

HP Operations Orchestration

for the Windows and Linux operating systems

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VMware vCloud Integration Guide

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Overview of VMware vCloud integration

With this integration, administrators can build HP Operations Orchestration (OO) flows that are integrated into the VMware vCloud Director.

The VMware vCloud integration uses the RESTful vCloud v1.0 API to integrate with OO. To use this integration successfully, you should have administrator-level knowledge of vCloud Service Director.

This document explains how this integration has been implemented, and how the integration's operations and flows communicate between OO and the vCloud API.

Use cases and scenarios

The following are the major use cases for the VMware vCloud integration, and the operations and flows that you can use to implement them.

1. Virtual datacenter (vDC) management:
 - Create Organization
 - Modify Organization
 - Delete Organization
 - Create Organization vDC
 - Delete Organization vDC
 - Create Direct Organization Network
 - Delete Organization Network
1. vApp lifecycle management:
 - Upload OVF as vApp Template
 - Download vApp Template as OVF
 - Import Virtual Machine as vApp
 - Import Virtual Machine as vApp Template
 - Create Template From vApp
 - Deploy vApp From Template
 - Delete vApp
 - Delete vApp Template
2. Basic self-help operations:
 - Start vApp
 - Stop vApp
 - Suspend vApp
 - Get vApp State
 - Get VM State
 - Set vApp Lease Settings
 - Edit VM Network

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Or click the **New users - please register** link on the HP Passport login page.

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1. On the left-hand side, click **Operations Orchestration Content Packs**.
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3. Enter your user ID and Password to access to continue.
4. Click **HP Operations Orchestration 9.00**.
5. Search for HP Operations Orchestration Content Pack 7

Installation and configuration instructions

The VMware vCloud integration does not require any special installation and configuration. The only requirement is that the system that has the RSJRAS service running on it can access the vCloud server. To verify that the vCloud API is accessible, go to the following Web page:

<http://<vCloudServer>/api/v1.0/schema/master.xsd>

The displayed xml should look something like this:

```
<xs:schema targetNamespace="http://www.vmware.com/vcloud/v1"
elementFormDefault="qualified" version="1.0">
<xs:include schemaLocation="http://<vCloudServer>/api/v1.0/schema/vcloud.xsd"/>
<xs:include schemaLocation="http://<vCloudServer>/api/v1.0/schema/admin.xsd"/>
</xs:schema>
```

Versions

Operations Orchestration Version	vCloud Service Director Version
Content Pack 7	1.0, 1.5

Architecture

The vCloud API communicates with the vCloud server over HTTPS using RESTful conventions. GET requests are used to retrieve current representations of vCloud objects. POST and PUT requests are used to create or modify vCloud objects. DELETE requests are typically used to delete vCloud objects. The vCloud objects are described using XML as defined in the VMware vCloud API v1.0 which you can view on the following Web page:

<http://communities.vmware.com/community/developer/forums/vcloudapi>

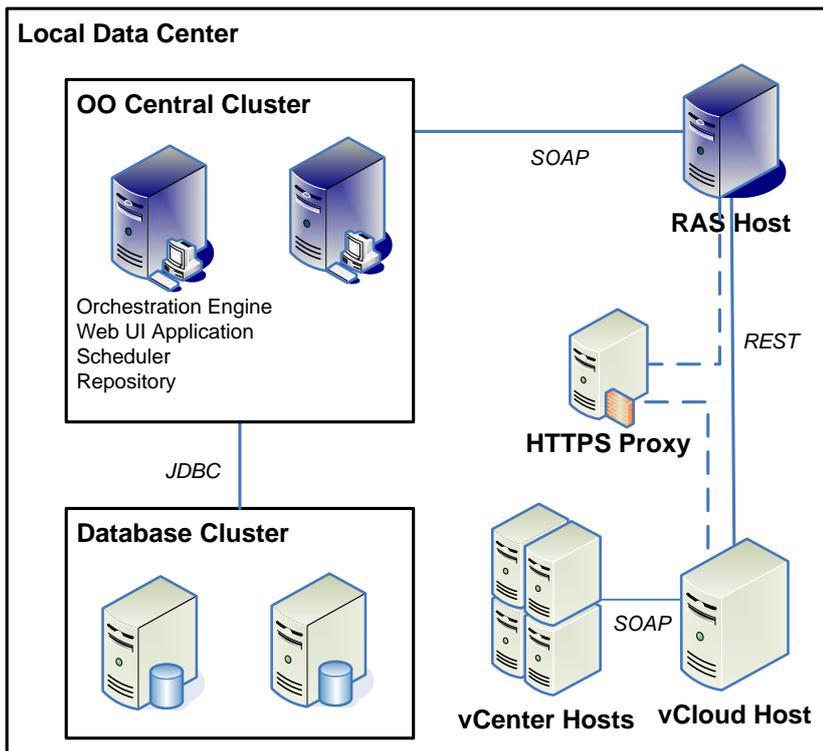


Figure 1 - VMware vCloud architecture

VMware vCloud terminology

The following terms are used in the VMware vCloud integration guide's descriptions of its OO operations and flows.

Catalog

Catalogs are used to organize vApp templates and media images (ISO or FLOPPY images) in an organization. The vApp templates and media images of an organization are stored in an organization vDC, but can be referenced by a catalog.

External network

This is the network equivalent of a provider vDC. Organization networks can connect to external networks to communicate with networks outside of the vCloud environment.

Organization

Organizations provide resources to a group of users and set policies that determine how users can consume those resources. Organizations enable multi-tenancy in a vCloud environment.

Organization network

This is the network equivalent of an organization vDC. Organization networks:

- Are networks to which vApps can actually connect
- Can be internal and only available to vApps in the organization but across organization vDCs
- Can be attached to external networks for communication with networks outside of the vCloud environment

Organization Virtual Datacenter (vDC)

CPU, memory, and storage resources are allocated to organizations using organization vDCs. An organization can have multiple vDCs. The resources of an organization vDC are partitioned from those of a provider vDC.

OVF

Open Virtualization Format. This is an open and portable format for the packaging and distribution of one or more virtual machines. This integration uses the OVF format to import and export vApp templates.

Provider Virtual Datacenter (Provider vDC)

A provider vDC manages and provides the CPU, memory, and storage resources of a vCenter resource pool to organization vDCs.

Runtime and storage leases

Runtime and storage leases are defined policies that automatically shut down running vApps after a specified runtime. Once the vApp is shut down, it can be automatically moved to an expired items location or deleted after the storage lease has expired. Templates can also be automatically moved to an expired items location or deleted if the template storage lease is expired. The default runtime and storage lease policies are defined per organization.

vApp

A collection of one or more virtual machines defined by Open Virtualization Format (OVF) to specify and encapsulate all of the components of a multi-tier application.

vCenter

A management server for a collection of VMware vSphere (ESX/ESXi) hypervisor hosts.

VMware vCloud integration operation and flow infrastructure

The VMware vCloud integration includes the following operations and flows in the OO Studio Library/Integrations/VMware/VMware vCloud/ folder.

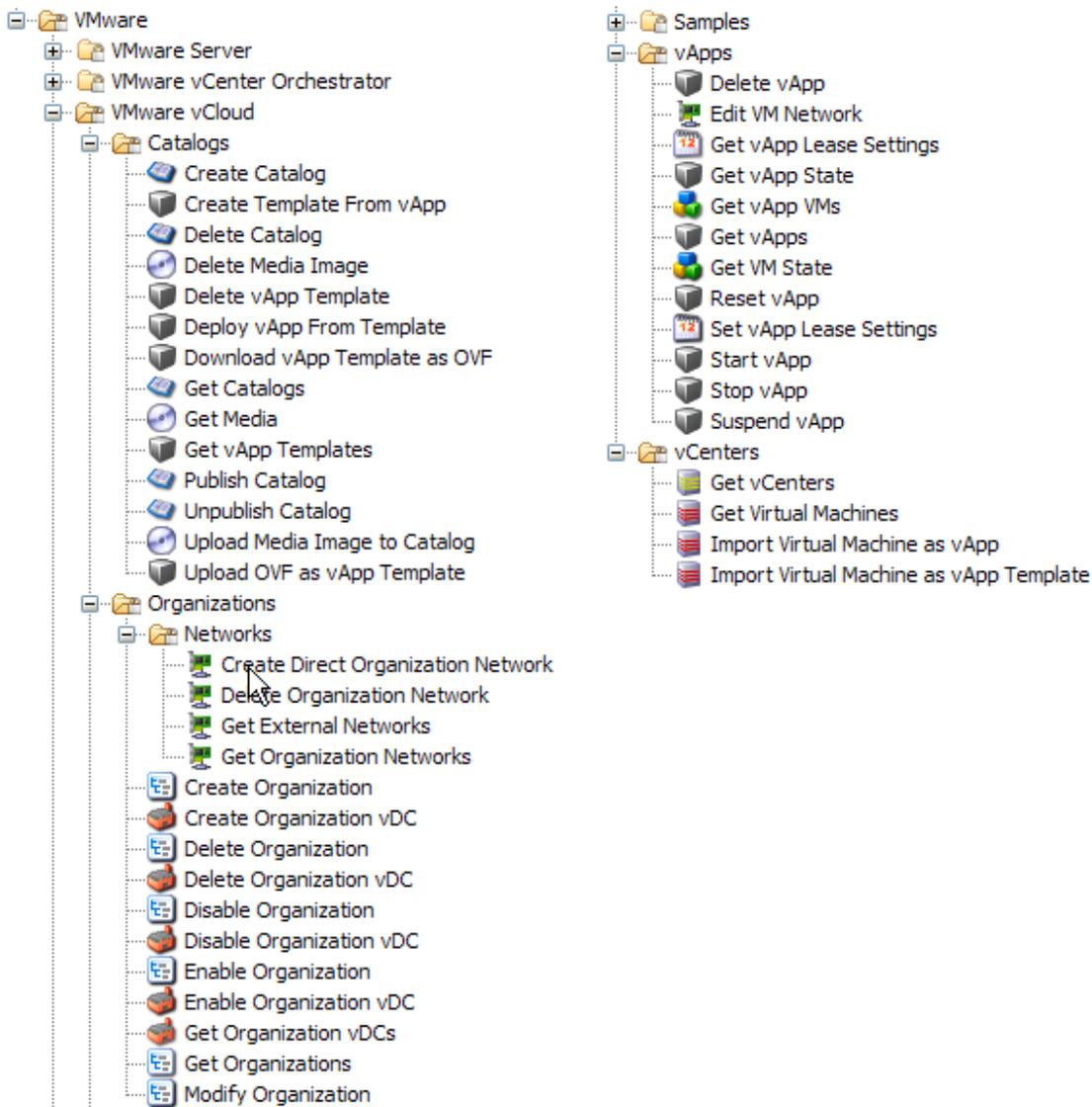


Figure 2 - VMware vCloud operation and flow infrastructure

Common inputs in the integration

OO flows and operations use inputs to specify how they obtain the data they need and when the data is obtained. The following inputs are used consistently throughout the VMware vCloud integration's operations and flows.

host

The vCloud host server. You can specify the host by using its IP address (for example, **10.2.255.116**) or its DNS name (for example, **www.vcloudhost.com**).

port

The HTTPS port to connect to the vCloud REST API. The default port is **443**.

username

The username to use to log on to the vCloud host. You must use the format `username@organization`. If you do not specify an organization in `@organization`, the operation uses the default organization of **system**.

password

The password associated with the value you specify for the **username** input.

proxyHost

The HTTPS proxy server hostname or IP address to use to connect to the vCloud REST API (if needed).

proxyPort

The IP port number for the proxy server. You must specify a value for this input if you specify a value for the **proxyHost** input.

proxyUsername

The username to use for authentication with the HTTPS proxy server (if needed). You must specify a value for this input if you specify values for both the **proxyHost** and **proxyPassword** inputs.

proxyPassword

The password associated with the value you specify for the **proxyUsername** input.

Operation and flow specifics

This section describes the VMware vCloud integration's flows and operations, including any operation- or flow-specific inputs. The flows and operations are grouped by their basic functionality:

- Catalogs
- Organizations
- vApps
- vCenters

Catalogs

Create Catalog

The **Create Catalog** operation creates a new catalog for an organization. Catalogs help you organize vApp templates and removable media images within your organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization in which to create the new catalog.

catalog

The name of the new catalog to create.

description

A description of the new catalog.

isPublished

Specifies whether the catalog is published. Published catalogs can be used by other organizations. The valid values are **true** and **false**. If you specify a value of **true** for this input, the operation creates the catalog in a published state.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The organization must allow catalog publishing in order for you to publish a catalog. Use the **Modify Organization** operation to modify this policy.

Create Template From vApp

The **Create Template From vApp** operation creates a new vApp template from an existing vApp. All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the existing vApp and the vApp template to create.

orgVdc

The virtual datacenter of the existing vApp and vApp template to create.

vApp

The name of the existing vApp from which to make the new vApp template.

template

The name of new vApp template.

description

A description of the new vApp template.

catalog

The name of the catalog to which to add the new vApp template.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The existing vApp and the new template must be in the same organization vDC.

Delete Catalog

The **Delete Catalog** operation deletes an existing catalog from an organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization from which to delete the catalog.

catalog

The name of the catalog to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You cannot delete the specified catalog if it has any items associated with it.

Delete Media Image

The **Delete Media Image** operation deletes a media image from a virtual datacenter (vDC).

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization from which to delete the media image.

orgVdc

The virtual datacenter that contains the media image to delete.

mediaName

The name of the media image to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- Media images are CD/DVD (ISO) or floppy (FLOPPY) images that vApp virtual machines can use.
- You can organize media images in a catalog, but they are stored in a vDC.

Delete vApp Template

The **Delete vApp Template** operation deletes a vApp template from a virtual datacenter (vDC).

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization from which to delete the vApp template.

orgVdc

The virtual datacenter that contains the vApp template to delete.

template

The name of the vApp template to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- You can use vApp templates to create new preconfigured vApps.
- You can organize vApp templates in a catalog, but they are stored in a vDC.

Deploy vApp From Template

The **Deploy vApp From Template** operation creates a new vApp from a vApp template.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp template and the new vApp.

orgVdc

The virtual datacenter of the vApp template and the new vApp.

template

The name of vApp template to use to create the new vApp.

vApp

The name of the new vApp.

description

A description of the new vApp.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The new vApp is not attached to any organization network. Use the **Edit VM Network** operation to attach a VM network interface to an organization network.

Download vApp Template as OVF

The **Download vApp Template as OVF** operation downloads a vApp template from a virtual datacenter to the RAS as an OVF descriptor and a set of virtual machine disk (.vmdk) files.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization to which the vApp template to download belongs.

orgVdc

The virtual datacenter to which the vApp template to download belongs.

template

The name of the vApp template to download.

localPath

The local directory on the RAS to which the .ovf descriptor and associated .vmdk files are downloaded. This should be an empty directory.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Get Catalogs

The **Get Catalogs** operation retrieves a list of catalogs from an organization. You can also use this operation to search for a catalog in an organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization from which to retrieve or search for catalogs.

catalog

The name of the catalog to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all catalogs that contain the input value.

For example, if you have two catalogs named **Catalog One** and **Catalog Two** and you specify an input value of **one**, the search only returns **Catalog One**. If, however, you specify an input value of **catalog**, both **Catalog One** and **Catalog Two** are returned.

If you do not specify a value for this input, it returns all of the catalogs in the organization.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsCatalogs

A JSON (JavaScript Object Notation) array of catalog names. An array is an ordered collection of values.

Note: This operation returns the list of catalogs as a JSON array. Use the **Array Iterator** operation to iterate through the list.

Get Media

The **Get Media** operation retrieves a list of media images from a virtual datacenter. You can also use the operation to search for a media image in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization from which to retrieve or search for media images.

orgVdc

The virtual datacenter in which to search for media images.

mediaName

The name of the media image to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all media images that contain the input value

For example, if you have two media images named **Media Image One** and **Media Image Two** and you specify an input value of **one**, the search only returns **Media Image One**. If, however, you specify an input value of **media image**, both **Media Image One** and **Media Image Two** are returned.

If you do not specify a value for this input, it returns all of the media images in the virtual datacenter.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsMedia

A JSON (JavaScript Object Notation) array of media image names.

Note: This operation returns the list of media images as a JSON array. Use the **Array Iterator** operation to iterate through the list.

Get vApp Templates

The **Get vApp Templates** operation retrieves a list of vApp templates from a virtual datacenter. You can also use the operation to search for a vApp template in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization in which to search for vApp templates.

orgVdc

The virtual datacenter from which to search for vApp templates.

template

The name of the vApp template to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all vApp templates that contain the input value.

For example, if you have two vApp templates named **vApp Template One** and **vApp Template Two** and you specify an input value of **one**, the search only returns **vApp Template One**. If, however, you specify an input value of **template**, both **vApp Template One** and **vApp Template Two** are returned.

If you do not specify a value for this input, it returns all of the vApp templates in the virtual datacenter.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsTemplates

A JSON (JavaScript Object Notation) array of the vApp template names.

Note: This operation returns the list of vApp templates as a JSON array. Use the **Array Iterator** operation to iterate through the list.

Publish Catalog

The **Publish Catalog** operation publishes a catalog for an organization. Catalogs help organize vApp templates and removable media images within your organization. Published catalogs can be accessed by other organizations.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization for which to publish a catalog.

catalog

The name of the catalog to publish.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You cannot publish a catalog unless the organization allows catalog publishing. You can use the **Modify Organization** operation to modify this policy.

Unpublish Catalog

The **Unpublish Catalog** operation unpublishes a catalog for an organization. Catalogs help organize vApp templates and removable media images within your organization. Other organizations cannot access unpublished catalogs.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization from which to unpublish the catalog.

catalog

The name of catalog to unpublish.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Upload Media Image to Catalog

The **Upload Media Image to Catalog** operation uploads a media image from the RAS to a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization from which to upload the media image.

orgVdc

The virtual datacenter for the new media image.

catalog

The catalog to which to add the new media image.

localPath

The path on the RAS to the .iso or floppy image to upload.

mediaName

The name of the new media image in the virtual datacenter.

mediaType

The media image type. The valid values are **ISO** and **FLOPPY**.

description

A description of the new media image.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- Media images can be organized in a catalog, but they are stored in a virtual datacenter.
- Depending on the size of the media image, this operation can take a long time to run.

Upload OVF as vApp Template

The **Upload OVF as vApp Template** operation uploads an OVF image from the RAS to a virtual datacenter where it becomes a vApp template.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

localPath

The path on the RAS to the .ovf file to upload. Any .vmdk files referenced in the .ovf descriptor must be in the same directory.

org

The name of the organization for the new vApp template.

orgVdc

The virtual datacenter for the new vApp template.

catalog

The catalog to which to add the new vApp template.

template

The name of the new vApp template in the virtual datacenter.

description

A description of the new vApp template.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- vApp templates can be organized in a catalog, but they are stored in a virtual datacenter.
- Only OVF version 1.0 and 1.1 images are supported.
- Depending on the size of the disk images of the OVF, this operation can take a long time to run.

Organizations

Networks

Create Direct Organization Network

The **Create Direct Organization Network** operation creates an organization network that is directly connected to an external network.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of organization in which to create the network.

externalNetwork

The name of the external network to connect to. You can get a list of external networks using the **Get External Networks** operation.

network

The name of the new organization network.

description

A description for the new network.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Delete Organization Network

The **Delete Organization Network** operation deletes an organization network.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of organization from which to delete the network.

network

The name of organization network to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Get External Networks

The **Get External Networks** operation retrieves a list of external networks. You can also use this operation to search for an external network.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

network

The name of the external network to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all external networks that contain the input value.

For example, if you have two external networks named **Network One** and **Network Two** and you specify an input value of **one**, the search only returns **Network One**. If, however, you specify an input value of **network**, both **Network One** and **Network Two** are returned.

If you do not specify a value for this input, it returns all of the external networks.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsNetworks

A JSON (JavaScript Object Notation) array of the external network names.

Note: This operation returns the list of external networks as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Get Organization Networks

The **Get Organization Networks** operation retrieves a list of organization networks. You can also use this operation to search for an organization network.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization to search for networks.

network

The name of the organization network. If you specify a value for this input, the operation performs a case-insensitive search that returns all organization networks that contain the input value.

For example, if you have two organization networks named **Network One** and **Network Two** and you specify an input value of **one**, the search only returns **Network One**. If, however, you specify an input value of **network**, both **Network One** and **Network Two** are returned.

If you do not specify a value for this input, the operation returns all of the organization networks.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsNetworks

A JSON (JavaScript Object Notation) array of the organization network names.

Note: This operation returns the list of organization networks as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Create Organization

The **Create Organization** operation creates a new organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the new organization to create.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You can customize the organization after you create it using the **Modify Organization** operation.

Create Organization vDC

The **Create Organization vDC** operation creates a new organization virtual datacenter (vDC). Resources for the new organization vDC are allocated from a provider vDC.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization in which to create the new virtual datacenter.

orgVdc

The name of the new organization virtual datacenter.

providerVdc

The name of the provider virtual datacenter from which to allocate resources.

allocationModel

The allocation model to control the quality of service (QoS) guaranteed to the new organization vDC. The valid values include:

- **ALLOCATION_V_APP** – The pay-as-you-go model. Resources are committed only when vApps are created in the organization vDC.
- **ALLOCATION_POOL** – Only a percentage of the resources can be committed to the organization vDC.
- **RESERVATION_POOL** – All of the resources you allocate are committed to the organization vDC.

storageLimit

The maximum amount of storage, in megabytes (MB), that you can allocate in the new organization vDC.

thinProvision

Specifies whether to enable thin provisioning of live storage in the new organization vDC. The valid values are **true** and **false**. The default value is **false**.

vmLimit

The maximum number of virtual machines (VMs) that you can create in the new organization vDC. If you specify a value of **0** or do not specify a value, no limit is enforced.

cpuAllocation

The guaranteed amount of CPU resources, in megahertz (MHz), for the new organization vDC.

cpuLimit

The maximum amount of CPU resources in, megahertz (MHz), which can be consumed by the new organization vDC.

memAllocation

The guaranteed amount of memory resources, in megabytes (MB), for the new organization vDC.

memLimit

The maximum amount of memory resources, in megabytes (MB), which can be consumed by the new organization vDC.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- vApps are stored and executed in organization vDCs.
- vApp templates and media images are also stored in organization vDCs.

Delete Organization

The **Create Organization** operation deletes an existing organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The organization must be empty and disabled before you can delete it. You can disable an organization using the **Disable Organization** operation.

Delete Organization vDC

The **Delete Organization vDC** operation deletes an organization virtual datacenter (vDC).

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization from which to delete the virtual datacenter.

orgVdc

The name of the organization virtual datacenter (vDC) to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The organization vDC must be empty and disabled before you can delete it. You can disable an organization vDC using the **Disable Organization vDC** operation.

Disable Organization

The **Disable Organization** operation disables an existing organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization to disable.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You can disable organizations to prevent access or changes during maintenance.

Disable Organization vDC

The **Disable Organization vDC** operation disables an existing organization virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization of the virtual datacenter to disable.

orgVdc

The name of the organization virtual datacenter to disable.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You can disable organization vDCs to prevent access or changes during maintenance.

Enable Organization

The **Enable Organization** operation enables an existing organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization to enable.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Enable Organization vDC

The **Enable Organization vDC** operation enables an existing organization virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization of the virtual datacenter to enable.

orgVdc

The name of the organization virtual datacenter to enable.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Get Organization vDCs

The **Get Organization vDCs** operation retrieves a list of organization virtual datacenters (vDCs) from an organization. You can also use this operation to search for an organization virtual datacenter in an organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization in which to search for virtual datacenters.

orgVdc

The name of the organization virtual datacenter to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all organization virtual datacenters that contain the input value.

For example, if you have two datacenters named **Datacenter One** and **Datacenter Two** and you specify an input value of **one**, the search only returns **Datacenter One**. If, however, you specify an input value of **datacenter**, both **Datacenter One** and **Datacenter Two** are returned.

If you do not specify a value for this input, the operation returns all of the organization virtual datacenters.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsVdcs

A JSON (JavaScript Object Notation) array of vDC names.

Note: This operation returns the list of organization virtual datacenters as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Get Organizations

The **Get Organizations** operation retrieves a list of organizations. You can also use this operation to search for an organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all organizations that contain the input value.

For example, if you have two organizations named **Organization One** and **Organization Two** and you specify an input value of **one**, the search only returns **Organization One**. If, however, you specify an input value of **organization**, both **Organization One** and **Organization Two** are returned.

If you do not specify a value for this input, the operation returns all of your organizations.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsOrgs

A JSON (JavaScript Object Notation) array of organization names.

Note: This operation returns the list of organizations as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Modify Organizations

The **Modify Organization** operation modifies settings for an organization.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization to modify.

description

A new description for the organization. If you do not specify a value for this input, this attribute does not change.

allowPublish

Specifies whether the organization can publish catalogs that all other organizations can use. The valid values are **true** (allow publishing) and **false** (disallow publishing). If you do not specify a value for this input, this attribute does not change.

useSystemLdap

Specifies whether the organization uses the vCloud Director system LDAP service. The valid values are **true** (use system LDAP) and **false** (do not use LDAP). If you do not specify a value for this input, this attribute does not change.

ldapOU

The distinguished name for LDAP OU if the organization uses the vCloud system LDAP service (for example, **ou=Users,dc=example,dc=local**). If you do not specify a value for this input, this attribute does not change.

deploymentSeconds

The default maximum runtime lease, in seconds, for vApps created in the organization. If you do not specify a value for this input, this attribute does not change.

storageSeconds

The default maximum storage time lease to set, in seconds, for vApps created in the organization. If you do not specify a value for this input, this attribute does not change.

deleteOnExpire

Specifies whether a vApp should be permanently deleted when its storage lease expires. The valid values are **true** (delete) or **false** (move to expired items). If you do not specify a value for this input, this attribute does not change.

vmLimit

The default maximum number of virtual machines (VMs) that can be powered on by a user in a virtual datacenter (vDC). If you specify a value of **0**, no limit is enforced. If you do not specify a value for this input, this attribute does not change.

storedVmLimit

The default maximum number of virtual machines (VMs) that can be stored by a user in a virtual datacenter (vDC). If you specify a value of **0**, no limit is enforced. If you do not specify a value for this input, this attribute does not change.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

vApps

Delete vApp

The **Delete vApp** operation deletes a vApp from a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization that contains the vApp to delete.

orgVdc

The virtual datacenter that contains the vApp to delete.

vApp

The name of the vApp to delete.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The vApp must be stopped before you can delete it. You can stop the vApp using the **Stop vApp** operation.

Edit VM Network

The **Edit VM Network** operation edits a network connection for a virtual machine (VM) inside of a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization that contains the vApp.

orgVdc

The virtual datacenter that contains the vApp.

vApp

The name of the vApp for which to edit the virtual machine.

virtualMachine

The name of the virtual machine for which to edit the network settings.

nicId

The identifying number for the network card to edit on the VM. The first network card in the VM has an ID of **0**.

network

The name of the organization network to which to connect the network card. If you do not specify a value for this input, this attribute does not change.

ipMode

The IP address allocation mode for this network card. If you do not specify a value for this input, this attribute does not change. The valid values are:

- **MANUAL** – If you specify this value, the operation uses the static IP address specified in the **staticIp** input.
- **POOL** – If you specify this value, the operation assigns a static IP address from the IP pool of the network.
- **DHCP** – If you specify this value, the operation uses DHCP on the network to acquire an IP address.

staticIp

The static IPv4 address to use when you specify value of **MANUAL** for the **ipMode** input. Otherwise, this input is ignored.

resetMac

Specifies whether the MAC address of the network card is reset to another value. The valid values are **true** (the MAC address of the network card is not reset to another value) and **false** (the MAC address of the network card is reset to another value). This input is useful if there is a MAC address conflict after the copying of a vApp. If you do not specify a value for this input, the MAC address does not change.

isConnected

Specifies whether the network is connected to the network card. The valid values are **true** and **false**. If you specify a value of **true**, the network is connected to the network card. If you specify a value of **false**, the network is disconnected from the network card. If you do not specify a value for this input, the connection state does not change.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The vApp must be stopped before you can delete it. You can stop the vApp using the **Stop vApp** operation.

Get vApp Lease Settings

The **Get vApp Lease Settings** operation retrieves the lease settings and status of a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter of the vApp.

vApp

The name of the vApp from which to get the lease settings.

localeLang

The locale language for the date and time string (for example, **en** for English or **ja** for Japanese). This value is used in the **deploymentExpire** and **storageExpire** results. If you do not specify a value for this input, the default locale of the RAS is used.

localeCountry

The locale country for the date and time string (for example, **US** or **JP**). If you do not specify a value for the **localeLang** input, this input is ignored.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

deploymentSeconds

The maximum runtime lease configured for this vApp, in seconds.

storageSeconds

The maximum storage time lease configured for this vApp, in seconds.

deploymentExpire

A localized date and time string that specifies when the runtime lease of this vApp expires. If the vApp is stopped, this result is **null**.

storageExpire

A localized date and time string that specifies when the storage lease of this vApp expires. If the vApp is running, this result is **null**.

Note: vApps are automatically stopped if the deployment lease has expired. They are deleted or moved if the storage lease has expired.

Get vApp State

The **Get vApp State** operation retrieves the running state of a vApp in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter that contains the vApp.

vApp

The name of the vApp from which to get the state.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- vApps can be stopped, running, partially running, or suspended.
- To get the running state of a particular VM inside a vApp, you can use the **Get VM State** operation.

Get vApp VMs

The **Get vApp VMs** operation retrieves a list of virtual machines (VMs) from a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter of the vApp.

vApp

The name of the vApp from which to get the virtual machines.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsVMs

A JSON (JavaScript Object Notation) array of the virtual machine names.

Note: This operation returns the list of VMs as a JSON array. You can use **Array Iterator** operation to iterate through the list.

Get vApps

The **Get vApps** operation retrieves a list of vApps from a virtual datacenter. You can also use this operation to search for a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The name of the organization in which to search for the vApps.

orgVdc

The virtual datacenter from which to search for the vApps.

vApp

The name of the vApp to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all vApps that contain the input value.

For example, if you have two vApps named **vApp One** and **vApp Two** and you specify an input value of **one**, the search only returns **vApp One**. If, however, you specify an input value of **vApp**, both **vApp One** and **vApp Two** are returned.

If you do not specify a value for this input, the operation returns all of the vApps in the virtual datacenter.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsVApps

A JSON (JavaScript Object Notation) array of vApp names.

Note: This operation returns the list of vApps as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Get VM Details

The **Get VM Details** operation retrieves details about a virtual machine (VM) from a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter of the vApp.

vApp

The name of the vApp that contains the desired virtual machine.

virtualMachine

The name of the virtual machine to get details of.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

cpuCount

The number of CPUs configured for the VM. Example: 2

jsIpAddresses

A JSON (JavaScript Object Notation) array of all the known IP addresses of the VM. Addresses could be either IPv4 or IPv6 addresses. Example: ["192.168.1.123","192.168.2.234"]

jsNicNumbers

A JSON (JavaScript Object Notation) array of the numerical identifiers of the NIC configured for the VM. Details of each NIC can be retrieved using "Get VM NIC Details" using each NIC

number. These values map to NIC numbers for a virtual machine in the vCloud Director UI. The values typically start at 0. Example: ["0","1"]

jsDiskNumbers

A JSON (JavaScript Object Notation) array of the numerical identifiers of the disks configured for the VM. Details of each disk can be retrieved using "Get VM Disk Details" using each disk number. The values typically start from 1. Example: ["1","2"]

memSizeMB

The size of the RAM configured for the VM in megabytes. Example: 2048

os

The descriptive name of the guest operating system of the VM.

Example: "Microsoft Windows Server 2008 R2 (64-bit)".

vSphereMOR

The managed object reference identifier of the VM. This could be used to identify the VM while using "VMware Virtual Infrastructure and vSphere" operations. Example: "vm-123"

Get VM Disk Details

The **Get VM Disk Details** operation retrieves details about a hard disk on a virtual machine (VM) from a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter of the vApp.

vApp

The name of the vApp that contains the desired virtual machine.

virtualMachine

The name of the virtual machine to get details of.

diskNumber

The hard disk number to get details of. Examples: 1, 2

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

diskSize

The provisioned size of the hard disk in megabytes (MB).

diskBusType

The disk bus type the disk is attached to. Potential values: buslogic, lsilogic, lsilogicsas, VirtualSCSI

Get VM NIC Details

The **Get VM NIC Details** operation retrieves details about a NIC on a virtual machine (VM) from a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter of the vApp.

vApp

The name of the vApp that contains the desired virtual machine.

virtualMachine

The name of the virtual machine to get details of.

nicNumber

The NIC number to get details of. Examples: 0, 1

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

ipAddress

Current assigned or known IP address for the NIC. Example: "10.12.34.56".

ipMode

The IP address allocation mode for the NIC. Potential values: MANUAL, POOL, DHCP, NONE.

isConnected

Connection state of the NIC. Returns true if it is connected. Returns false if it is disconnected.

macAddress

The current mac address of the NIC. Example: "00:50:56:ab:cd:ef".

network

The name of the network that the NIC is attached to.

Get VM State

The **Get VM State** operation retrieves the running state of a VM from a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter that contains the vApp.

vApp

The name of the vApp from which to get the virtual machine state.

virtualMachine

The name of the virtual machine of which to get the running state.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: VMs can be powered off, powered on, or suspended.

Reset vApp

The **Reset vApp** operation resets a vApp running in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization to which the vApp to reset belongs.

orgVdc

The virtual datacenter to which the vApp to reset belongs.

vApp

The name of the vApp to reset.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You can only reset a vApp if it is running.

Set vApp Lease Settings

The **Set vApp Lease Settings** operation sets runtime and storage lease settings for a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization of the vApp.

orgVdc

The virtual datacenter of the vApp.

vApp

The name of the vApp for which to set lease settings.

deploymentSeconds

The maximum runtime lease to set for the vApp, in seconds. This lease setting is set to the vApp only if you specify a value for this input and the value is greater than **0**.

storageSeconds

The maximum storage time lease to set for the vApp, in seconds. This lease setting is set to the vApp only if you specify a value for this input and the value is greater than **0**.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Notes:

- vApps are stopped automatically when the deployment lease expires.
- vApps are deleted or moved if the storage lease expires.

- You can also use this operation to reset leases for a vApp. To do this, retrieve the current **deploymentSeconds** and **storageSeconds** input values with the **Get vApp Lease Settings** operation, and then set those same values in this operation to reset the runtime and storage leases.

Start vApp

The **Start vApp** operation starts a vApp in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization to which the vApp to start belongs.

orgVdc

The virtual datacenter to which the vApp to start belongs.

vApp

The name of the vApp to start.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: This operation resumes a vApp that is currently suspended.

Stop vApp

The **Stop vApps** operation stops a vApp running in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization to which the vApp to stop belongs.

orgVdc

The virtual datacenter to which the vApp to stop belongs.

vApp

The name of the vApp to stop.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Suspend vApp

The **Suspend vApp** operation suspends a vApp running in a virtual datacenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

org

The organization to which the vApp to suspend belongs.

orgVdc

The virtual datacenter to which the vApp to suspend belongs.

vApp

The name of the vApp to suspend.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: You can only suspend a vApp if it is running.

vCenters

Get vCenters

The **Get vCenters** operation retrieves a list of vCenters managed by vCloud. You can also use this operation to search for a vCenter.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

vCenter

The name of the vCenter to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all vCenters that contain the input value.

For example, if you have two vCenters named **vCenter One** and **vCenter Two** and you specify an input value of **one**, the search only returns **vCenter One**. If, however, you specify an input value of **vCenter**, both **vCenter One** and **vCenter Two** are returned.

If you do not specify a value for this input, the operation returns all of the vCenters.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsvCenters

A JSON (JavaScript Object Notation) array of the vCenter names.

Note: This operation returns the list of vCenters as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Get Virtual Machines

The **Get Virtual Machines** operation retrieves a list of virtual machines (VMs) managed by a vCenter. You can also use this operation to search for a virtual machine.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

vCenter

The name of the vCenter from which to get the virtual machines.

virtualMachine

The name of the virtual machine to search for. If you specify a value for this input, the operation performs a case-insensitive search that returns all virtual machines that contain the input value.

For example, if you have two virtual machines named **Virtual Machine One** and **Virtual Machine Two** and you specify an input value of **one**, the search only returns **Virtual Machine One**. If, however, you specify an input value of **Virtual Machine**, both **Virtual Machine One** and **Virtual Machine Two** are returned.

If you do not specify a value for this input, the operation returns all of the virtual machines.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

jsVMs

A JSON (JavaScript Object Notation) array of virtual machine names.

Note: This operation returns the list of virtual machines as a JSON array. You can use the **Array Iterator** operation to iterate through the list.

Import Virtual Machine as vApp

The **Import Virtual Machine as vApp** operation imports a virtual machine from a vCenter as a vApp.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

vCenter

The name of the vCenter from which to import the virtual machine.

virtualMachine

The name of the virtual machine to import as a vApp.

org

The organization for the new vApp.

orgVdc

The virtual datacenter for the new vApp.

vApp

The name of the new vApp.

description

A description of the new vApp.

sourceMove

Specifies whether to move the source virtual machine to the cloud. The valid values are **true** and **false**. If you specify a value of **true** for this input, the source virtual machine is moved to the vCloud managed resource pools and should no longer be managed manually in the vCenter. If you specify a value of **false**, the virtual machine is copied to the vCloud managed resource pools and the original virtual machine is removed. The default value is **false**.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Note: The new vApp is not attached to any organization network. You can use the **Edit VM Network** operation to attach a VM network interface to an organization network.

Import Virtual Machine as vApp Template

The **Import Virtual Machine as vApp** operation imports a virtual machine from a vCenter as a vApp template.

All of the operation's inputs except the following are described in [Common inputs in the integration](#).

vCenter

The name of the vCenter from which to import the virtual machine.

virtualMachine

The name of the virtual machine to import as a vApp template.

org

The organization for the new vApp template.

orgVdc

The virtual datacenter for the new vApp template.

template

The name of the new vApp template.

catalog

The catalog to which to add the new vApp template.

description

A description of the new vApp template.

sourceMove

Specifies whether to move the source virtual machine to the cloud. The valid values are **true** and **false**. If you specify a value of **true** for this input, the source virtual machine is moved to the vCloud managed resource pools and should no longer be managed manually in the vCenter. If you specify a value of **false**, the virtual machine is copied to the vCloud managed resource pools and the original virtual machine is not removed. The default value is **false**.

The operation returns the following:

returnResult

If the operation fails, this result specifies the reason for the error.

Security

This section describes how security is handled by the VMware vCloud integration.

VMware vCloud servers are accessed via REST over HTTPS. Usernames and passwords are used to authenticate a user and create a session for the duration of an operation. Sessions are closed at the completion of each operation.

Tools

Following are OO tools that you can use with the VMware vCloud integration:

- **RSFlowInvoke.exe** and **JRSFlowInvoke.jar**

RSFlowInvoke (RSFlowInvoke.exe or the Java version, JRSFlowInvoke.jar) is a command-line utility that allows you to start a flow without using Central (although the Central service must be running). RSFlowInvoke is useful when you want to start a flow from an external system, such as a monitoring application that can use a command line to start a flow.

- **Web Services Wizard (wswizard.exe)**

When you run the Web Services Wizard, you provide it with the WSDL for a given Web service. The WSDL string you provide as a pointer can be a file's location and name or a URL. The Web Services Wizard displays a list of the methods in the API of the Web service that you specify. When you run the wizard, pick the methods you want to use, and with one click for each method you have selected, the wizard creates an HP OO operation that can execute the method. This allows you to use the Web Services Wizard to create operations from your monitoring tool's API.

These tools are available in the Operations Orchestration home directory under the /Studio/tools/ folder.