

HP Operations Orchestration Software

Software Version: 9.00

Citrix XenServer Integration Guide

Document Release Date: June 2010

Software Release Date: June 2010



Legal Notices

Warranty

The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

The information contained herein is subject to change without notice.

Restricted Rights Legend

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

Copyright Notices

© Copyright 2009-2010 Hewlett-Packard Development Company, L.P.

Trademark Notices

For information on open-source and third-party software acknowledgements, see in the documentation set for this release, Open-Source and Third-Party Software Acknowledgements (3rdPartyOpenNotices.pdf).

On the Web: Finding OO support and documentation

There are two Web sites where you can find support and documentation, including updates to OO Help systems, guides, and tutorials:

- The OO Support site
- BSA Essentials Network

Support

Documentation enhancements are a continual project at Hewlett-Packard Software. You can obtain or update the HP OO documentation set and tutorials at any time from the HP Software Product Manuals Web site. You will need an HP Passport to log in to the Web site.

To obtain HP OO documentation and tutorials

1. Go to the HP Software Product Manuals Web site (<http://support.openview.hp.com/selfsolve/manuals>).
2. Log in with your HP Passport user name and password.
OR

If you do not have an HP Passport, click **New users – please register** to create an HP Passport, then return to this page and log in.

If you need help getting an HP Passport, see your HP OO contact.

3. In the **Product** list box, scroll down to and select **Operations Orchestration**.
4. In the **Product Version** list, click the version of the manuals that you're interested in.
5. In the **Operating System** list, click the relevant operating system.
6. Click the **Search** button.
7. In the **Results** list, click the link for the file that you want.

BSA Essentials Network

For support information, including patches, troubleshooting aids, support contract management, product manuals and more, visit the following site: <http://www.hp.com/go/bsaessentialsnetwork>

This is the **BSA Essentials Network** Web page. To sign in:

1. Click **Login Now**.
2. On the **HP Passport sign-in** page, enter your HP Passport user ID and password and then click **Sign-in**.
3. If you do not already have an HP Passport account, do the following:
 - a. On the **HP Passport sign-in** page, click **New user registration**.
 - b. On the **HP Passport new user registration** page, enter the required information and then click **Continue**.
 - c. On the confirmation page that opens, check your information and then click **Register**.
 - d. On the **Terms of Service** page, read the Terms of use and legal restrictions, select the **Agree** button, and then click **Submit**.
4. On the **BSA Essentials Network** page, click **Operations Orchestration Community**.

The Operations Orchestration Community page contains links to announcements, discussions, downloads, documentation, help, and support.

Note: Contact your OO contact if you have any difficulties with this process.

In OO: How to find Help, PDFs, and tutorials

The HP Operations Orchestration software (HP OO) documentation set is made up of the following:

- Help for Central

Central Help provides information to the following:

- Finding and running flows
- For HP OO administrators, configuring the functioning of HP OO
- Generating and viewing the information available from the outcomes of flow runs

The Central Help system is also available as a PDF document in the HP OO home directory, in the \Central\docs subdirectory.

- Help for Studio

Studio Help instructs flow authors at varying levels of programming ability.

The Studio Help system is also available as a PDF document in the HP OO home directory, in the \Studio\docs subdirectory.

- Animated tutorials for Central and Studio

HP OO tutorials can each be completed in less than half an hour and provide basic instruction on the following:

- In Central, finding, running, and viewing information from flows
- In Studio, modifying flows

The tutorials are available in the Central and Studio subdirectories of the HP OO home directory.

- Self-documentation for operations and flows in the Accelerator Packs and ITIL folders

Self-documentation is available in the descriptions of the operations and steps that are included in the flows.

Table of Contents

Warranty	ii
Restricted Rights Legend	ii
Trademark Notices	ii
On the Web: Finding OO support and documentation.....	iii
Support	iii
BSA Essentials Network.....	iii
In OO: How to find Help, PDFs, and tutorials.....	iv
Table of Contents	v
Overview	1
Use cases and scenarios.....	1
Flows and operations.....	1
Host.....	1
Network	2
Physical Network Interfaces	2
Virtual Network Interfaces.....	2
Virtual Networks.....	2
Storage	2
Storage Repositories	2
Virtual Block Devices.....	2
Virtual Disk Images	3
Task	3
Virtual Machines	3
Guest.....	3
Power	4
Sample flows.....	4
Samples.....	4

Versions and components	5
Architecture	5
Installation and configuration instructions	6
Operation specifics	6
Overview of XenServer components	6
Acronyms	6
Troubleshooting	7
General troubleshooting procedures	7
Security	7
Tools	8

Overview

This integration helps administrators build HP Operations Orchestration (OO) flows that are integrated with Citrix XenServer.

This document explains the integration's implementation and the operations that are included for communicating between OO and XenServer.

Use cases and scenarios

1. Virtual machine (VM) state-related operations
 - Start/Shutdown/Reboot VM
 - Pause/Unpause VM
 - Suspend/Resume VM
2. VM provisioning and removal
 - Create or destroy VM
 - Clone or copy VM
 - Manage physical or virtual storage devices
 - Manage physical or virtual network devices
3. Administer VM
 - Snapshot administration (including taking and reverting to snapshots)
 - Cold and hot migration
4. Administer virtual network devices
 - Create or delete
 - Assign VMs to a virtual network
5. Administer asynchronous operations
 - Find/Cancel tasks

Flows and operations

In the Citrix XenServer integration, the following operations provide ways to find, create, destroy, and manipulate XenServer objects. These operations and flows are located in the `\Library\Integrations\Citrix XenServer\` folder in Studio.

Host

Find Hosts

Finds hosts on XenServer.

Network

Physical Network Interfaces

Find PIFs

Finds physical network interfaces (PIFs) on XenServer.

Virtual Network Interfaces

Create VIF

Creates a virtual network interface (VIF).

Destroy VIF

Destroys a VIF.

Find VIFs

Finds VIFs on XenServer.

Virtual Networks

Create Virtual Network

Create a virtual network.

Destroy Virtual Network

Destroys a virtual network.

Find Virtual Networks

Finds virtual networks on XenServer.

Storage

Storage Repositories

Find SR

Finds storage repositories (SRs) on XenServer.

Virtual Block Devices

Create VBD

Creates a virtual block device (VBD).

Destroy VBD

Destroys a VBD.

Eject VBD

Removes the media from the device and leaves it empty.

Find VBD

Finds VBDs on XenServer.

Hot Plug VBD

Hot-plugs a specified VBD, dynamically attaching it to the running VM.

Hot Unplug VBD

Hot-unplug a specified VBD, dynamically detaching it from the running VM.

Insert VBD

Insert new media into the device.

Virtual Disk Images

Create VDI

Creates a virtual disk image (VDI).

Destroy VDI

Destroys a VDI.

Find VDI

Finds VDIs on XenServer.

Task

Cancel Task

Cancels a running task.

Find Tasks

Finds tasks on XenServer.

Virtual Machines

Clone VM

Clones a given VM.

Copy VM

Creates a copy of a given VM.

Create VM Snapshot

Creates a snapshot of a given VM.

Destroy VM

Destroys a given VM while keeping the storage associated with the VM intact.

Find VMs

Finds VMs on XenServer.

Install VM

Installs a new VM in XenServer using a template.

Migrate VM

Migrates the given VM to the target host.

Guest

Pause VM

Pauses the given VM. The VM must be in the RUNNING state.

Resume VM

Resumes the given VM. The VM must be in the SUSPENDED state.

Suspend VM

Suspends the given VM. The VM must be in the RUNNING state.

Unpause VM

Unpauses the given VM. The VM must be in the PAUSED state.

Power

Reboot VM

Reboots a VM. For a clean reboot, the VM must be in the RUNNING state.

Shutdown VM

Powers off a VM. For a clean shutdown, the VM must be in the RUNNING state.

Start VM

Powers on a VM. The VM must be in the HALTED state.

Sample flows

The sample flows in the integration demonstrate and model how to implement the integration's capabilities.

Samples

Check for Task Success

Given a task UUID, waits for the task to complete. While the task is in the PENDING state, sleeps for the specified sleep increment time and checks in a loop. Should the total time exceed the timeout or the task has a FAILURE state, returns a failure. If the task has a SUCCESS state, it returns success.

Create VM from Configured Template

Given a fully configured template, makes a clone and installs the VM. If that runs successfully, starts the VM. A fully configured VM has disk and network configurations set up.

Create VM from Unconfigured Template

Given a template and information for the hardware configuration, clones the VM and sets up the hardware configuration. If everything is built successfully, starts the VM.

Destroy VM and Disks

Deletes a VM from XenServer. If the **deleteDisks** flag is set to true, iterates through and deletes the disks attached to the VM. **Warning:** These disks may be shared by multiple VMs. Make sure that it is safe to delete the disks before doing so. If **deleteDisks** is set to false, simply deletes the VM.

Find List of VMs

Finds VMs on XenServer. Searches based on UUID if a UUID is provided. Otherwise, searches based on the name field. If **isSearchExpression** is set to true, searches name labels that contain the given name. If neither UUID nor name is provided, all records are returned. The **includeTemplates** flag is used to determine whether VM templates should be included in the search results. The list of VMs with their UUIDs and Power States is formatted and printed.

Setup Disk or CD for VM

Given information for an existing disk or the required information for a virtual disk, creates and/or attaches the information to the specified VM. If **existingDiskName** is specified, attaches that disk to the specified VM. If not, **vdimeType**, **newDiskName**, **diskSize**, and **storageRepository** all become required fields and are used to create the disk. VDIs for CDs are usually already created, so to attach the CD, you can pass in the name of the VDI as **existingDiskName**, with VBD information.

Setup Network devices for VM

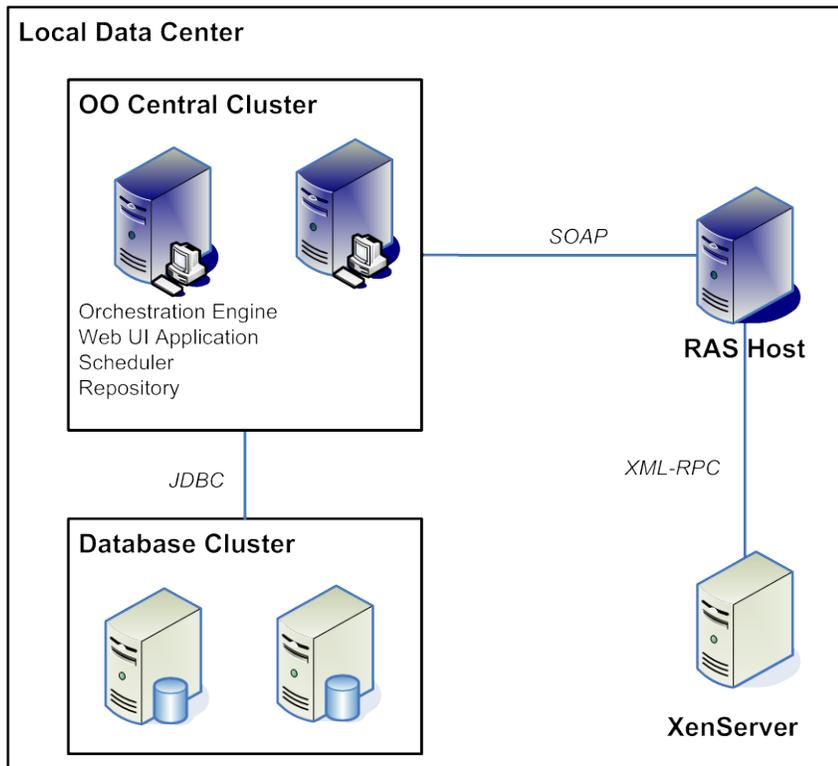
Given a network, a device ID, and a VM name, creates a virtual network interface to the given VM.

Versions and components

Operations Orchestration Version	Citrix XenServer Version
9.00	5.0

Architecture

The XenServer API communicates with the XenServer Host via XML-RPC. You need the hostname, username, and password, and must supply them to inputs. The connection protocol defaults to HTTP, and the default port is 80. These can vary per installation of XenServer.



Installation and configuration instructions

No special installation or configuration is needed to run OO integration operations for XenServer. It is assumed that the XenServer host already has the proper VM templates and storage/network configurations.

Operation specifics

The **Find** operations usually have the option of providing search criteria (such as name and/or UUID). However, if no search criteria are specified, then all records are returned.

Many operations have an **async** option that allows the operation to be run asynchronously—that is, a flow that contains the operation can continue running without waiting for the operation to finish. For such asynchronous operation to be possible, steps that follow the operation that runs asynchronously must not depend on data obtained from it. The **async** option is by default set to false.

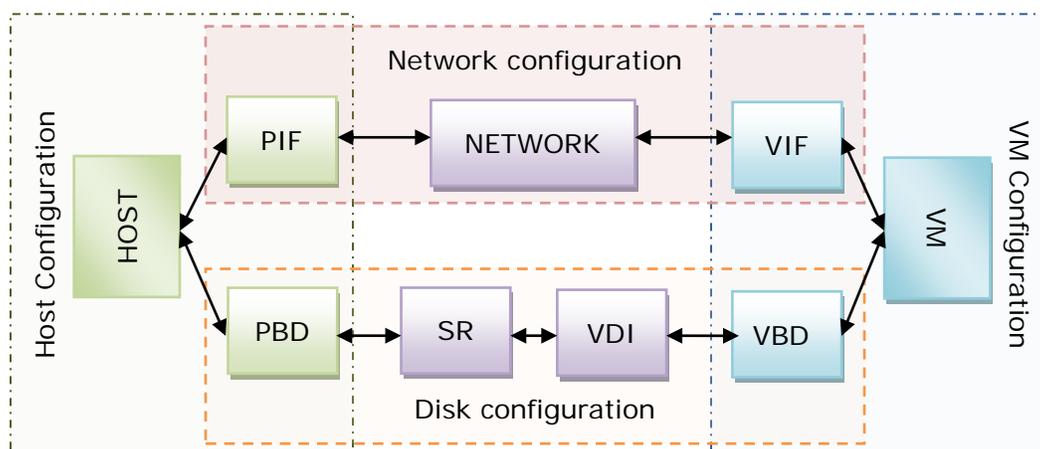
When the operation runs asynchronously, the fields returned by the operation describe the Task created for the operation.

When the operation runs synchronously, the **returnResult** field holds the result of the operation. This result could be a message (for instance, "Shutdown completed" or "VM Destroyed") or a UUID (in the case of operations such as **Copy VM** and **Create VDI**), depending on the function performed by the operation.

The **returnResult** field can also contain error messages. However the **exception** field is guaranteed to have the error message and stack trace for all operations should an error occur.

Overview of XenServer components

In XenServer many components interpose between the virtual machine and the host. The diagram below displays the interactions between the different components.



Acronyms

PIF
Physical network interface

VIF

Virtual network interface

PBD

Physical block device

SR

Storage repository

VDI

Virtual disk image

VBD

Virtual block device

For more information, see the documentation for Citrix XenServer.

Troubleshooting

General troubleshooting procedures

- Verify that the UUIDs or names provided for the operation are valid and are for the correct operation type. For example, VDI UUID's and VBD UUID's cannot be mixed up.
- The 'allowedOperations' result available on most objects (to retrieve this field, execute the Find operation on the object) describes the operations that can be performed on that object in its current state. Trying to perform operations outside of the list of allowed operations will fail. For example, trying to take a snapshot a VDI when the VDI is on a SR that does not support snapshots will fail with the following message:

```
com.xensource.xenapi.Types$BadServerResponse [SR_OPERATION_NOT_SUPPORTED,  
OpaqueRef:b9a7118b-bb3f-3adb-2cfd-8a974a7459fe]
```
- In many cases, the error message from the XenServer API clearly explains what caused the error:

```
"You attempted an operation on a VM that was not in an appropriate power state  
at the time; for example, you attempted to start a VM that was already running.  
The parameters returned are the VM's handle, and the expected and actual VM  
state at the time of the call."
```
- In other cases, the message may not describe the error's cause but rather suggest the error, the state that the object is in, and the state that the object needs to be in for the call to succeed.

Security

Passwords and inputs sent between XenServer and OO are encrypted if the HTTPS protocol is used. If the HTTP protocol is used, information passing between OO and XenServer may not be encrypted.

The XenServer API allows all users of the host machine to open XenServer Sessions. Thus, all users on a XenServer host will be able to execute OO flows against that host using their username/password.

Tools

JRSFlowInvoke

A command-line tool from which flows can be started outside of OO Central.

Web Service Wizard

A tool that displays a list of the methods in the interface of the Web service specified in the Wizard. Within the Wizard, you pick the methods that you want to use, and with one click for each method you select, the Wizard creates an HP OO operation that can execute the method.