HP Operations Orchestration

For Windows and Linux operating systems

Software Version: Content Pack 11

Microsoft System Center Virtual Machine Manager Integration Guide

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Chapter 1

Introduction

This chapter includes:

About the Microsoft System Center Virtual Machine Manager (SCVMM) Integration

SCVMM helps you enable centralized management of physical and virtual IT infrastructure and dynamic resource optimization across multiple virtualization platforms such as Hyper-V. This includes planning, deploying, managing, and optimizing the virtual infrastructure.

The key benefits of SCVMM are that it:

- Centrally creates and manages virtual machines across the entire datacenter.

- Easily consolidates multiple physical servers onto virtual hosts.

- Rapidly provisions and optimizes new and existing virtual machines.

With this integration, administrators can create HP Operations Orchestration (OO) flows that are integrated with SCVMM. Performance and Resource Optimization (PRO) enables the dynamic management of virtual resources through its integration with Operations Manager.

To learn how to create OO flows, see the Studio Guide to Authoring Operations Orchestration Flows in the documentation set for the current OO release.

The SCVMM integration uses Windows PowerShell cmdlets to integrate with OO.

Audience

This guide is intended for system administrators who establish and maintain the implementation of the integration between SCVMM and HP OO. This guide assumes that you have administrative access to both systems.

Prerequisites

This guide is intended for system administrators who establish and maintain the implementation of the integration between SCVMM and HP OO. This guide assumes that you have administrative access to both systems.

Supported Versions

Operations Orchestration Version	SCVMM Version
OO Content Pack 11	2008 R2 2012

Downloading OO Releases and Documents on HP Live Network

HP Live Network provides an Operations Orchestration Community page where you can find and download supported releases of OO and associated documents.

To download OO releases and documents, visit the following site:

https://hpln.hp.com/

> **Note:** This site requires that you register for an HP Passport and sign-in.

To register for an HP Passport ID:

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

   Or

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

2. On the HP Live Network page, click **Operations Orchestration**.

3. On the left-hand side, click **Operations Orchestration Content Packs**.

4. In the **Operations Orchestration Content Packs** box, click **Content**. The HP Passport and sign-in page appears.

5. Enter your user ID and Password to access to continue.

6. Click **HP Operations Orchestration 9.00**.

7. Search for the required HP Operations Orchestration Content Pack.

Chapter 2

Getting Started

This chapter includes:

Installing and Configuring the Integration

The following are some PowerShell requirements and useful notes for configuring the integration:

1. PowerShell 2.0 with WinRM 2.0 must be installed on your RAS machine. You can download the kit from http:\\support.microsoft.com\kb\968930.

2. Before using the SCVMM integration operations, make sure you have enabled PowerShell remoting, by using the **Enable-PSRemoting** cmdlet.

3. In workgroup environments, you may need to enable classic mode authentication for network logons. To do this, open the **Local Security Policy** from the Control Panel and select **Administrative Tools**. Navigate to **Local Policies -> Security Options**, double-click **Network Access: Sharing and Security Model for local accounts** and set it to **classic**.

4. Modify the **WSMan trusted hosts** setting by adding the IP addresses of all remoting clients to the list of trusted hosts. Do this by using one of the following commands:

   a. `Set-item wsman:localhost\client\trustedhosts -value *` (adds all computers as trusted hosts).

   b. `Set-item wsman:localhost\client\trustedhosts -value Computer` (only adds Computer to the trusted hosts).

   c. `Set-item wsman:localhost\client\trustedhosts -value *.domain.com` (adds all computers in the specified domain).

   d. `Set-item wsman:localhost\client\trustedhosts -value 10.10.10.1` (adds the remote computer with the IP address 10.10.10.1 to the trusted hosts list).

5. To enable CredSSP authentication, follow the steps described in "SCVMM Security" on page 16.

6. To use Kerberos authentication, the client and server machine must be in the same domain.

Hyper-V Management Through SCVMM

- SCVMM provides a Hyper-V agent that must be installed on managed Hyper-V servers.

- Add Hyper-V servers into SCVMM using one of the following methods:

    - From the SCVMM Administrator console, as a host on an Active Directory domain or on a perimeter network

    - From PowerShell, using the Add-VMHost cmdlet

SCVMM Use Cases

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

1. As an SCVMM administrator I want a generic OO operation or flow so that I will be able to execute any SCVMM PowerShell cmdlets on a remote SCVMM server:

    - Run SCVMM Commands

2. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and provision virtual machines on Hyper-V servers:

    - Disable Virtual Machine Undo Disk

    - Discard Virtual Machine State

    - Get Virtual Machine

    - Move Virtual Machine

    - New Virtual Machine

    - Refresh Virtual Machine

    - Register Virtual Machine

    - Remove Virtual Machine

    - Repair Virtual Machine

    - Resume Virtual Machine

    - Save Virtual Machine State

    - Set Virtual Machine

    - Shut Down Virtual Machine

    - Start Virtual Machine

    - Stop Virtual Machine

- Store Virtual Machine

- Suspend Virtual Machine

3. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to deploy virtual machines from templates:

- Get Template

- New Template

- Remove Template

- Set Template

4. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and organize virtual disk drives:

- Compress Virtual Disk Drive

- Convert Virtual Disk Drive

- Expand Virtual Disk Drive

- Get Virtual Disk Drive

- New Virtual Disk Drive

- Remove Virtual Disk Drive

- Set Virtual Disk Drive

5. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and organize virtual DVD drives:

- Get Virtual DVD Drive

- New Virtual DVD Drive

- Remove Virtual DVD Drive

- Set Virtual DVD Drive

6. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and organize virtual hard disks:

- Get Virtual Hard Disk

- Move Virtual Hard Disk

- Remove Virtual Hard Disk

- Set Virtual Hard Disk

7. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and organize virtual networks:

- Get Virtual Network

- New Virtual Network

- Remove Virtual Network

- Set Virtual Network

8. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and organize virtual SCSI adapters:

  - Get Virtual SCSI Adapters

  - New Virtual SCSI Adapter

  - Remove Virtual SCSI Adapter

9. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage and organize virtual network adapters:

  - Get Virtual Network Adapters

  - New Virtual Network Adapters

  - Remove Virtual Network Adapters

  - Set Virtual Network Adapters

10. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to provision hardware profiles:

  - Get CPU Type

  - Get Hardware Profile

  - Get Operating System

  - New Hardware Profile

  - Remove Hardware Profile

  - Set Hardware Profile

11. As an SCVMM administrator, I want a set of OO operations and flows so that I will be able to manage jobs:

  - Get Job

  - Get Step

  - Restart Job

  - Stop Job

SCVMM — OO Architecture

System Center Virtual Machine Manager allows you to administer a set of virtual machine hosts using:

- Windows PowerShell

- SCVMM Administrator console

- Web-based Delegated Provisioning UI

The SCVMM integration uses the capabilities of PowerShell to remotely execute SCVMM-specific cmdlets.
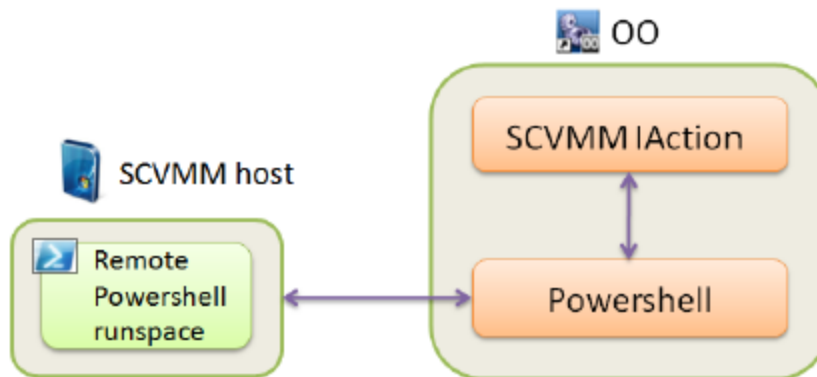
Location of SCVMM Integration Operations and Flows in OO Studio

The Microsoft SCVMM integration includes the following operations and flows in the **OO Studio Library/Integrations/Microsoft/System Center Virtual Machine Manager/** folder.

- Integrations
  - Amazon
  - BMC
  - Citrix XenServer
  - Computer Associates
  - Deprecated
  - F5
  - Hewlett-Packard
  - IBM
  - Linux KVM
  - Microsoft
    - Hyper-V
    - Microsoft Operations Manager
    - Opalis
    - System Center Configuration Manager
    - System Center Operations Manager
    - System Center Orchestrator
    - System Center Virtual Machine Manager
      - Deprecated
        - Remove Virtual Network
        - Set Virtual Network
      - Hardware Profile
        - Get CPU Type
        - Get Hardware Profile
        - Get Operating System
        - New Hardware Profile
        - Remove Hardware Profile
        - Set Hardware Profile
      - Jobs
        - Get Job
        - Get Step
        - Restart Job
        - Stop Job
      - Templates
        - Get Template
        - New Template
        - Remove Template
        - Set Template
      - Virtual Disk Drive
        - Compress Virtual Disk Drive
        - Convert Virtual Disk Drive
        - Expand Virtual Disk Drive
        - Get Virtual Disk Drive
        - New Virtual Disk Drive
        - Remove Virtual Disk Drive
        - Set Virtual Disk Drive
      - Virtual DVD Drive
        - Get Virtual DVD Drive
        - New Virtual DVD Drive
        - Remove Virtual DVD Drive
        - Set Virtual DVD Drive
      - Virtual Hard Disk
        - Get Virtual Hard Disk
        - Move Virtual Hard Disk
        - Remove Virtual Hard Disk
        - Set Virtual Hard Disk
      - Virtual Machine
        - Disable Virtual Machine Undo Disk
        - Discard Virtual Machine State
        - Get Virtual Machine
        - Move Virtual Machine
        - New Virtual Machine
        - Refresh Virtual Machine
        - Register Virtual Machine
        - Remove Virtual Machine
        - Repair Virtual Machine
        - Resume Virtual Machine
        - Save Virtual Machine State
        - Set Virtual Machine
        - Shut Down Virtual Machine
        - Start Virtual Machine
        - Stop Virtual Machine
        - Store Virtual Machine
        - Suspend Virtual Machine
      - Virtual Network
        - Get Virtual Network
        - New Virtual Network
        - Remove Virtual Network
        - Set Virtual Network
      - Virtual Network Adapter
        - Get Virtual Network Adapter
        - New Virtual Network Adapter
        - Remove Virtual Network Adapter
        - Set Virtual Network Adapter
      - Virtual SCSI Adapter
        - Get Virtual SCSI Adapter
        - New Virtual SCSI Adapter
        - Remove Virtual SCSI Adapter
      - Run SCVMM Commands

Chapter 3

Troubleshooting

This chapter includes:

Troubleshooting Overview

This section provides troubleshooting procedures and tools that you can use to solve problems you may encounter while using this integration. It also includes a list of the error messages you may receive while using the integration and offers descriptions and possible fixes for the errors.

General Troubleshooting Procedures and Tools

If a Microsoft SCVMM operation or flow fails unexpectedly, verify that you have properly applied the settings described in "Installing and Configuring the Integration" on page 8 in this document on the RAS host and on the SCVMM server host. Also check that the credential inputs provided in the flow are correct.

You can also verify that the SCVMM task you wanted to perform succeeds when executed in PowerShell by following the below steps:

1. Open the PowerShell console on the RAS host.

2. Create and use a new PowerShell session on the SCVMM server with the following commands:

   ```
   $s = New-PSSession <SCVMM_server_ip_or_hostname> -Credential
   <SCVMM_domain>\<SCVMM_user>

   Enter-PSSession $s
   ```

3. Do one of the following:

   - For SCVMM 2008R2, load the SCVMM PowerShell snap-in with the command below:

     ```
     Add-PSSnapin Microsoft.SystemCenter.VirtualMachineManager
     ```

   - For SCVMM 2012, import the SCVMM PowerShell module with the command below:

     ```
     Import-Module virtualmachinemanager
     ```

4. Connect to the Virtual Machine Manager server:

   ```
   Get-VMMServer <SCVMM_server_ip_or_hostname>
   ```

5. Once you are in the session and connected to the server, run the command that the OO flow or operation tried to execute and inspect the output.

Error Messages

This section lists the error messages you may receive while using this integration. Each error message includes possible causes and fixes for the error.

The following errors are thrown by the SCVMM content and indicate problems that prevent the execution of the PowerShell cmdlets which are intended to carry out the SCVMM tasks.

`Can not add snap-in to the current powershell session.`

The provided snap-in could not be loaded in the current Powershell session. A needed library might be missing.

`Can not connect to host.`

A connection to the host could not be established. Possible reasons might be: the host is unreachable, Powershell is not installed etc.

`Can not execute powershell command.`

The snap-in containing the needed command is not loaded or syntax of the command is not valid.

`You must provide a host in order to execute the operation.`

All the flows need a host input to be provided in order to be executed.

`Invalid value for authentication type.`

Only Default, Kerberos, CredSSP and Negotiate authentication types are supported.

Note: There are also a number of SCVMM specific errors that can occur when the OO SCVMM flows executes SCVMM cmdlets via PowerShell. An extensive list containing these errors and fixes for the 2008r2 version is available at http://social.technet.microsoft.com/wiki/contents/articles/virtual-machine-manager-vmm-2008-r2-error-codes.aspx. A list of errors and fixes for the 2012 version is available at http://social.technet.microsoft.com/wiki/contents/articles/4906.system-center-2012-virtual-machine-manager-vmm-error-codes.aspx.

Chapter 4

SCVMM Security

The OO integration flows and operations create a remote Windows PowerShell session on the target SCVMM computer. To successfully execute the commands, you must provide each user with credentials that have enough privileges and an authentication mechanism to authenticate the user on the remote host.

The operations and flows support the following authentication mechanisms:

- Default

- Negotiate

- Kerberos

- Credssp

Default and **Negotiate** work even if the RAS and SCVMM hosts are not in the same domain with default configuration if the given user has enough privileges to run PowerShell commands.

For **Kerberos** authentication, both the RAS and SCVMM machine should be in the same domain and should be able to access the domain controller.

The **Credential Security Support Provider** protocol (**CredSSP**) lets an application delegate the user's credentials from the client to the target server for remote authentication. The client is authenticated over the encrypted channel by using the Simple and Protected Negotiate (SPNEGO) protocol with either Microsoft Kerberos or Microsoft NTLM.

To enable CredSSP authentication

1. Server side steps:

   a. Set CredSSP authentication to **true** by using the `Enable-WSManCredSSP -Role Server` PowerShell command, or by using the `winrm set winrm/config/client/auth '@{CredSSP="true"}'` command line alternative.

   b. Create a new HTTPS listener by using the following command:

   ```
   winrm create winrm/config/Listener?Address=+Transport=HTTPS
   ```

   If you encounter the following error **Cannot create a WinRM listener on HTTPS because this machine does not have an appropriate certificate. To be used for SSL, a certificate must have a CN matching the hostname, be appropriate for Server Authentication, and not be expired, revoked, or self-signed.**, and all the properties are set correctly, you can try to give the exact path to your valid certificate using:

   ```
   winrm create winrm/config/Listener?Address=+Transport=HTTPS @
   {Host-
   name="-
   myhost";CertificateThumbprint="97ec43f84ec447f0d88de55bcf91227069680d2e"
   ```

where **myhost** is your actual hostname. **CertificateThumbprint** can be retrieved following these steps:

    i. Open the Microsoft Management Console (MMC) snap-in for certificates.

    ii. In the Console Root window's left pane, click **Certificates (Local Computer)**.

    iii. Click the **Personal > Certificates** folders to expand them.

    iv. In the list of certificates, note the **Intended Purposes** heading. Find a certificate that lists **Server Authentication** as an intended purpose and double-click the certificate.

    v. In the Certificate dialog box, click the **Details** tab, scroll through the list of fields, and then click **Thumbprint**. Copy the hexadecimal characters from the box. If this thumbprint is used in code for the X509FindType, remove the spaces between the hexadecimal numbers. For example, the thumbprint **a9 09 50 2d d8 2a e4 14 33 e6 f8 38 86 b0 0d 42 77 a3 2a 7b** should be specified as **a909502dd82ae41433e6f83886b00d4277a32a7b** in code.

2. Client side steps:

    a. Enable CredSSP authentication on the client, by running the command `Enable-WSManCredSSP -Role Client -DelegateComputer WSMAN/*`.

    b. Allow delegating fresh credentials by performing the following steps:

        i. Open **gpedit.msc** and go to **Computer Configuration > Administrative Templates > System > Credentials Delegation**.

        ii. Enable **Allow Delegating Fresh Credentials** and add the **wsman** hosts to the server list.

        iii. Run `gpupdate /force` from the command line to force policy update.

    c. Domain Controller side steps:

    If the NETWORK SERVICE does not have **Validated write to service principal name**, try running the following command: `dsacls "CN=AdminSDHolder,CN=System, DC=domain,DC=com" /G "S-1-5-20:WS;Validated write to service principal name"` or open ADUC, go to **Computers > DC object > Security**, select **Network Service**, and then give it **Validated write to SPN**.

Chapter 5

OO Tools You Can Use with the SCVMM Integration

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

- **Wget**

  Wget is a command-line tool that you can use to download and run flows from the Internet. You can download Wget from the **GNU Wget** Web page. Wget runs the flow you specify in the URL contained on the command line. It can use the HTTP, HTTPS, and FTP protocols.

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

- **WSCentralService SOAP API**

  Use the WSCentralService SOAP API to launch and control the execution of integration flows programmatically. This allows you to control the flow execution—including running, pausing, resuming, and canceling a flow, and viewing the status of a flow run.

  The WSCentralService SOAP API Java and .NET classes and interfaces are located in the OO SDK home directory, in the **lib/** folder. The certificates, keystore, WSDL, and sample code are located in the OO SDK home directory, in the **samples/** folder.