HP Operations Orchestration

For the Windows and Linux operating systems

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VMware vCloud Integration Guide

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Introduction

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About the VMware vCloud Integration

vCloud Director (vCD) provides the interface, automation, and management required by enterprises and service providers to build private and public clouds.

vCD uses the REST-ful vCloud API to communicate between vSphere datacenters. vCD is intended to replace the VMWare Lab Manager product.

The vCloud architecture is reflected in the integration by a set of objects common to cloud computing environments and also by a new layer of abstraction: **vApp**. A vApp is a collection of virtual machines (and potentially other vApp containers) that are operated and monitored as a unit. The set of objects common to cloud computing environments have the following high-level properties:

- Catalogs
- Organizations
- Networks
- vApps
- VMs
- Tasks
- Virtual Datacenters (vCenters)

Note: For more information about vCloud Director see:

http://www.vmware.com/files/pdf/products/vCloud/VMware-vCloud-Director-Datasheet.pdf

Use Cases

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. Managing Catalogs:
   - Create Catalogs
   - Create Template From vApp
   - Delete Catalog
   - Delete Media Image
   - Delete vApp Template
   - Deploy vApp From Template
   - Download vApp Template as OVF
   - Get Catalogs
   - Get Media
   - Get vApp Templates
   - Publish Catalog
   - Unpublish Catalog
   - Upload Media Image to Catalog
   - Upload OVF as vApp Template
2. Managing Organizations:
   - Networks

     Create Direct Organization Network

     Delete Organization Network

     Get External Networks

     Get Organization Networks
   - Managing Organization vDC:

     Create Organization vDC

     Delete Organization vDC

     Disable Organization vDC

Enable Organization vDC

Get Organization vDCs

- Networks

  Create Direct Organization vDC Network

  Delete Organization vDC Network

  Get Organization vDC Networks

- Create Organization
- Delete Organization
- Disable Organization
- Enable Organization
- Get Organization Tasks
- Get Organizations
- Modify Organization

3. Managing vApps:

   - VMs

     Edit VM Network

     Get vApp VMs

     Get VM Details

     Get VM Disk Details

     Get VM NIC Details

     Get VM State

     Power Off VM

     Power On VM

     Set VM Computer Name

     Set VM CPU Count

Set VM Memory Size

- Delete vApp
- Get vApp Lease Settings
- Get vApp State
- Recompose vApp
- Reset vApp
- Set vApp Lease Settings
- Start vApp
- Stop vApp
- Suspend vApp

4. Managing vCenters:
   - Get vCenters
   - Get Virtual Machines
   - Import Virtual Machine as vApp
   - Import Virtual Machine as vApp Template

Supported Versions

Operations Orchestration Version	VMware vCloud Version
OO Content Pack 14	1.0, 1.5, 5.1, 5.1.1

Downloading OO Releases and Documents on HP Live Network

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To register for an HP Passport ID:

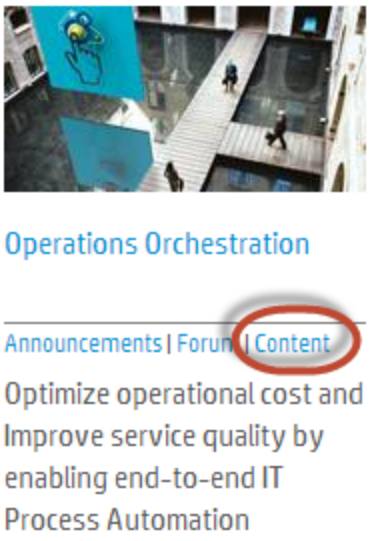
Go to: http://h20229.www2.hp.com/passport-registration.html

Or

Click the **New users - please register** link on the HP Passport login page

To download OO releases and documents:

1. Go to the HPLN site: https://hpln.hp.com/. Page 1 of HP Live Network page opens.
2. Go to page 2 and click the **Content** link under **Operations Orchestration**.



3. From the **Content Catalog** tab, select **Operations Orchestration Content Packs**.
4. Select the Downloads link.
5. Click **Downloads > HP Operations Orchestration 9.00**.
6. Click on HP Operations Orchestration Content Pack 14.

Getting Started

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Installing and Configuring the Installation

The VMware vCloud integration does not require any special installation and configuration instructions. 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/<version>/schema/master.xsd
```

The displayed xml should look something like this:

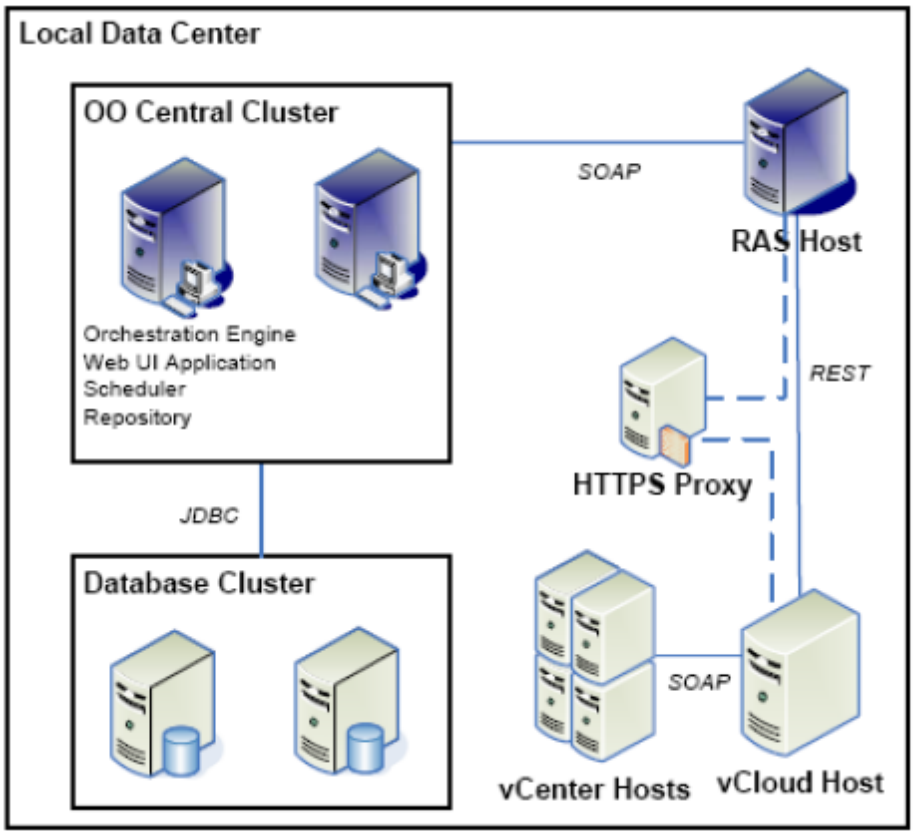
```
<xs:schema targetNamespace="http://www.vmware.com/vcloud/v1"
elementFormDefault="qualified" version="1.0">
<xs:include
schemaLocation="http://<vCloudServer>/api/v1.0/schema/vcloud.xsd"/>
<xs:include
schemaLocation="http://<vCloudServer>/api/v1.0/schema/admin.xsd"/>
</xs:schema>
```

VMware vCloud OO 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 versions 1.0, 1.5, and 5.1

The API information for all vCD versions can be found at the following web site:

http://www.vmware.com/support/pubs/vcd_pubs.html



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.

Href. An object reference, expressed in URL format. Because this URL includes the object identifier portion of the id attribute value, it uniquely identifies the object, persists for the life of the object, and is never reused. The value of the href attribute is a reference to a view of the object, and can be used to access a representation of the object that is valid in a particular context. Although URLs have a well-known syntax and a well-understood interpretation, a client should treat each href as an opaque string. The rules that govern how the server constructs href strings might change in future releases.

Id. The object identifier, expressed in URN format. The value of the id attribute uniquely identifies the object, persists for the life of the object, and is never reused. The id attribute value is intended to provide a context-free identifier that can be used with the vCloud API entityResolver and is also suitable for use by clients that need to access the object using a different API.

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). 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.

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.

Tasks. Asynchronous operations that members of an organization initiate are tracked by task objects, which are kept on the organization's tasks list.

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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.

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

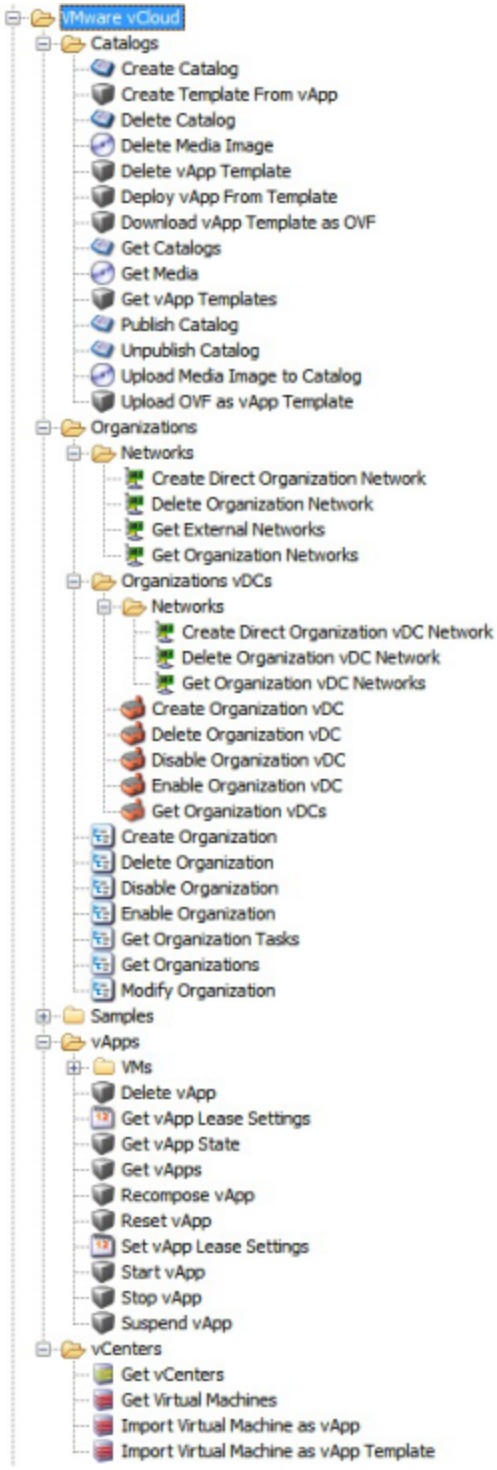
Common Inputs in the Integration

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

Input	Description
host	The vCO Web service host. You can specify the host by using its IP address (for example, 10.2.255.116) or its DNS name (for example, myvsphere.company.com).
port	The server port on which the vCO Web service is running. The default port is 8281.
protocol	The protocol used to communicate with the vCO server, either http or https. The default protocol is https.
username	The username to use to connect to vCo.
password	The password for the username.
vcoVersion	The VMware vCenter Orchestrator version. Defaults to 5.5

Location of VMware vCloud Integration Operations and Flows in OO Studio

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


VMware vCloud
Catalogs
Create Catalog
Create Template From vApp
Delete Catalog
Delete Media Image
Delete vApp Template
Deploy vApp From Template
Download vApp Template as OVF
Get Catalogs
Get Media
Get vApp Templates
Publish Catalog
Unpublish Catalog
Upload Media Image to Catalog
Upload OVF as vApp Template
Organizations
Networks
Create Direct Organization Network
Delete Organization Network
Get External Networks
Get Organization Networks
Organizations vDCs
Networks
Create Direct Organization vDC Network
Delete Organization vDC Network
Get Organization vDC Networks
Create Organization vDC
Delete Organization vDC
Disable Organization vDC
Enable Organization vDC
Get Organization vDCs
Create Organization
Delete Organization
Disable Organization
Enable Organization
Get Organization Tasks
Get Organizations
Modify Organization
Samples
vApps
VMs
Delete vApp
Get vApp Lease Settings
Get vApp State
Get vApps
Recompose vApp
Reset vApp
Set vApp Lease Settings
Start vApp
Stop vApp
Suspend vApp
vCenters
Get vCenters
Get Virtual Machines
Import Virtual Machine as vApp
Import Virtual Machine as vApp Template

VMware vCloud 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.

OO Tools You Can Use with the VMware vCloud Integration

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 folder in **/Studio/tools/**.

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