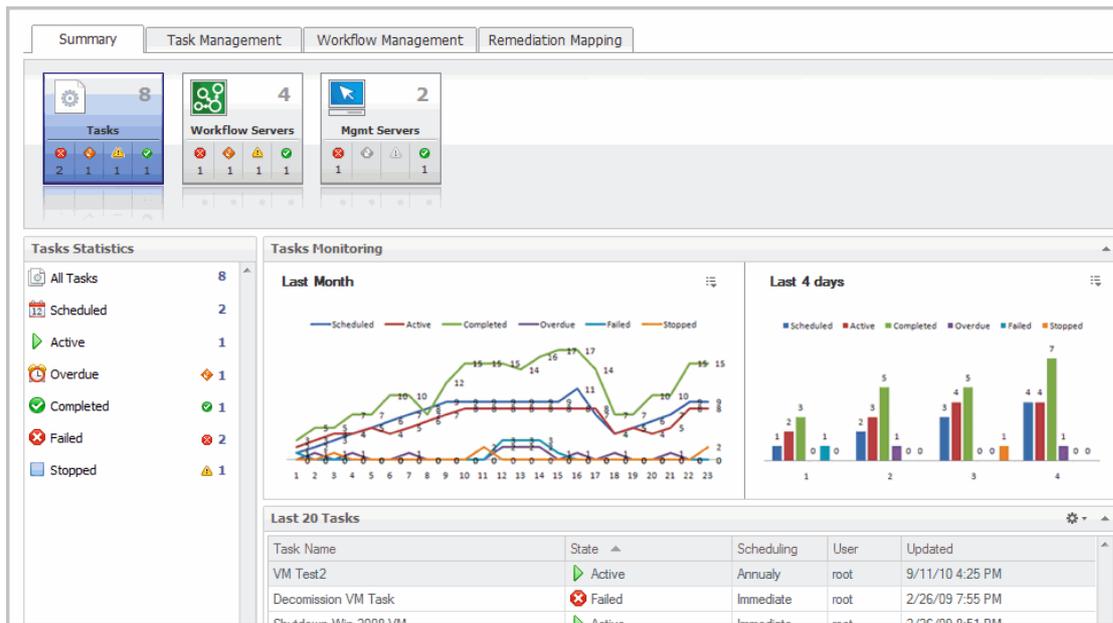
Tip If the tasks you execute fail, check the Workflow Servers and Management Servers operating state and workload. The failure may be caused by a heavy load on the Workflow and/or Management Servers.

Viewing the Tasks Summary

To view the Tasks Summary:

- On the Summary tab, click the Tasks tile.

Figure 2. The Tasks Summary view opens.



The Tasks Summary contains two views: Task Statistics and Task Monitoring. The Tasks Statistics view lists task categories. To view the tasks for a particular category, click the category in the list. The summary information about the tasks of the selected category appears in the Tasks Monitoring view. You can see the task execution statistics for either the last month or the last 4 hours.

Viewing the Workflow Servers Summary

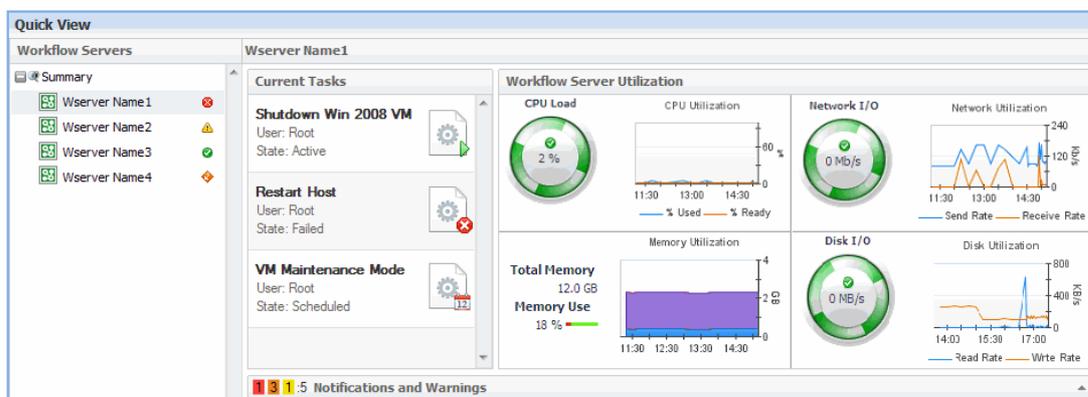
To view the Workflow Servers summary:

- On the **Summary** tab, click the Workflow Servers tile.

The Workflow Servers Summary view opens.

The Workflow Servers Summary contains two views: Workflow Servers and Summary. The Summary view on the right changes depending on the selection in the Workflow Servers list on the left. Select a workflow server from the list to view its utilization statistics in the Details view.

Figure 3. The Summary view displays information about the System Alarms and Changes below the workflow server statistics.



To view detailed information about an alarm, error, related host, or related agent, hover the cursor over its icon. A dwell appears, containing detailed information about the selected entity.

Viewing the Management Servers Summary

To view the Management Servers summary:

- On the **Summary** tab, click the Management Servers tile.

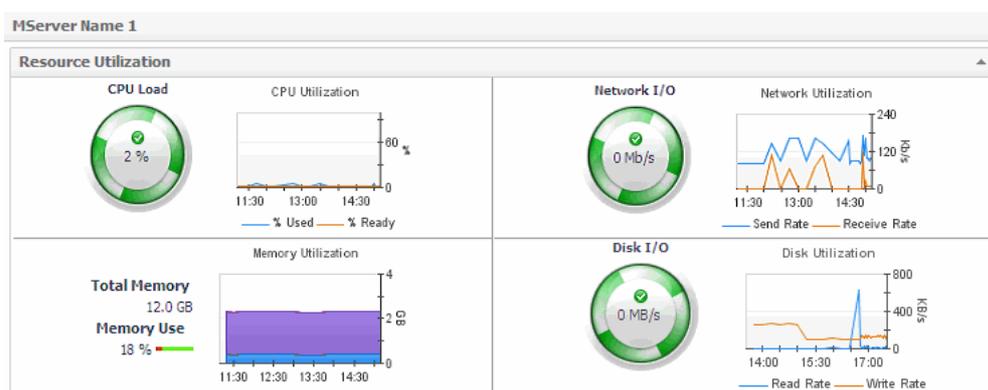
The Management Servers Summary view opens.

The Management Servers view displays statistical information about server resource utilization, while alarms and system changes appear in the Summary view.

Select a management server from the list to view its operational status. The Resource Utilization view displays information about the following parameters of the selected management server:

- CPU Load
- Network Input/Output (I/O)
- Memory Utilization
- Disk Input/Output (I/O)

Figure 4. The Summary view below management server statistics displays information about the System Alarms and Changes.



To view detailed information about an alarm, error, related host, or related agent, hover the cursor over its icon. A dwell appears, containing detailed information about the selected entity.

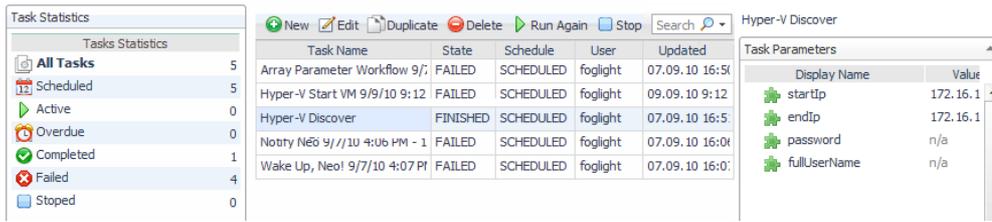
Task Management View

The Task Management tab lists all tasks registered in Automation. From this tab you can view and manage tasks.

To manage tasks:

- 1 On the navigation panel, under Homes, click Automation.
- 2 Click the Task Management tab.

Figure 5. The Task Management view opens.



The Task Management view helps you do the following:

- **Task Statistics** — Browse through the tasks of various categories, such as: Scheduled, Active, Overdue, Completed, Failed, and Stopped. Click a category to view the tasks. Click All Tasks to view all tasks registered in Automation.
- **Task List** — Review a list of tasks in the selected category. For example, if you select Failed in the Task Statistics list, only failed tasks appear in the Task List.
- **Details** — Review the properties of the selected task. You can view the information about a task, see who created it, view the workflow steps that the task runs, examine and modify the resources assigned to a task, and more.

For more information about task management, see [Managing Tasks](#) on page 24.

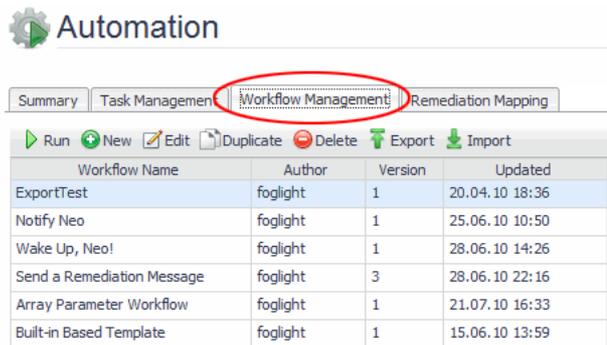
Workflow Management View

Workflow management views are located on the Workflow Management tab of the Automation dashboard.

To view workflows:

- 1 On the navigation panel, under Homes, click Automation.
- 2 Click the Workflow Management tab.

Figure 6. The Workflow Management view opens.



The Workflow Management view provides the following information:

- **Workflow Library** — A list of all workflows available in Automation. Select a workflow from the list to view its properties.
- **Details** — A list of the properties of the workflow selected in the Workflow Library list. You can view the actions and parameters of a workflow.

For more information about workflow management, see [Managing Workflows](#) on page 13.

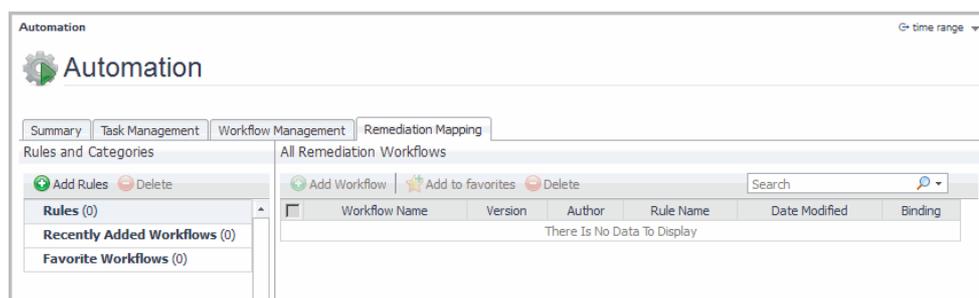
Remediation Mapping View

The Remediation Mapping views are located on the Remediation Mapping tab of the Automation dashboard.

To manage remediation mapping:

- 1 On the navigation panel, under Homes, click Automation.
- 2 Click the Remediation Mapping tab.

Figure 7. The Remediation Mapping view opens.



The Remediation Mapping view provides the following:

- Rules and Categories — A list of the currently mapped rules. Select a rule to view the assigned workflows.
- All Remediation Workflows — A list of all the workflows assigned to the currently selected rule.

For more information, see [Managing Remediation Mapping](#) on page 28.

Managing Automation

This chapter provides an overview of how to design and manage workflows, tasks, and remediation mapping.

Managing Workflows

Using the toolbar on the Workflow Management tab of the Automation dashboard, you can perform the following operations:

- Run a task based on a workflow. See [Executing Workflows](#) on page 22.
- Create a new workflow. See [Using the Workflow Studio](#) on page 13.
- Edit a workflow. See [Using the Workflow Studio](#) on page 13.
- Duplicate a workflow. See [Duplicating Workflows](#) on page 23.
- Export or Import a workflow. See [Exporting and Importing Workflows](#) on page 23.
- Delete a workflow.
- To quickly find a workflow, type its name in the Search field and click Search.

Using the Workflow Studio

You can create new workflows and modify the existing workflows in the Workflow Studio, which provides you with a visual environment.

To design a workflow:

- 1 Open the Workflow Studio by clicking New or Edit on the toolbar of the Workflow Management view. For more information, see [Opening the Workflow Studio](#) on page 13.
- 2 Drag one or more actions to the Workflow Studio workspace. For more information, see [Adding Actions](#) on page 15.
- 3 Connect actions with links. For more information, see [Connecting Actions](#) on page 16.
- 4 Specify link conditions. For more information, see [Designing Branched Workflows](#) on page 17.
- 5 Specify action parameters. For more information, see [Assigning Values to Action Links](#) on page 18.
- 6 Save the workflow. For more information, see [Executing Workflows](#) on page 22.

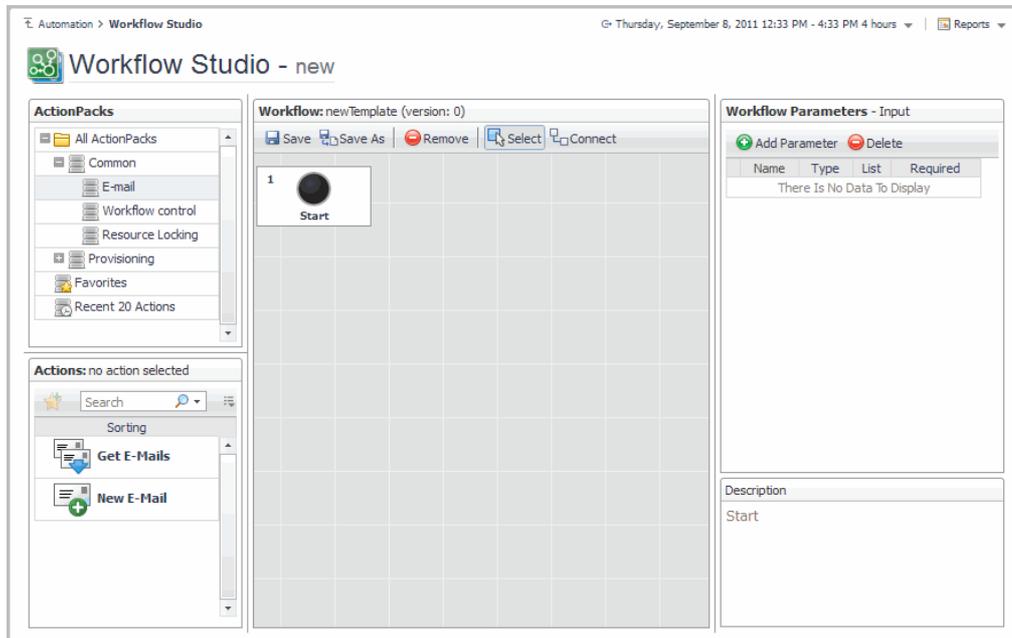
Opening the Workflow Studio

To open the Workflow Studio:

- 1 On the navigation panel, under Homes, click Automation.
- 2 Click the Workflow Management tab.

- Click New on the toolbar to create a new workflow, or click Edit to open an existing workflow in the Workflow Studio.

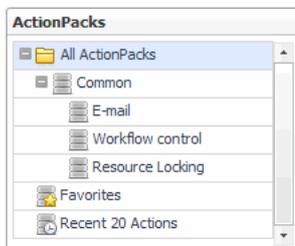
Figure 8. The Workflow Studio opens.



Overview of the Workflow Studio Interface

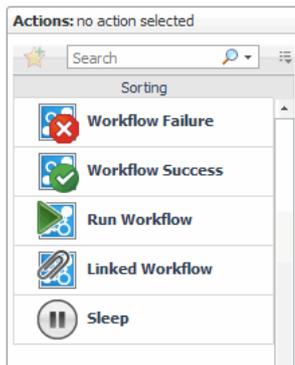
The Workflow Studio contains the following views:

- ActionPacks:** lists the installed ActionPacks.

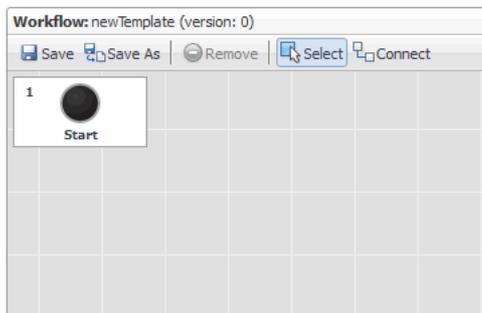


NOTE: The actual list of installed ActionPacks varies depending on the version of the Foglight for Automation and the ActionPacks that you have installed.

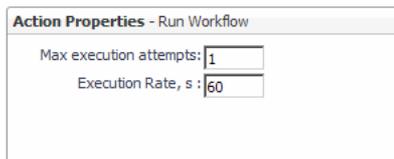
- Actions:** lists the actions included in the currently selected ActionPack.



- **Workspace:** the area in which you build workflows.



- **Action Properties:** displays the properties of the currently selected action or link. When no action or link is selected, this pane displays the Workflow Parameters instead.



- **Workflow Parameters:** displays a list of workflow parameters when no action or link is selected in the workspace.
- **Description:** displays the description of the currently selected action or link.

The Workflow Studio toolbar, located at the top of the Workspace view, contains buttons to control the workflows. Use it to save, run, create links, or delete workflows.

Designing Workflows

Using the Workflow Studio, you can easily design workflows by dragging and dropping actions onto the workspace, linking them, and editing their properties or parameters.

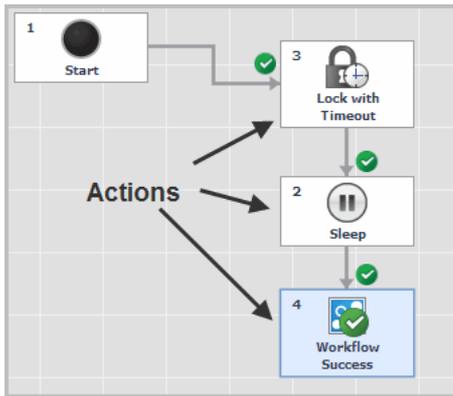
Adding Actions

To design a workflow, drag actions to the Workspace and connect them with links.

To add an action to the Workspace:

- 1 With the Workflow Studio open, select an action pack from the ActionPacks pane.
- 2 On the Actions pane, select an action.

- 3 Drag and drop the action on the Workspace.



Switching Between Select and Connect Modes

There are two design modes in Workflow Studio: Select mode, and Connect mode.

- In Select mode, you work with actions, and specify the properties of actions and links. You can drag new actions to the workspace, change the position of the actions on the workspace, and select connections.
- In Connect mode, you can draw connections between actions.

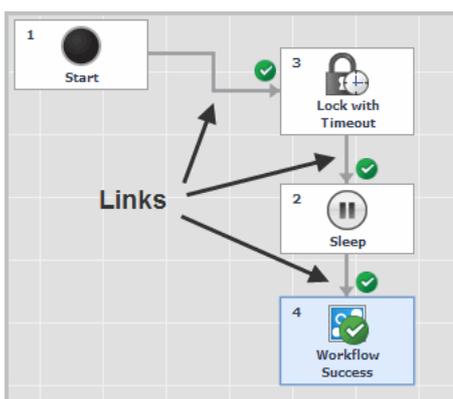
To switch between Select and Connect modes, click Select or Connect on the toolbar.

Connecting Actions

A workflow is executed in the order specified by the configured links.

To connect actions:

- 1 Switch to Connect mode by clicking Connect on the toolbar.
- 2 Draw connections between actions by clicking on the action that occurs first (for example, Lock with Timeout), and then clicking on the next action in the sequence (for example, Sleep).



i **IMPORTANT:** Workflows are executed from the Start action, which is placed by default on any workflow you create or edit. Connect the Start action to the first action to execute. You cannot draw a link that ends at the Start action.

Removing Actions and Links

To remove an action or a link from a workflow:

- 1 Switch to Select mode (click **Select** on the Workflow Studio toolbar).
- 2 Select the action or link that you want to remove.
- 3 On the toolbar, click Remove, or press the Delete key on your keyboard.

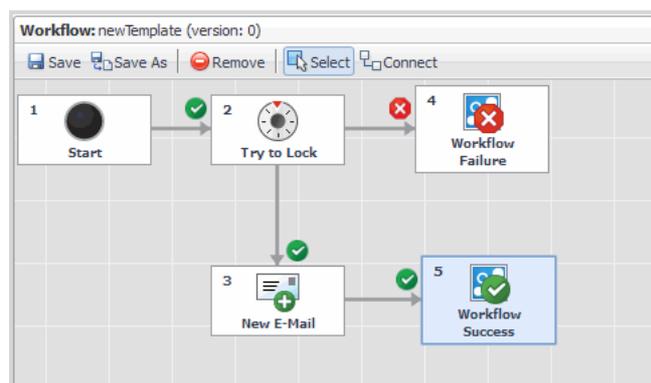
Designing Branched Workflows

You can design both single-threaded and branched workflows. In single-threaded workflows, actions are executed one-by-one in a defined order. Each action has a single incoming and outgoing link.

In branched workflows, actions have two or more outgoing links. The execution flow of the branched workflows depends on the execution result of the actions.

TIP: Consider a workflow that creates a backup copy of a virtual machine. Before copying the VM's data, the VM needs to be shut down. When implementing this business logic in a workflow, you need to check the execution result of the *ShutVM* action before starting backup. If the *ShutVM* action has finished successfully, then the workflow starts to copy data. If the *ShutVM* action has failed, then the workflow does not create a copy and sends a notification to an administrator.

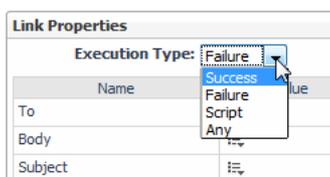
Figure 9. An example of a branched workflow.



After you have made the outgoing connections, you need to assign a condition to each link.

To assign conditions to links:

- 1 Switch to Select mode by clicking Select on the toolbar.
- 2 Select the link that you want to change.
- 3 Select its type on the Link Properties pane.



The link type is indicated by an icon near the incoming link.

The following conditions are supported:

- Success - follow the link if the previous action executed successfully.

- Failure - follow the link if the previous action failed.
 - Script - specify your own condition in Javascript.
- i** | **NOTE:** Selecting Script enables the Edit Script button on the Link Properties pane. Click this button to create a script in the Edit Script window.
- Any - follow the link regardless of the previous action's execution result.

There are a few restrictions for linking:

- The Success condition is automatically applied to the first link leading to an action.
- The same condition cannot be applied to several links that lead to the same action.
- The Any condition can be applied only if there is a single link between actions. If an action has more than one outgoing link, the Any condition cannot be applied to any of these links.

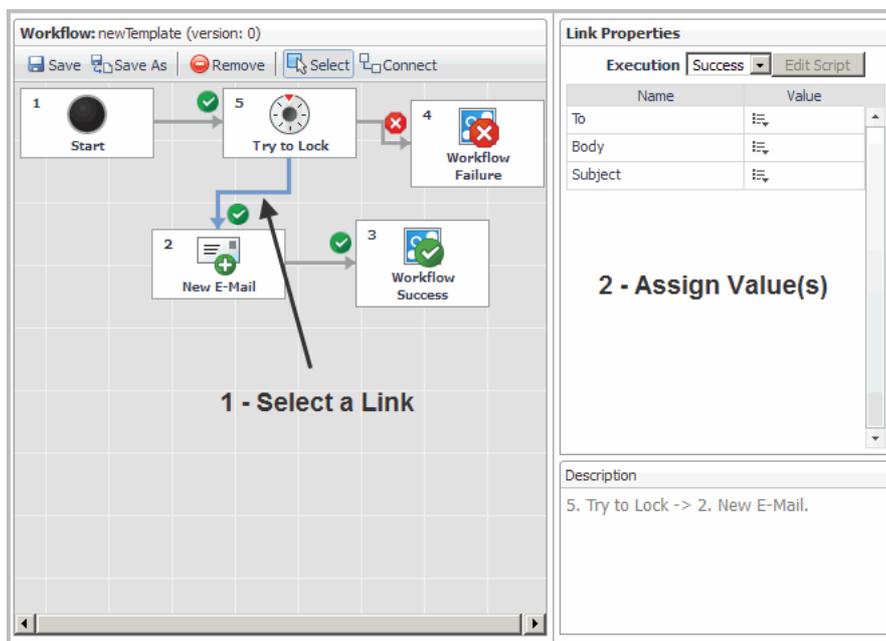
Assigning Values to Action Links

After you have connected actions, you can assign values to the incoming action links. For example, in a workflow that contains the StartVM action, you need to specify the name of a virtual machine to be started.

To view the action parameters:

- Select the action's incoming link.

Figure 10. The parameters appear on the Link Properties View pane, located to the right of the Workspace.



To set the initial link properties:

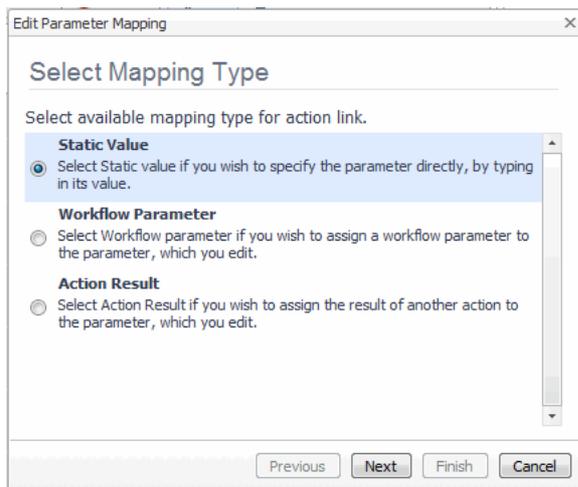
- 1 Switch to Select mode by clicking Select on the toolbar.
- 2 Select the link that leads to an action for which you want to customize the parameters. The link's properties appear in the Link Properties View.

i **TIP:** When designing branched workflows you can assign a specific value to each link that leads to an action. Imagine a workflow that notifies the system administrator about the action execution result. To design such a workflow, draw Success and Failure links to the New Email action. Then assign a “success” message to the Success link; assign a “warning” message to the Failure link.

- 3 Click the property that you want to customize.
- 4 The Parameter Mapping Wizard opens. Follow the steps of the wizard to assign values to action properties.

Parameter Mapping Wizard

Figure 11. On the Select Mapping Type page of the Parameter Mapping Wizard, select the mapping type for the link.

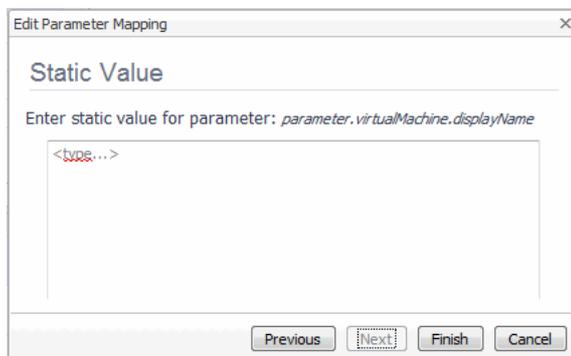


There are three options:

- To set a **Static Value** for a parameter:
- To set a **Global Parameter**:
- To set an **Action Result**:

To set a Static Value for a parameter:

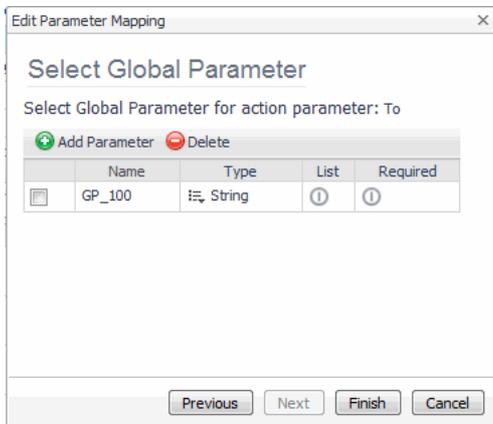
- 1 On the Select Mapping Type page, select **Static Value**.
- 2 Click **Next**.
- 3 On the Static Value page, type a value for the parameter in the box.



- 4 Click **Finish**.

To set a Global Parameter:

- 1 On the Select Mapping Type page, select **Workflow Parameter**.
- 2 Click **Next**.
- 3 On the Select Global Parameter page, select, add, or modify a global parameter,



You can modify the following options of a global parameter:

- **Type:** select by clicking the `Type` cell.
- **List:** select if the parameter is a list of values (for example, a list of VM names). If the parameter is a single value, do not select List.
- **Required:** if the business logic of the workflow you design requires that this parameter must always be set before the workflow can be executed, select Required. Users will not be able to run the workflow without specifying the value of the Required parameters.

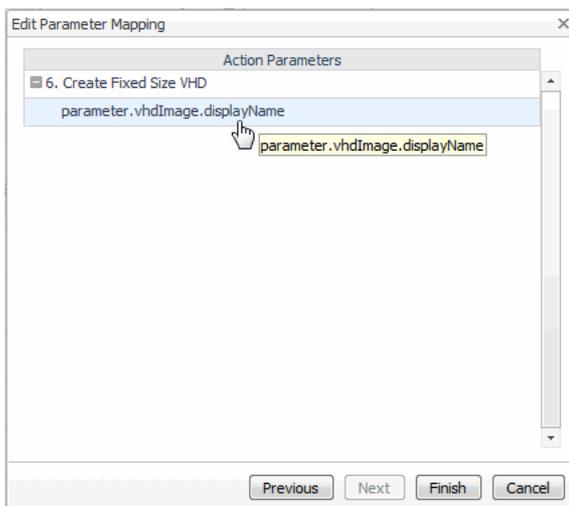
It may be convenient to quickly reassign various global parameters. You can do so by adding several global parameters to the list.

For more information, see [Using Global Parameters](#) on page 21.

- 4 When you've finished, click **Finish**.

To set an Action Result:

- 1 On the Select Mapping Type page, select **Action Result**.
- 2 Click **Next**.
- 3 On the Action Parameters page, select an action.



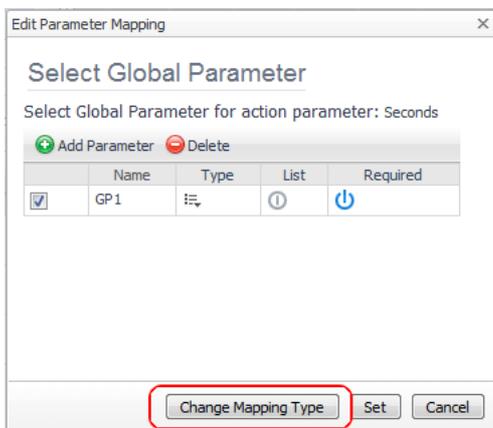
- 4 Click Finish.

Editing Link Parameters

You can edit link parameters that you have previously configured.

To change the type of a link parameter:

- 1 Switch to Select mode by clicking Select on the toolbar.
- 2 Select the link that leads to an action for which you want to customize parameters. The link's properties appear in the Link Properties View.
- 3 Click the property that you want to customize.
The Edit Parameter Mapping window opens.
- 4 Click Change Mapping Type.



- 5 Follow the instructions of the [Parameter Mapping Wizard](#) that opens.

Using Global Parameters

Before you can run a workflow, you have to assign values to its parameters. For example, if you need to start a virtual machine with the StartVM action, you need to specify the name of the virtual machine to start.

You can assign values explicitly or use global parameters. Global parameters are placeholders for values used by actions. It is recommended to use global parameters for the most common values required by many workflows. For example, use a global parameter to specify a virtual machine name, as this value is required by every action that operates on a virtual machine.

Global parameters allow you to quickly update multiple actions. When you modify the value of a global parameter, it is automatically applied to all actions that use that global parameter.

i | **IMPORTANT:** You will be asked to specify the values for the global parameters when you run a workflow or task. For more information, see [Creating New Tasks](#) on page 25.

Creating Global Parameters

To create a global parameters:

- 1 Open the Workflow Studio.
- 2 Switch to Select mode.
- 3 Select the Start action on the workflow.

Figure 12. The global parameters appear on the Properties pane.

Global Parameters (Input)				
Add Parameter Delete				
	Name	Type	List	Required
<input type="checkbox"/>	VMName	HPVServer	<input type="radio"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	VMStorage	HPVirtualFolder	<input type="radio"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Message	String	<input checked="" type="radio"/>	<input type="checkbox"/>

- 4 Click Add Parameter on the toolbar.
The new global parameter appears in the list with the automatically generated name.
- 5 Click the name of the new global parameter to modify it.
- 6 Click the type of the new global parameter to modify it.
- 7 Select Required if you want the parameter to become obligatory. Users cannot execute workflows unless all required parameters are set.
- 8 Select List if the global parameter is a list of values (for example, a list of strings).

Setting Action Execution Options

You can specify the number of attempts and execution timeout for each action in your workflow. The following options are available:

- Max execution attempts: specifies how many times the vFoglight Cartridge for Automation will attempt to execute an action before Workflow Failure is returned. The default value is 1.
- Execution Rate: specifies the timeout (in seconds) for the action execution. After this timeout expires, Workflow Failure is returned. The default value is 60.

To modify the action execution parameters:

- 1 Switch to Select mode.
- 2 Select an action.
- 3 Customize the execution options that are displayed on the Properties pane.

Action Properties - Sleep

2. **Sleep**

Max execution attempts:

Execution Rate, s :

Executing Workflows

In order to execute the business logic of a workflow, you must:

- 1 Create a task from a workflow.
- 2 Assign values to the workflow parameters.
- 3 Configure scheduling and running options.

To create a new task and configure its execution options:

- 1 On the Automation dashboard, click the Workflow Management tab.

- 2 Select a workflow to run from the list of available workflows.
- 3 Click Run on the toolbar.

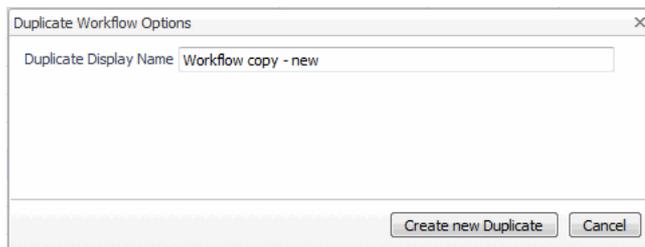
The [Run Workflow Wizard - Step 1](#) opens and guides you through the operations required to run a workflow.

Duplicating Workflows

If you need to create a workflow similar to an existing workflow, you can duplicate (clone) the existing workflow instead of creating an entirely new one. Then you can modify the new workflow according to your needs.

To duplicate a workflow:

- 1 On the Automation dashboard, click the Workflow Management tab.
- 2 Select the workflow to duplicate.
- 3 On the toolbar, click Duplicate.
- 4 In the **Duplicate Workflow Options** dialog box, specify the name for the duplicated workflow.



- 5 Click Create new **Duplicate**.
The cloned workflow appears in the Workflows list.

Exporting and Importing Workflows

You can save a copy of a workflow by exporting it. You can then reuse the workflow by importing it. Workflows are saved as XML files.

To export a workflow:

- 1 On the Automation dashboard, click the Workflow Management tab.
- 2 Select the workflow to export.
- 3 Click **Export on the** toolbar.
- 4 Depending on the Web browser you are using, you are asked to either open an XML file or save it. Choose the option to save the file, then navigate to the destination folder in the standard operating system dialog box.

i | **NOTE:** If you select several workflows to export, the result will be saved as a single XML file.

To import a workflow or a set of workflows:

- 1 On the Automation dashboard, click the Workflow Management tab.
- 2 On the toolbar, click Import.
- 3 In the dialog box that opens, click **Browse**.
- 4 Navigate to an XML file that contains an exported workflow.

- 5 Click **Apply**. The selected workflow is installed.

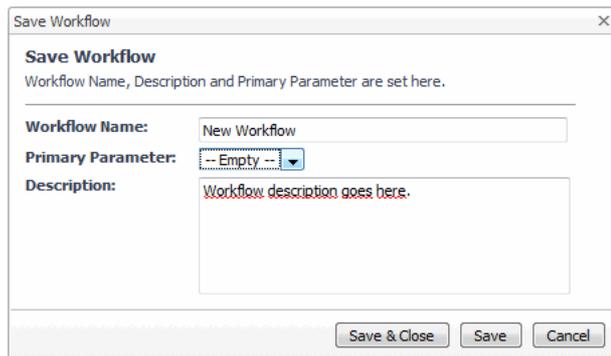
i | **NOTE:** If a workflow with the same name already exists, you are prompted to assign another name to the workflow that you are trying to import.

Saving Workflows

To save a workflow in the Workflow Studio:

- 1 Click **Save** on the Workflow Studio toolbar, or to save your workflow under another name, click **Save As**.

Figure 13. The Save Workflow dialog box opens.



- 2 In the **Workflow Name** box, type a name for your workflow.
- 3 From the **Primary parameter** list, select a primary resource for your workflow. The primary resource is the one to which you will be able to assign two or more resources.

i | **TIP:** Imagine a workflow that stops all VMs running on a host and then shuts down the host. If you select the VM as a primary parameter, you will be able to assign to it not a single VM, but the list of VMs that you want to shut down. However, there may be only one parameter in a workflow to which you can assign a list of resources. This parameter is called the Primary Parameter.

- 4 **Optional:** Add a brief description of the current workflow in the **Description** box.
- 5 Click **Save**. Your workflow is saved. You can make additional changes to a workflow if required.

Alternatively, click **Save and Close** to save the current workflow and close the Workflow Studio, or click **Cancel** to close the Save Workflow dialog box without saving the current workflow.

Managing Tasks

You can perform basic task operations from the Task Management toolbar, located above the Tasks pane.

- [Creating New Tasks](#)
- [Duplicating Tasks](#)
- [Re-running Tasks](#)
- [Stopping Tasks](#)
- **Deleting Tasks** — Click **Delete** on the toolbar.
- **Searching for a Task** — Type the task name in the Search field and click Search.

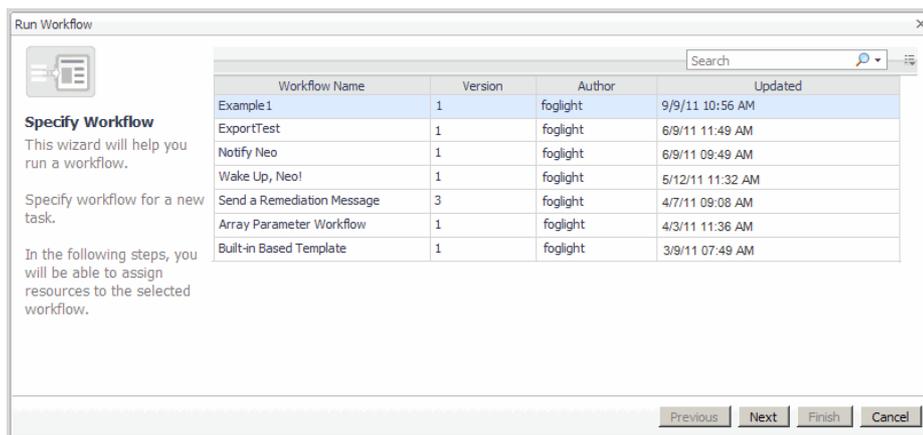
Creating New Tasks

To create a new task:

- 1 On the Automation dashboard, click the **Task Management** tab.
- 2 On the Task Management tab click New.
- 3 The **Run Workflow Wizard** opens. Follow the steps of the wizard to run a workflow.

Run Workflow Wizard - Step 1

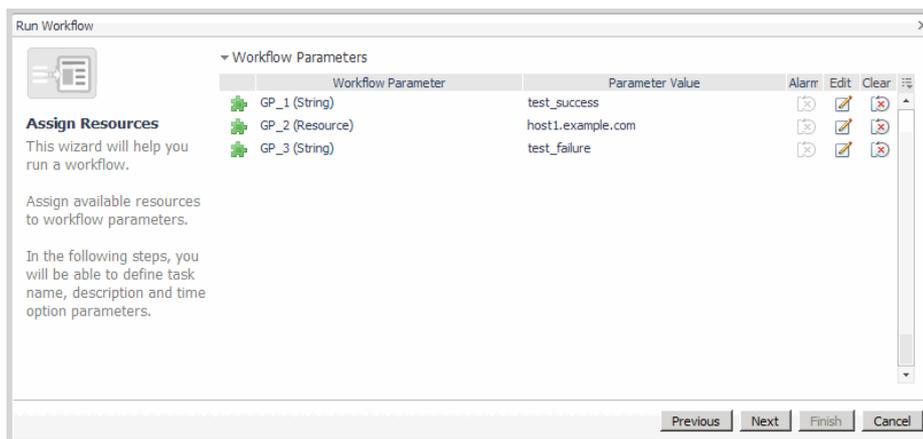
- 1 On the first step of the Run Workflow wizard, select a workflow to create an executable task.



- 2 Click Next.

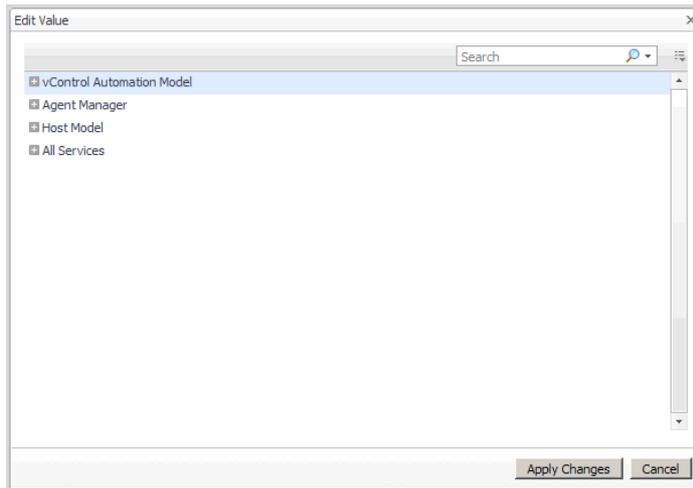
Run Workflow Wizard - Step 2

- 1 On the second step of the Run Workflow wizard, assign values to the workflow parameters.



- a To assign or change the parameter value, click the icon in the Edit column for the parameter.
Depending on the parameter type, you must either type in its value or assign a resource to it in the **Edit Value** dialog box that opens.

Figure 14. To assign a resource, locate it in the resource tree.

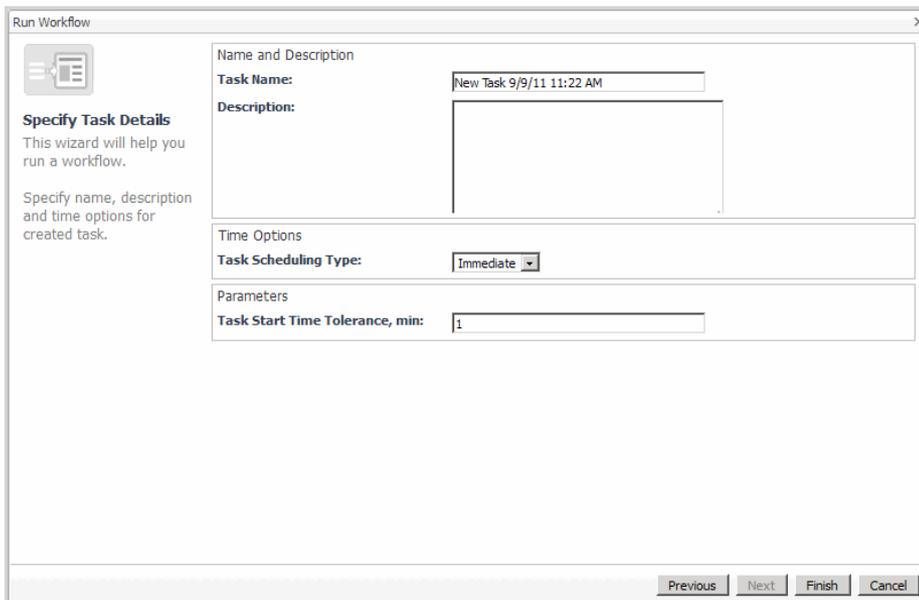


Click **Apply Changes** to close the Edit Value dialog box.

- b To clear an assigned value, click Clear.
- 2 After you have assigned all parameters, click Next.

Run Workflow Wizard - Step 3

- 1 On the third step of the Run Workflow Wizard, specify the task description and running options.



- Task Name: specify a custom name for a task.
- Description: type in a custom description for a task that you create.
- Task Scheduling Type: specify the scheduling parameters. The following scheduling options are available: Immediate, Single, Hourly, Daily, Weekly, Monthly, and Annually.
- Task Start Time Tolerance, min: specify the time during which the Workflow Server will be trying to add a workflow to the execution queue. Typically Workflow Servers limit the number of simultaneously executed workflows. If the limit has already been reached, the Workflow Server tries to add a workflow to the execution queue for the duration of time specified by this option.

- 2 Click **Finish**.

The task you have just created appears in the Task List on the Task Management tab of the Automation dashboard.

To check the execution status, click the **State** column of the Task List on the Task Management tab. The task details appear in the details pane on the right-hand side. For more information, see [Task Management View](#) on page 10.

Editing Tasks

You can modify a task's name and reconfigure its execution and scheduling options.

To edit a task:

- 1 On the Task Management tab, select the task that you want to edit from the Task List.
- 2 Click Edit on the toolbar.
- 3 Follow the instructions of the Run Workflow Wizard, beginning at step 2. For more information, see [Run Workflow Wizard - Step 2](#) on page 25.

i | **NOTE:** You can edit only the tasks that are not scheduled for immediate execution. When editing a task, you can change the task parameters and the schedule. Once you modify the task schedule the task is executed with the new parameters.

Duplicating Tasks

You can quickly create a copy of a task by duplicating it.

To duplicate a task:

- 1 From the Task List on the Task Management tab, select the task that you want to duplicate.
- 2 Click Duplicate on the toolbar.
- 3 Specify the new name of a task. You will not be able to proceed until you specify a new name.
- 4 Click **Duplicate**.

The duplicated task appears in the Task List on the Task Management tab.

Re-running Tasks

To re-run a task:

- 1 From the Task List on the Task Management tab, select the task that you want to re-run.
- 2 Click Run Again on the toolbar.

The task is executed again.

i | **NOTE:** You cannot re-run Active or Overdue tasks. You can re-run only tasks that are already finished (Failed, Completed, or Stopped status) or scheduled for immediate execution.

Stopping Tasks

To stop a task:

- 1 From the Task List on the Task Management tab, select the task that you want to stop.
- 2 Click Stop on the toolbar.

The task execution stops.

NOTE: You can stop only Active and Scheduled tasks. The Stop button is disabled for other types of tasks.

Managing Remediation Mapping

Remediation Mapping helps users prevent system failures and ensures continuity of applications and services in the virtual environment. With Remediation Mapping, users can react to system alarms and warnings by running predefined workflows that eliminate the risk of system failure.

For example, consider the case where a virtual machine that is monitored by Foglight for Automation runs short of system resources (for example, disk space or RAM). An alarm appears in Foglight for Automation. Using Remediation Mapping, you can execute a workflow to release the resources required for normal operation of a virtual machine.

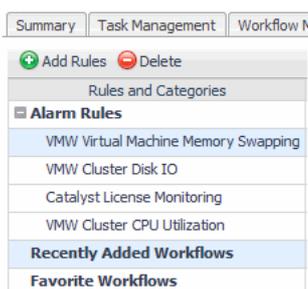
Remediation Mapping Rules View

The Remediation management controls are located on the Remediation Mapping tab of the Automation window.

To view the remediation mapping rules:

- 1 On the navigation panel, under Homes, click Automation.
- 2 On the Automation dashboard, click the Remediation Mapping tab.
- 3 Expand the Rules group on the Rules and Categories pane.

Figure 15. The list of previously added rules appears.



- 4 Select a rule from the list. The workflows that are assigned to the selected rule appear on the Workflows pane.

Creating Rules

To set remediation mapping, you must first create a rule and assign workflows to it.

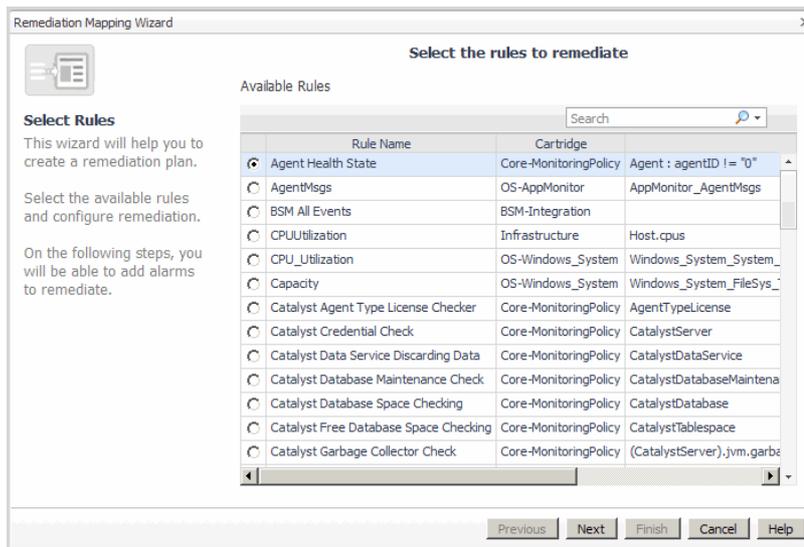
To create a rule:

- On the Remediation Management Rules and Categories toolbar, click Add Rules.
The Remediation Mapping Wizard opens. Follow its instructions to complete remediation mapping.

Remediation Mapping Wizard - Step 1

- 1 Select the rule to remediate.

Figure 16. The rules are listed in the wizard window.



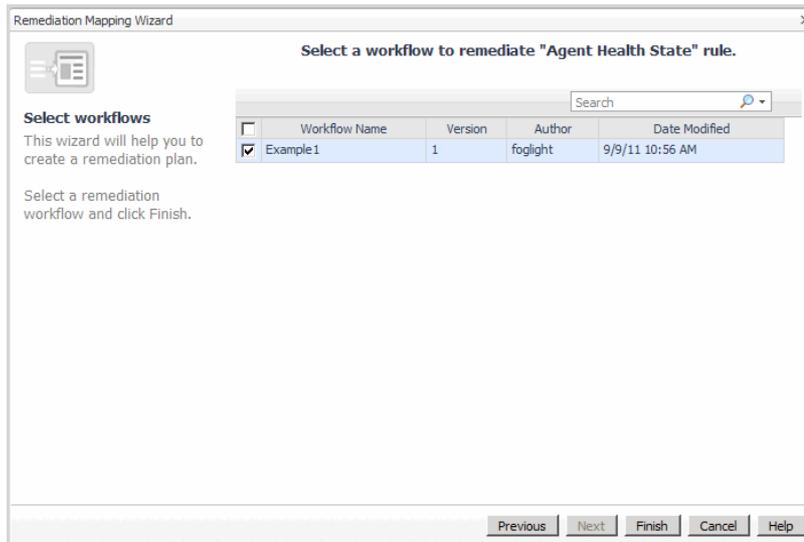
TIP: Use Search to quickly find a remediation rule by name.

- 2 Click Next.

Remediation Mapping Wizard - Step 2

- 1 Select one or more workflows to remediate the rule.

Figure 17. The workflows are listed in the wizard window.



- 2 Click Finish.

The new remediation rule appears on the Rules and Categories pane, and the workflow used by the rule appears in the All Remediation Workflows list.

Adding Workflows to a Rule

After you have created a remediation rule, you can add workflows to it.

To add a workflow to a rule:

- 1 On the Rules and Categories pane of the Remediation Mapping tab, select the rule to which you want to add a workflow.
- 2 Click Add Workflow on the toolbar. The Select Workflow dialog box opens, containing the list of the available workflows.
- 3 Select the check box for the workflow you want to add.
- 4 Click OK.

The workflow appears in the Remediation Workflows list.

Configuring Binding

After you have selected a workflow to remediate an alarm, you can configure binding by assigning the properties of the alarm that you remediate to the parameters of the workflow that runs when the alarm is fired.

For example, an alarm fires when a virtual machine is running out of memory. Using binding, you can transfer the virtual machine as a whole, one of its properties (for example, the memory size), the property of the alarm (for example, the time stamp), or a static value.

To configure binding:

- 1 Click the Binding field of the selected workflow on the Workflows pane of the Remediation Mapping view.

Remediation workflows for "HPV Server Disk IO"

Workflow Name	Version	Author	Rule Name	Date Modified	Binding
Hyper-V Create Fixed Disk	1	foglight	HPV Server Disk IO	19.10.10 11:52	[server,storage,name,si

The Remediation Workflow Parameter Mapping dialog box opens, listing the workflow parameters that you can bind to the alarm properties and objects.

- 2 Click the **Mapping** field.

Remediation Workflow Parameter Mapping

Workflow parameters mapping

Preview parameters before remediation

"Hyper-V Create Fixed Disk" workflow parameters

Name	Mapping	Required
server		true
storage		true
name		true
size		true

You are prompted to specify the binding type. Depending on the property type, different binding types are available:

- Bind to a property of the rule's alarm: allows you to assign a parameter of the fired alarm to the workflow property (for example, assign the alarm time stamp).
 - Bind to a property of the rule's scope object: allows you to assign a parameter of the scope object to the workflow property (for example, assign the name of a VM).
 - Bind to the scope object: allows you to assign a scope object as a whole to the workflow property (for example, assign the virtual machine as a topology object).
 - Bind to a static value: allows you to assign a static value to the workflow property (for example, a string, boolean value, integer).
- 3 **Optional**—Select the Preview Parameters Before Remediation check box if you want to be prompted to confirm or update the remediation binding each time before the workflow runs.

Adding Workflows to Favorites

You can add the workflows that you use frequently for remediation to the favorites list.

To add a workflow to Favorites:

- 1 On the Remediation Workflows Pane, select the workflow that you want to add to favorites.
- 2 Click Add to Favorites on the toolbar.

The added workflow appears in the Favorite Workflows list on the Rules and Categories pane.

Deleting Workflows From a Rule

To delete a workflow from a remediation rule:

- 1 Select one or more workflows on the Remediation Workflows pane of the Remediation Mapping view.
- 2 Click Delete on the toolbar.

- 3 Confirm the deletion by clicking **Remove workflow(s)**.

Deleting Rules From Remediation Mapping

To delete a rule from the remediation mapping:

- 1 Select a rule on the Rules and Categories pane of the Remediation Mapping view.
- 2 Click Delete on the toolbar.

i | **NOTE:** Deleting a rule also removes any associated workflows from the Remediation Workflows list.

- 3 Confirm the deletion by clicking **Remove workflow(s)**.

Pre-installed ActionPacks

This chapter provides an overview of the ActionPacks that are included by default with the Foglight for Automation.

ActionPack for E-mail Processing

This ActionPack enables sending ([New E-mail Action](#)) and receiving ([Get E-mails Action](#)) e-mail messages.

New E-mail Action

This action creates and sends a new e-mail message.

Pre-conditions:

- E-mail processing setup must be completed. Navigate to Configuration > Settings and specify the From E-mail Address, SMTP Host, SMTP Port, SMTP User Name, SMTP Password parameters.

Table 1. New E-mail Action Input Parameters

Name	Type	Description
To	String	E-mail address
Subject	String	Subject of the e-mail
Body	String	Body of the e-mail

Get E-mails Action

This action logs in to a remote POP3 server and retrieves a given number (limit) of e-mail messages.

Pre-conditions:

- None

Table 2. Get E-mails Action Input Parameters

Name	Type	Description
Host	String	IP address of POP3 host.
username	String	Username
password	String	Password
waitForMessages	Boolean	Flag that causes the action to wait for a message.
deleteReceived	Boolean	If true, the method will delete received messages on server.
limit	Integer	Expected number of received e-mails.

Table 3. Get E-mails Action Output Parameters

Name	Type	Description
from	String	E-mail's "From" text
subject	String	E-mail's "Subject" text
Body	String	E-mail's "Body" text
receivedCount	Integer	Number of received e-mails
leftCount	Integer	Number of e-mails remaining in the mailbox

ActionPack for Workflow Control

This ActionPack contains actions for workflow construction, and actions to manage workflow execution.

Workflow Failure Action

This action finishes workflow execution with the "Failed" state. The Workflow Failure action does not have input or output parameters.

Workflow Success Action

This action finishes workflow execution with the "Succeeded" state. The Workflow Success action does not have input or output parameters.

Run Workflow Action

This action launches the specified workflow, passing the input parameters in a JSON string. Output parameters are not supported.

Pre-conditions:

- The passed workflow parameters must be in a JSON string

Table 4. Run Workflow ActionInput Parameters

Name	Type	Description
Workflow GUID	String	Globally Unique Identifier (GUID) of the workflow.
Workflow parameters	String	Target workflow parameters. This string should contain a JSON representation of mappings for the target workflow parameters.

i | **NOTE:** If the actual parameter string is built inside some workflow action (and does not come from a global parameter), it must not contain any references to other actions. This is due to the workflow engine limitation.

The string should be (preferably) enveloped in `{}`; all the text after the last `}` is ignored.

It is possible to use Resource references when providing workflow parameter mappings.

Example:

```
{ GP_1: "test", VM: "action2.VM", test: ["1", "2", "3"], VM2: "GP.VM",  
"VM3": "ou=554958AD25D2A7A70663B682C438DBD4,
```

```
ou=01D094B466F17C46642697364186E9B4,  
ou=307BE766E09F05EDD43C81C8CF4CD4B6,ou=172.16.41.16,  
ou=Discovered VMware Infrastructure,ou=vfabrix,dc=vfi,dc=local" }
```

Linked Workflow Action

This action allows to create linked workflows. In other words, you can create a workflow that launches another workflow.

How To Use

After you have added the Linked Workflow action to the Workspace and linked it to other action(s), do the following:

- 1 Click Click to set a workflow on the Linked Workflow action. The Select workflow dialog box opens with a list of available workflows.
- 2 Select the workflow that you want to link. Click OK.
- 3 Click the link that leads to the Linked Workflow action. The Links pane lists input parameters for the linked workflow.
- 4 Type in the input parameters of the linked workflow.

Sleep Action

This action pauses the workflow execution for the specified number of seconds.

Pre-conditions:

- None

Table 5. Sleep Action Input Parameters

Name	Type	Description
Pause for	Long integer	Time in seconds, during which the workflow will be paused

ActionPack for Resource Locking

This ActionPack provides the ability to lock resources (hosts, virtual machines, snapshots, and so on) so that other actions cannot update, delete, or move those locked resources.

Lock Action

This action tries to obtain a lock for a resource (waits infinitely).

Pre-conditions:

- None

Table 6. Lock Action Input Parameters

Name	Type	Description
resource	vfiTop resource	Resource to be locked

Table 7. Lock Action Output Parameters

Name	Type	Description
lockId	Long	Lock ID

Lock with Timeout Action

This action tries to obtain a lock for a resource for the specified time limit.

Pre-conditions:

- None

Table 8. Lock with Timeout Action Input Parameters

Name	Type	Description
resource	vfiTop resource	Resource to be locked
timeout	Long	Amount of time in seconds during which the action will try to obtain a lock

Table 9. Lock with Timeout Action Output Parameters

Name	Type	Description
lockId	Long	Lock ID

Try To Lock Action

This action makes a single attempt to obtain a lock on the named resource.

Pre-conditions:

- None

Table 10. Try to Lock Action Input Parameters

Name	Type	Description
resource	vfiTop resource	Resource to be locked

Table 11. Try to Lock Action Output Parameters

Name	Type	Description
lockId	Long	Lock ID

Unlock Action

This action unlocks a resource lock.

Pre-conditions:

- None

Table 12. Unlock Action Input Parameters

Name	Type	Description
lockId	Long	Lock identifier. You can take it from the output parameter of a lock action

Unlock All Action

This action unlocks all current workflow locks. Linked workflow locks are not processed. This action does not have input or output parameters.

Unlock Resource Action

This action looks for a lock that corresponds to the specified resource and unlocks it.

Pre-conditions:

- None

Table 13. Unlock Resource Action Input Parameters

Name	Type	Description
resource	vfiTop resource	Resource to be unlocked

We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation™.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece—you—to the community, to the new Quest.

Contacting Quest

For sales or other inquiries, visit <https://www.quest.com/company/contact-us.aspx> or call +1-949-754-8000.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.
- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
- Chat with support engineers online.
- View services to assist you with your product.