



Cisco UCS Director Management Guide for Microsoft System Center Virtual Machine Manager, Release 6.5

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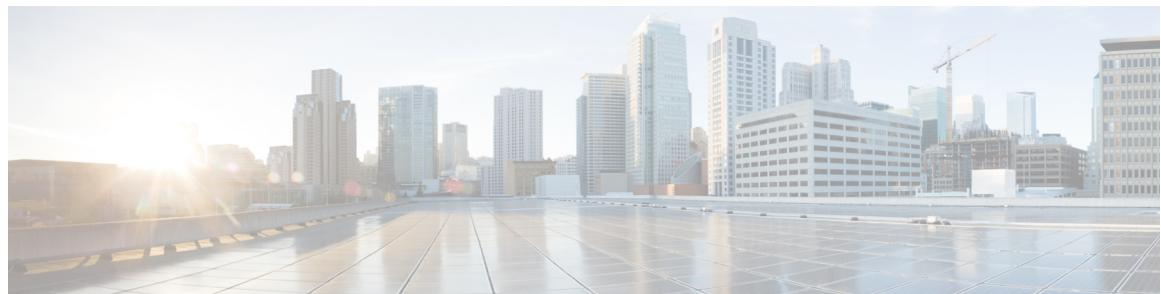
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Audience

This guide is intended primarily for data center administrators who use Cisco UCS Director and who have responsibilities and expertise in one or more of the following:

- Server administration
- Storage administration
- Network administration
- Network security
- Virtualization and virtual machines

Conventions

Text Type	Indication
GUI elements	GUI elements such as tab titles, area names, and field labels appear in this font . Main titles such as window, dialog box, and wizard titles appear in this font .
Document titles	Document titles appear in <i>this font</i> .
TUI elements	In a Text-based User Interface, text the system displays appears in <i>this font</i> .

Text Type	Indication
System output	Terminal sessions and information that the system displays appear in this font .
CLI commands	CLI command keywords appear in this font . Variables in a CLI command appear in <i>this font</i> .
[]	Elements in square brackets are optional.
{x y z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
<>	Nonprinting characters such as passwords are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

**Caution**

Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

**Tip**

Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

**Timesaver**

Means *the described action saves time*. You can save time by performing the action described in the paragraph.

**Warning**

IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

SAVE THESE INSTRUCTIONS

Related Documentation

Cisco UCS Director Documentation Roadmap

For a complete list of Cisco UCS Director documentation, see the *Cisco UCS Director Documentation Roadmap* available at the following URL: http://www.cisco.com/en/US/docs/unified_computing/ucs/ucs-director/doc-roadmap/b_UCSDirectorDocRoadmap.html.

Cisco UCS Documentation Roadmaps

For a complete list of all B-Series documentation, see the *Cisco UCS B-Series Servers Documentation Roadmap* available at the following URL: <http://www.cisco.com/go/unifiedcomputing/b-series-doc>.

For a complete list of all C-Series documentation, see the *Cisco UCS C-Series Servers Documentation Roadmap* available at the following URL: <http://www.cisco.com/go/unifiedcomputing/c-series-doc>.

**Note**

The *Cisco UCS B-Series Servers Documentation Roadmap* includes links to documentation for Cisco UCS Manager and Cisco UCS Central. The *Cisco UCS C-Series Servers Documentation Roadmap* includes links to documentation for Cisco Integrated Management Controller.

Documentation Feedback

To provide technical feedback on this document, or to report an error or omission, please send your comments to ucs-director-docfeedback@cisco.com. We appreciate your feedback.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see [What's New in Cisco Product Documentation](#).

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the [What's New in Cisco Product Documentation RSS feed](#). RSS feeds are a free service.



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CHAPTER

New and Changed Information for this Release

This chapter contains the following sections:

- [New and Changed Information for This Release, page 1](#)

New and Changed Information for This Release

The following table provides an overview of the significant changes to this guide for this current release. The table does not provide an exhaustive list of all changes made to this guide or of all new features in this release.

Table 1: New Features and Changed Behavior in Cisco UCS Director, Release 6.5

Feature	Description	Where Documented
Hot Add Memory	Microsoft SCVMM 2016 supports: <ul style="list-style-type: none">• Changing the Static Memory of a VM when it is in Power On state.• Hot add of Dynamic Memory. As a result, a VM can have its memory resource changed to a specific value even when the VM is in Power On state.	VM Memory, on page 42
Hot Add NIC	SCVMM 2016 introduces a Hot Add feature. You can add, edit, and delete NICs even when the VM is in a running state.	Adding a VM NIC, on page 47

New and Changed Information for This Release

Feature	Description	Where Documented
Memory Weight	Memory Weight is introduced as a parameter while provisioning a VM. A VM with a higher memory weight takes precedence over a VM with a lower memory weight.	Resizing Memory and CPU for a VM, on page 42



CHAPTER 2

Overview

This chapter contains the following sections:

- [About Microsoft System Center Virtual Machine Manager, page 3](#)
- [About Cisco UCS Director for SCVMM, page 4](#)

About Microsoft System Center Virtual Machine Manager

Microsoft System Center Virtual Machine Manager (SCVMM) 2012 SP1 is a comprehensive IT infrastructure, virtualization, and cloud management platform. With this platform, you can manage your applications and services across multiple hypervisors and across public, hosted, and private cloud infrastructures to deliver flexible and cost-effective IT services. Microsoft SCVMM allows you, as the administrator, to configure and manage the servers, the network, and the storage resources.

Microsoft SCVMM 2012 SP1 introduces the following constructs to model and configure the networks on the Hyper-V servers:

- Logical network—A logical network is used to organize and simplify network assignments for hosts, virtual machines, and services. As logical networks represent an abstraction of the underlying physical network infrastructure, they enable you to model the network based on business needs and connectivity properties.
- Network site—A network site (otherwise known as Logical Network Definitions) is used to define the VLANs and IP subnets that you want to associate with the logical network in each physical location and to control which hosts (in that location) may be configured to support it.
- VM network—VM Networks provide the (network) interface through which a virtual machine (VM) connects to a particular Logical Network.
- IP pool—An IP pool template is used to assign a range of IP addresses to the hosts and to the virtual machines that are running inside the Microsoft SCVMM-managed environment.
- Port profile—A port profile for uplinks (also called an uplink port profile) specifies which logical networks can connect through a particular physical network adapter. A port profile for virtual network adapters specifies capabilities for those adapters and makes it possible for you to control how bandwidth is used on the adapters. The capabilities include offload settings and security settings.

- Port classification—A port classification provides a global name for identifying different types of virtual network adapter port profiles. As a result, a classification can be used across multiple logical switches while the settings for the classification remain specific to each logical switch. For example, you can create one port classification that is named FAST to identify ports that are configured to have more bandwidth, and one port classification that is named SLOW to identify ports that are configured to have less bandwidth. You can use the port classifications that are provided in VMM, or you can create your own port classifications.
- Logical switch—A logical switch is a switch template which contains a set of parameters (for example, switch extensions, uplink port profiles, and port classifications) that you can use to create Hyper-V virtual switches on Windows Server 2012 host computers. A logical switch helps to configure a consistent network policy across many Hyper-V hosts.

About Cisco UCS Director for SCVMM

Cisco UCS Director supports the Microsoft System Center Virtual Machine Manager (SCVMM) environments listed in the [Cisco UCS Director Compatibility Matrix](#).

Cisco UCS Director is integrated with SCVMM through a Windows PowerShell. The PowerShell Agent acts as an interfacing layer between Cisco UCS Director and SCVMM. After you have installed and started the PowerShell Agent, you can manage SCVMM from Cisco UCS Director.

Cisco UCS Director enables you to perform basic SCVMM actions on a virtual machine (VM) such as power-on, power-off, adding disks, removing disks, VM provisioning, and so on. Also, you can manage Server Message Block (SMB) 3.0 file share, Hyper-V host clustered storage, and logical unit numbers (LUNs).

Cisco UCS Director supports the following network models that are defined based on the types of logical networks in SCVMM:

- 1 VLAN-based network model—Uses virtual local area network (VLAN) technology for isolating networks. Configure IP subnets for a site if Virtual Machine Manager (VMM) statically assigns IP addresses to VMs created within the site. If DHCP is present, no IP subnet configuration is required. You can manage the isolated networks as they are, and use SCVMM to simplify the management process.
- 2 Private VLAN-based network model—Private Virtual LANs (PVLANS) are often used by service providers to work around the scale limitations of VLANS. They essentially allow network administrators to divide a VLAN into several separate and isolated subnetworks which can then be allocated to individual customers (tenants). PVLANS share the IP subnet that was allocated to the parent VLAN. Hosts connected to different PVLANS still belong to the same IP subnet. They require a router to communicate with each other and to communicate with resources on any other network. The network sites within this logical network contain independent networks consisting of primary and secondary VLAN pairs in isolated mode.
- 3 Network virtualization-based model—Using this network model, you can support multiple tenants (also called as clients or customers). Each tenant is on their own network and isolated from the network of other tenants. With this isolation, your tenants can use any IP addresses that they want for their virtual machines, regardless of the IP addresses of other VM networks. Based on the specified limits, you can allow your tenants to configure some aspects of their own networks. Network virtualization abstracts the physical address space and presents a virtual address space to the tenant.

Cisco UCS Director includes orchestration features that allow you to automate configuration and management of Hyper-V in one or more workflows. A complete list of the Hyper-V orchestration tasks is available in the Workflow Designer, and in the Task Library. For more information about orchestration in Cisco UCS Director, see the [Cisco UCS Director Orchestration Guide](#).



CHAPTER 3

Managing SCVMM Infrastructure

This chapter contains the following sections:

- [SCVMM Integration, page 5](#)
- [Managing SCVMMs, page 7](#)

SCVMM Integration

To integrate SCVMM in Cisco UCS Director, perform the following actions:

- Install and configure the PowerShell agent (PSA).
- Add the PSA to Cisco UCS Director.
- Enable WinRM and WinRS on SCVMM and all SCVMM hosts.
- Make sure that the domain account used to connect SCVMM belongs to the local administrator group for SCVMM and SCVMM hosts.
- Ensure that a PowerShell Agent is added to the Hyper-V account when you create a Hyper-V account in Cisco UCS Director.

Configuring a PowerShell ExecutionPolicy Server

Step 1 Verify the current policy by executing Get-ExecutionPolicy cmdlet from the PowerShell command shell.

```
PS C:\Users\administrator\ Get-ExecutionPolicy Restricted
```

Note Make sure that you choose the correct policy type based on your infrastructure architecture. It is typically unrestricted.

Step 2 Type Set-ExecutionPolicy-ExecutionPolicy ExecutionPolicy unrestricted and press **Enter** to modify an existing execution policy.

```
PS C:\Users\administrator\ Set-ExecutionPolicy -ExecutionPolicy unrestricted
```

Enabling WinRM and WinRS

```

Execution Policy Change
The execution policy helps protect you from scripts that you do not trust.
Changing the execution policy might expose you to the security risks described in the about
_Execution_Policies help topic.
Do you want to change the execution policy?
[Y] Yes [N] No [S] Suspend [?] Help (default is "Y"): y

```

Enabling WinRM and WinRS

The PowerShell Agent executes cmdlets and scripts on the target server in a PowerShell remote session. To accept remote PowerShell commands, enable Windows Remote Management (WinRM), change the startup type to *Automatic*, create a "listener" to respond to WinRS commands, and start the service on each computer you want to work with. This provides connectivity to Windows Remote Shell (WinRS), the client side of WS-Management protocol.

To enable WinRM, run a configuration command. The command creates a "listener" and also opens an exception for WinRM in Windows Firewall.

Step 1 Open a command prompt, and enter the command:
winrm quickconfig

You receive the following output:

```
WinRM is not set up to allow remote access to this machine for management.
The following changes must be made:
```

```
Set the WinRM service type to delayed auto start.
Start the WinRM service.
Create a WinRM listener on HTTP:///* to accept WS-Man requests to any IP on this machine.
Enable the WinRM firewall exception.
Make these changes [y/n]?
```

Step 2 Enter **y**.
You receive the following output:

```
Make these changes [y/n]? y
```

```
WinRM has been updated for remote management.
```

```
WinRM service type changed successfully.
WinRM service started.
Created a WinRM listener on HTTP:///* to accept WS-Man requests to any IP on this machine.
WinRM firewall exception enabled.
```

Step 3 Verify that WinRM is enabled by executing the following command:
get-service winrm

Step 4 Configure the value " * " in the TrustedHosts table of WinRM by executing the following command:
winrm set winrm/config/client @{TrustedHosts="*"}

When you are working with computers in workgroups or home groups, either use HTTPS as the transport or add the remote machine to the TrustedHosts configuration settings to enable authentication.

Note Configuring WinRM over HTTP or HTTPS depends on the requirements of the specific environment. HTTPS is only necessary if a secure connection is required. For more details, see <https://blogs.technet.microsoft.com/meamcs/2012/02/24/how-to-force-winrm-to-listen-interfaces-over-https/>.

What to Do Next

Make sure that the domain account used for connecting to a target server belongs to the local administrator group.

Managing SCVMMs

In Cisco UCS Director, one SCVMM installation is considered as a cloud. Each cloud requires a unique name.

Step 1 Choose Administration > Virtual Accounts.

Step 2 Choose a virtual account to execute the following actions on the account:

Button Name	Description
View	Displays the cloud details.
Edit	Edits a cloud.
Delete	Deletes a cloud after confirmation.
Test Connectivity	Tests the connectivity of Cisco UCS Director to an SCVMM cloud.
Manage Tag	Adds a tag to the cloud, edits the assigned tag, and deletes the tag from the cloud. Note The tags that are assigned with the Taggable Entities as virtual accounts when you create a tag are displayed. For more information on the tag library, see Cisco UCS Director Administration Guide .
Report Metadata	Provides underlying information about how the data is formatted for the virtual accounts page.

Adding a Cloud

In Cisco UCS Director, one SCVMM installation is considered as a cloud. Each cloud requires a unique name.

Step 1 Choose **Administration > Virtual Accounts**.

Step 2 On the **Virtual Accounts** page, click **Add**.

Step 3 On **Add Cloud** page, select **Hyper-V** from the **Cloud Type** drop-down list.

Step 4 On the **Add Cloud** screen, complete the following fields:

Name	Description
Cloud Name field	The name of the cloud. All reports refer to the cloud using this cloud name. Note The following special characters are not allowed in a cloud name: ., \$,@.
Credential Policy Option	
User Credential Policy check box	Check this check box to use a policy to assign credentials to the account.
Credential Policy field	Choose the credential policy from the drop-down list. This field appears only when the User Credential Policy check box is checked. Complete the rest of the fields for this option.
PowerShell Agent drop-down list	Choose a PowerShell agent for Hyper-V. This field appears only when the User Credential Policy check box is unchecked.
Server Address field	The IP address of the SCVMM server.
Server User ID field	The user ID of the SCVMM server. This field appears only when the User Credential Policy check box is unchecked.
Server Password field	The password of the SCVMM server. This field appears only when the User Credential Policy check box is unchecked.
Domain field	The domain of the SCVMM server. This field appears only when the User Credential Policy check box is unchecked.
Description field	The description of the cloud.
Contact Email field	The email address that you can use to contact the administrator or other person responsible for this account.
Location field	The location of this account.

Name	Description
Pod drop-down list	Choose a pod to which this account belongs.
Service Provider field	(Optional) The name of the service provider associated with this account, if any.

- Step 5** Click Add.
-

What to Do Next

Test the connectivity to the cloud account.

Testing Cloud Connectivity

- Step 1** Choose Administration > Virtual Accounts.
- Step 2** On the Virtual Accounts page, choose an SCVMM cloud.
- Step 3** Click Test Connectivity.
- Review the message to verify the connection.
- Step 4** Click Close.
-

What to Do Next

Verify that the cloud and the cloud data are being collected.

Verifying Cloud Discovery

- Step 1** Choose Virtual > Compute.
- Step 2** On the Compute page, choose an SCVMM cloud. It may take a few minutes to complete automatic discovery and populate all the data. Cisco UCS Director displays a set of tabs that contain information about the components of the account that it has discovered. By default, the **Summary** tab appears. It provides the graphical view of cloud information in a dashboard format.
-

Viewing the Topology

You can view the topology of VM network, host network, and cluster network.

Step 1 Choose **Virtual > Compute**.

Step 2 On the **Compute** page, choose the cloud.

Step 3 To view the network connectivity of VMs, click **VMs** and do the following:

a) Choose a VM and click **View Details**.

b) Click **VM Network Connectivity**.

c) Choose the VM network connectivity and click **View Connectivity**.

The **VM Network Connectivity** screen is displayed with a view of the topology and connectivity of the devices in the VM.

d) If desired, you can modify the following view options:

- **View Mode** drop-down list—Adjusts the spacing and positioning of the devices. The mode determines which options are available for you to customize the topology view. You can choose between the following view modes:

◦ **Hierarchical**

◦ **Concentric**

◦ **Circular**

◦ **Force Directed**

• **Allow Item Spacing** check box—Increases the distance between devices for the Hierarchical view mode.

• **Distance** control—Adjusts the distance between devices for the Concentric view mode.

• **Radius** control—Changes the radius of the circle and therefore adjusts the distance between devices for the Circular view mode.

• **Rigidity** control—Adjusts the rigidity for the Force Directed view.

• **Force Distance** control—Adjusts the distance between devices for the Force Directed view.

e) Click **Close** to return to the **VM Network Connectivity** tab.

Step 4 To view the network connectivity of cluster network, click **Clusters** and do the following:

a) Choose a cluster and click **View Details**.

b) Click **Cluster Network Connectivity**.

c) Choose the network connectivity and click **View Connectivity**.

The **Cluster Network Connectivity** screen is displayed with a view of the topology and connectivity of the devices in the cluster network.

d) If desired, you can modify the following view options:

- **View Mode** drop-down list—Adjusts the spacing and positioning of the devices. The mode determines which options are available for you to customize the topology view. You can choose between the following view modes:

- **Hierarchical**

- **Concentric**

- **Circular**

- **Force Directed**

- **Allow Item Spacing** check box—Increases the distance between devices for the Hierarchical view mode.
- **Distance** control—Adjusts the distance between devices for the Concentric view mode.
- **Radius** control—Changes the radius of the circle and therefore adjusts the distance between devices for the Circular view mode.
- **Rigidity** control—Adjusts the rigidity for the Force Directed view.
- **Force Distance** control—Adjusts the distance between devices for the Force Directed view.

- e) Click **Close** to return to **Cluster Network Connectivity**.

Step 5

To view the network connectivity of host, click **Host Nodes** and do the following:

a) Choose a host node and click **View Details**.

b) Click **Host Network Topology**.

c) Choose the host network topology and click **View Connectivity**.

The **Cluster Network Connectivity** screen is displayed with a view of the topology and connectivity of the devices in the cluster network.

d) If desired, you can modify the following view options:

- **View Mode** drop-down list—Adjusts the spacing and positioning of the devices. The mode determines which options are available for you to customize the topology view. You can choose between the following view modes:

- **Hierarchical**

- **Concentric**

- **Circular**

- **Force Directed**

- **Allow Item Spacing** check box—Increases the distance between devices for the Hierarchical view mode.
- **Distance** control—Adjusts the distance between devices for the Concentric view mode.
- **Radius** control—Changes the radius of the circle and therefore adjusts the distance between devices for the Circular view mode.
- **Rigidity** control—Adjusts the rigidity for the Force Directed view.
- **Force Distance** control—Adjusts the distance between devices for the Force Directed view.

- e) Click **Close** to return to **Host Network Topology**.

Viewing the Topology



CHAPTER 4

Managing Policies

This chapter contains the following sections:

- [About Policies, page 13](#)
- [About Service Delivery, page 14](#)
- [Adding a Hyper-V Computing Policy, page 22](#)
- [Adding a Hyper-V Storage Policy, page 24](#)
- [Adding a Hyper-V Network Policy, page 26](#)

About Policies

Cisco UCS Director provides an End User Portal using which resources such as virtual machines (VMs) or bare metal servers, are provisioned from a pool of assigned resources using predefined policies set by administrators.

A policy is a set of rules that determines where and how a new virtual machine (VM) is provisioned within the infrastructure, based on the availability of system resources.

Cisco UCS Director requires that you set up the following policies to provision resources:

- [Adding a Hyper-V Computing Policy](#)
- [Adding a Hyper-V Storage Policy](#)
- [Adding a Hyper-V Network Policy](#)

In addition, there are service delivery policies for cost models, OS licenses, and Hyper-V system.



Important

Create a cloud account prior to setting up policies to provision VMs.

About Service Delivery

For SCVMM integration, you create the following service delivery information:

- Cost models
- OS licenses
- Hyper-V System policy

Choose **Policies > Virtual/Hypervisor Policies > Service Delivery** to perform these tasks.

Managing Cost Models

For simplified accounting, you can define a cost model. A group's infrastructure resources can be accounted for based on its cost model.

You combine the supported infrastructure resource costs (CPU, memory, storage, and network) with VM costs to determine the total cost of a VM lifecycle.

For a cost model, you can define the following costs:

- One-time provisioning cost
- Active and inactive VM costs
- Provisioned, reserved, and used CPU costs
- Provisioned, reserved, and used Memory costs
- Committed and uncommitted Storage costs
- Received, and transmitted Network Data costs

Adding a Cost Model

Step 1 Choose **Policies > Virtual/Hypervisor Policies > Service Delivery**.

Step 2 On the **Service Delivery** page, click **Cost Model**.

Step 3 Click **Add**.

Step 4 On the **Add Cost Model** screen, complete the following fields:

Name	Description
Cost Model Name field	The cost model name.
Cost Model Description field	The cost model description.
Cost Model Type drop-down list	Choose HyperV as the cost model type.

Name	Description
Charge Duration drop-down list	Choose the Hourly , Daily , Weekly , Monthly , or Yearly as the change frequency. Note The remaining fields in this dialog box are all defined on an hourly basis.
Virtual Machine Cost Parameters	
One Time Cost field	The fixed one-time cost for provisioning the VM.
Active VM Cost field	The hourly cost of a VM in the active state.
Inactive VM Cost drop-down list	The hourly cost of a VM in the inactive state.
CPU Charge Unit drop-down list	Choose the GHz or Cores as the CPU charge unit.
Provisioned CPU Cost field	The hourly provisioned CPU cost per CPU charge unit (GHz). The cost is applicable for active VMs.
Reserved CPU Cost field	The reserved CPU cost per CPU charge unit (GHz) per hour. The cost is applicable for active VMs only.
Used CPU Cost field	The hourly used CPU cost, based on actual CPU usage. The cost is applicable for active VMs. Note This cost does not include provisioned and reserved cost. If you enter a value in Used CPU Cost , leave the provisioned cost and reserved cost fields empty. If you have specified the provisioned cost and reserved cost, leave the used CPU cost empty.
Provisioned Memory Cost field	The hourly provisioned memory cost per GB. The cost is applicable for active VMs. Note The memory cost is calculated in the same manner as CPU cost.
Reserved Memory Cost field	The reserved memory cost per GB. The cost is applicable for active VMs only.
Used Memory Cost field	The hourly reserved memory cost per GB. The cost is applicable for active VMs.
Received Network Data Cost field	The received network data cost per GB. The cost is applicable for active VMs only.
Transmitted Network Data Cost field	The transmitted network data cost per GB. The cost is applicable for active VMs only.
Committed Storage Cost field	The hourly committed storage cost per GB for both the active and inactive VMs.
Uncommitted Storage Cost field	The hourly uncommitted (un-used but provisioned) storage cost per GB for both the active and inactive VMs.

Name	Description
Tag Based Cost Model drop-down list	Select a tag-based cost model. This list displays all the tag-based cost models that you have created.
Physical Server Cost Parameters	
One Time Cost field	The fixed one-time cost for provisioning the VM.
CPU Charge Unit drop-down list	Choose the GHz or Cores as the CPU charge unit.
Provisioned CPU Cost field	The hourly provisioned CPU cost per CPU charge unit (GHz). The cost is applicable for active VMs.
Used Memory Cost field	The hourly reserved memory cost per GB. The cost is applicable for active VMs.
Committed Storage Cost field	The hourly committed storage cost per GB for both the active and inactive VMs.
Full Length Blade Cost field	Cost of full length blade servers per hour. This cost is applicable for physical servers only.
Half Length Blade Cost field	Cost of half length blade servers per hour. This cost is applicable for physical servers only.

- Step 5** Click **Add**.
-

OS Licenses

Cisco UCS Director provides an option for users to add Windows OS licenses. These licenses are mapped to Windows images during the creation of a catalog. You have an option to provide the Windows OS license for a Windows image in Hyper-V System Policy or choose the key from the OS version field during catalog creation.

Adding OS License Details

- Step 1** Choose **Policies > Virtual/Hypervisor Policies > Service Delivery**.
Step 2 On the **Service Delivery** page, click **OS License**.
Step 3 Click **Add**.
Step 4 On the **Add License Details** screen, complete the following fields:

Name	Description
Windows Version Name field	The Windows version name.
License field	The Windows product ID/license key. Note Key Management Service (KMS) client setup keys are also accepted.
License Owner Name field	The name of the Windows license owner.
Organization field	The organization to be configured in the VM.
License Mode drop-down list	Choose Per-Seat or Per-Server as the license mode.
Number of licensed Users field	The number of licensed users or connections.

Step 5 Click Submit.

Hyper-V System Policy

The Hyper-V system policy defines system-specific information, such as the following:

- VM name template for the automatic creation of VM names
- Host name template
- VM image type
- OS license pool product ID
- Time zone for the deployment that uses the policy
- Domain and/or workgroup to be used for deployment with this policy

Adding a Hyper-V System Policy

Step 1 Choose Policies > Virtual/Hypervisor Policies > Service Delivery.

Step 2 On the Service Delivery page, click **HyperV System Policy**.

Step 3 Click Add.

Step 4 On the **Add Policy** screen, complete the following fields:

Name	Description
Policy Name field	The name for the Hyper-V deployment policy.

Name	Description
Policy Description field	The description of the Hyper-V deployment policy.
Power On after deploy check box	Check if you want all VMs deployed using this policy to be automatically powered on.
VM Name Template field	<p>The VM name template for generating VM names, declared in the format \${VARIABLE}. For example: vm-\${GROUP_NAME}-SR\${SR_ID}.</p> <p>The following variable names are permitted:</p> <ul style="list-style-type: none"> • CLOUD_NAME—The name of the cloud that is being deployed. • GROUP_NAME—The name of the group the VM belongs to. • CATALOG_NAME—The name of the catalog item or entry. • USER—The requesting user ID. • SR_ID—The service request ID. • COMMENTS—The requesting user's comments. • PROFILE_NAME—The name of the policy. • LOCATION—The name of the location, as specified during cloud creation. • UNIQUE_ID—A random-ID that makes the name unique. • APPCODE—The application code value specified during catalog creation. • COST_CENTER—The cost center a group or customer organization is associated with that is specified during group or customer organization creation. <p>Note You can append the # character to the VM Name Template to create a unique index number for the VM Name. It can be specified in multiples. For example, if the VM name template is vm-\${GROUP_NAME}##, the VM Name is vm-ABCD01 for the first VM provisioned with this policy (the group name is ABCD and 01 represents ##).</p>
Disable VM Name Uniqueness Check check box	<p>Check to disable the VM name uniqueness check when the VM is provisioned. Disabling the VM name uniqueness check allows you to disable the VM name validation across Cisco UCS Director and use the same VM name in a multi-tenant, multi-domain, and multi-workgroup environment.</p> <p>If this field is unchecked, the VM name uniqueness check runs and only allows the same VM name if it is provisioned in a different tenant, domain, or workgroup.</p>
Recycle VM Name check box	By default, decommissioned VM names that were previously provisioned are used when creating a new VM. Uncheck if you do not want to recycle previously used VM names.

Name	Description
End User VM Name or VM Prefix check box	Check if you want to add the VM prefix specified by the end user in the custom specification page of the service request during VM provisioning.
Host Name Template field	<p>The host name template for generating host names, declared in the format \${VARIABLE}. For example: host-\${GROUP_NAME}-SR\${SR_ID}.</p> <p>The following variable names are permitted:</p> <ul style="list-style-type: none"> • CLOUD_NAME—The name of the cloud that is being deployed. • GROUP_NAME—The name of the group the VM belongs to. • CATALOG_NAME—The name of the catalog item or entry. • USER—The requesting user ID. • SR_ID—The service request ID. • COMMENTS—The requesting user's comments. • PROFILE_NAME—The name of the policy. • LOCATION—The name of the location, as specified during cloud creation. • UNIQUE_ID—A random-ID that makes the name unique. • APPCODE—The application code value specified during catalog creation. • COST_CENTER—The cost center a group or customer organization is associated with that is specified during group or customer organization creation. <p>Note The # character can be appended to the Host Name Template to create a unique index number for the Host Name. It can be specified in multiples.</p> <p>Note Hostname is limited to 15 characters and must compliance with Windows NetBIOS limitations. This limitation is applicable for both Windows and Linux VMs.</p>
Disable Host Name Uniqueness Check check box	<p>Check to disable the host name uniqueness check when the VM is provisioned with guest OS customizations.</p> <p>Disabling the host name uniqueness check allows you to disable the host name validation across Cisco UCS Director and use the same host name in a multi-tenant, multi-domain, and multi-workgroup environment.</p> <p>If this field is unchecked, the host name uniqueness check runs and only allows the same host name if the VM is going to be provisioned in a different tenant, domain, or workgroup.</p>
Recycle Host Name check box	By default, host names from a decommissioned VM that was previously provisioned are used when creating a new host. Uncheck if you do not want to recycle previously used host names.

Name	Description
End User Host Name or Host Prefix check box	Check if you want to add the host prefix specified by the end user in the custom specification page of the service request during host provisioning.
Time Zone drop-down list	Choose the Time Zone for VMs using this policy.
GUI Run Once Commands field	The command to execute inside the VM after the VMs using this policy are provisioned. For example: cmd.exe/c md c:\newfolder.
VM Image Type drop-down list	By default, Windows and Linux appears as the VM image type. If you choose Linux Only , a new Add Policy dialog box appears. For a Linux only VM image, complete the required fields.
Linux Parameters	
Root Password field	The root password of the Linux machine.
DNS Domain Name field	The name of the DNS domain.
Windows Parameters	
Product ID field	The Windows product ID or license key. Note If this value does not match the value in your OS License Pool, that value overrides the key provided here.
Username	The non-default local username for Windows 7,8,10 Operating Systems
Administrator Password field	The administrator password for the template.
Organization Name field	The organization name to be configured with the VM operating system.
Full Name field	The full name of the organization.
Domain/Workgroup drop-down list	Choose either Workgroup or Domain . If you choose Domain , complete the required fields.
Workgroup field	The workgroup name.

Step 5

For a **Linux Only** VM image, complete the following fields:

Name	Description
Policy Name field	The name for the Hyper-V deployment policy.
Policy Description field	The description of the Hyper-V deployment policy.

Name	Description
Power On after deploy check box	Check this check box if you want VMs to be automatically powered on after deployment.
VM Name Template field	The VM name template.
Host Name Template field	The host name template.
Time Zone drop-down list	Choose the Time Zone for VMs using this policy.
GUI Run Once Commands field	The command to execute inside the VM after the VMs using this policy are provisioned. For example: cmd.exe/cd c:\newfolder.
VM Image Type drop-down list	Choose Linux Only .
Root Password field	The root password of the Linux machine.
DNS Domain Name field	The name of the DNS domain.

Step 6 When you choose **Domain**, complete the following fields:

Name	Description
Domain field	The domain name.
Domain Username field	The domain user name. The format of the user name is domain\username.
Domain Password field	The domain password.

Step 7 Click **Submit**.

Adding a Hyper-V Computing Policy

Step 1 Choose **Policies > Virtual/Hypervisor Policies > Computing**.

Step 2 On the **Computing** page, click **HyperV Computing Policy**.

Step 3 Choose a VM.

Step 4 Click **Add**.

Step 5 On the **Add Policy** screen, complete the following fields.

Note Fields may vary depending on the version of SCVMM cloud selected.

Name	Description
Policy Name field	The policy name.
Policy Description field	The policy description.
Cloud Name drop-down list	Choose the cloud name.
Host Node/Cluster Scope drop-down list	If you want to narrow the scope of the host node, choose another option. The default is All .
Selected Host Nodes field	This field appears when you choose to include or exclude hosts in the Host Node/Cluster Scope drop-down list. Click Select and choose host nodes to include or exclude.
Associate SCVMM Cloud drop-down list	Changes the resource allocation, based on SCVMM cloud selected.
Allow Migration to Different CPU Type check box	Check this check box to allow migration of the provisioned VM to a different CPU type. Leave unchecked if you want to disallow migration.
Enable High Availability check box	Check this check box to enable high availability. Note This option is required to deploy a VM on cluster resources. Make sure to select the cluster CSVs (cluster shared volume) in the storage policy and the common virtual switch available to the cluster.
Filter Conditions check boxes	Check the conditions that apply. Any hosts that do not meet these criteria are excluded. For each selected Minimum Condition , choose the Boolean operators and enter the condition value in the respective text field. Note If more than one condition is selected, all selected conditions must match.
Deployment Options	

Name	Description
Override Template check box	Check this check box if you want to override the template properties during deployment. If checked, complete the required fields. See the next step for more information about the specific fields.
Resizing Options	
Allow Resizing of VM check box	Check this check box if you want to allow VMs to be resized before or after provisioning. If checked, complete the required fields.

Step 6 To override the template, complete the following fields:

Name	Description
Number of vCPUs	Enter the number of vCPUs.
Enable Dynamic Memory check box	Check this check box to enable dynamic memory.
Memory (MB) field	The memory to be allocated.
Memory Weight field	Specify how to prioritize the availability of memory for this VM compared to other virtual machines. The memory values can range from 0 to 10000, with 10000 being the higher precedence. Note Specifying a lower setting for this VM may prevent it from starting when other VMs are running and available memory is low.

Step 7 To allow VM resizing, complete the following fields:

Name	Description
Permitted values for vCPUs field	The permitted individual values for vCPUs. Maximum allowed vCPU count is 64
Permitted values for Memory in MB field	The permitted individual values for memory (MB) Specify the available memory values as a comma-separated list. For example: 512,768,1024
Permitted values for Startup Memory field	The permitted individual values for startup memory (MB) Specify the available memory values as a comma-separated list. For example: 512,768,1024

Name	Description
Permitted values for Maximum Memory in MB field	The permitted individual values for maximum memory (MB) Specify the available memory values as a comma-separated list. For example: 512,768,1024
Permitted values for Memory Buffer (%) field	The permitted individual values for the memory buffer (percentages) Specify the available memory values as a comma-separated list. For example: 10,25,50
Permitted values for Memory Weight field	Specify the memory weight values as a comma-separated list (range between 0 and 10000). For example: 500,1000,8000

- Step 8** Click **Submit**.
-

Adding a Hyper-V Storage Policy

Step 1 Choose **Policies > Virtual/Hypervisor Policies > Storage**.

Step 2 On the **Storage** page, click **HyperV Storage Policy**.

Step 3 Choose a VM.

Step 4 Click **Add**.

Step 5 On the **Add Policy** screen, complete the following fields.

Note Fields may vary depending on the version of SCVMM cloud selected.

Name	Description
Policy Name field	The storage policy name.
Policy Description field	The storage policy description.
Cloud Name drop-down list	Choose the SCVMM cloud name.
Scope	
Data Stores Scope drop-down list	If you want to narrow the scope of the data stores, choose another option. The default is All .

Name	Description
Selected Data Stores	This field appears when you choose to include or exclude data store in the Data Stores Scope drop-down list. Click Select and choose data stores to include or exclude.
Use CSV check box	Check this check box if you want to use CSV. Note Using CSV is mandatory if deploying the VM on cluster resources.
Storage Options	
Use Local Storage check box	Check this check box if you want to use local storage.
Use SAN check box	Check this check box if you want to use storage area network (SAN).
Use SMB check box	Check this check box if you want to use server message block (SMB).
Filter Conditions check boxes	Check the conditions that apply. Any data stores that do not meet these criteria are excluded. For each selected Filter Condition , choose the boolean operators and enter the condition value in the respective text field. Note If more than one condition is selected, all selected conditions must match.
Deployment Options	
Override Template check box	Check this check box if you want to override the template properties during deployment. If checked, complete the required fields.
Use Dynamic Provisioning check box	Check this check box to enable dynamic memory. This field appears when you check the Override Template check box.
Custom Disk Size (GB) field	The custom disk size to be allocated. This field appears when you check the Override Template check box.
Resizing Options for VM Lifecycle	
Allow Resizing of Disk check box	Check this check box to allow disk to be resized during the disk lifecycle.
Permitted Values for Disk in GB field	The permitted values for disk in GB. This field appears when you check the Allow Resizing of Disk check box.
Allow user to select datastores from scope check box	Check this check box to allow users to select datastores from scope.

Step 6 Click **Submit**.

Adding a Hyper-V Network Policy

The network policy enables virtual network types to be defined and made available on host nodes.

You can also specify the following:

- Adapter types to assign for provisioned VMs
- Enablement of VLAN
- Extension of the policy to cover multiple vNICs

Step 1 Choose **Policies > Virtual/Hypervisor Policies > Network**.

Step 2 On the **Network** page, click **HyperV Networking Policy**.

Step 3 Choose a VM.

Step 4 Click **Add**.

Step 5 On the **Network Policy Information** screen, complete the following fields.

Name	Description
Policy Name field	The policy name.
Policy Description field	The policy description.
Cloud Name drop-down list	Choose the cloud name.
Allow end user to select optional NICs check box	Check this check box to select optional NICs.
VM NIC(s) field	The list of VM NICs that are added to the network policy. Click the + icon to add a VM NIC.

Step 6 To add a VM NIC to the network policy, on the **Add Entry to VM NICs** screen, complete the following fields:

Name	Description
NIC Alias field	The name of the NIC alias of the VM network.
Mandatory check box	This check box is enabled when you check the Allow end user to select optional NICs check box. If you want to make the NIC alias as mandatory, check this check box.

Name	Description
Allow end user to choose VM Networks check box	Check this check box to choose VM networks during VM provisioning.
Adapter Type drop-down list	Choose SYNTHETIC or EMULATED as the adapter type.
VM Networks field	The list of VM networks that are added to the NIC alias. Click the + icon to add a VM network.

Step 7 To add a VM network to the network policy, on the **Add Entry to VM Networks** screen, complete the following fields:

Name	Description
Network Name field	Click check box and choose a network.
Subnet drop-down list	Choose a subnet from the drop-down list. This field appears when you choose an external network or a virtualization-based VM network.
VLAN ID drop-down list	Choose a VLAN ID from the drop-down list. This field appears when you choose virtualization-based network without isolation.
Enable MAC Spoofing check box	Check this check box to enable changing of a factory-assigned MAC address on a NIC.
Use DHCP check box	Check this check box to use the DHCP server to assign dynamic IP addresses to devices on a network
Static IP Pool drop-down list	Choose the static IP pool from a list of IP pools in SCVMM. This field appears when the Use DHCP check box is unchecked.
Port Classification drop-down list	(Optional) Choose a port classification from the list of port classifications displayed based on the selected network.

Step 8 Click **Submit**.



CHAPTER 5

Managing Virtual Data Centers

This chapter contains the following sections:

- [Virtual Data Centers, page 29](#)

Virtual Data Centers

A Virtual Data Center (VDC) is a logical grouping that combines virtual resources, operational details, rules, and policies to manage specific group requirements.

A group or organization can manage multiple VDCs, images, templates, and policies. Organizations can allocate quotas and assign resource limits for individual groups at the VDC level.

You can also define approvers specific to a VDC. The approvers assigned to a particular VDC must approve all service requests from users for VM provisioning.



Note

There is a default VDC in Cisco UCS Director, and all discovered VMs are part of this default VDC. Discovered VMs are VMs that are created outside of Cisco UCS Director or were already created on VMware vCenter before Cisco UCS Director was installed. Cisco UCS Director automatically discovers such VMs and adds them to the default VDC.

A VM that is provisioned using a service request can be associated with a specific VDC. When you create a service request, you can choose the VDC on which this VM is provisioned. You can view a list of the VDCs that are available for a particular group and choose the required VDC when provisioning VMs.

Adding a Virtual Data Center

When completing a service request for VM provisioning, users can view a list of available vDCs for a particular group, and select the appropriate vDC.

A VM provisioned using a service request is associated with the vDC.

Step 1

Choose **Policies > Virtual/Hypervisor Policies > Virtual Data Centers**.

Step 2

Click **Add**.

Step 3

On the **Add vDC** screen, complete the following fields:

Name	Description
Account Type drop-down list	Choose HyperV and click Submit .
General Information	
vDC Name field	The vDC name.
vDC Locked check box	Check this check box if you want to lock this vDC. If checked, this vDC cannot be used for any further deployments. Actions on existing VMs in the vDC are disabled.
vDC Description field	The vDC description.
Group drop-down list	Choose a group for which this vDC is being created, or click the + icon to add a new group to the selection list.
Cloud Name drop-down list	Choose a cloud (SCVMM account) on which you wan to create the VDC.
Approvers and Contacts	
First Approver Username field	(Optional) The first approver of the service request created using this vDC.
Second Approver Username field	(Optional) The second approver of the service request created using this vDC.
Approval required from all the users check box	Check this check box if the approval is required from all the users of the vDC.
Number of Approval Request reminders field	The number of reminder emails to be sent to the approvers. Note Enter 0 to send reminder emails periodically until the request is approved or rejected.
Reminder Intervals (Hours) field	The number of reminder emails to be sent to the approvers.
Provider Support Email Address field	The contact user's email address. This user is notified about VM provisioning in this vDC.
Copy Notifications to Email Address field	(Optional) The secondary contact user's email address. This user is notified about VM provisioning in this vDC.
Policies	
Computing Policy drop-down list	Choose a Hyper-V computing policy for the vDC.

Name	Description
Network Policy drop-down list	Choose a Hyper-V network policy for the vDC.
Storage Policy drop-down list	Choose a Hyper-V storage policy for the vDC.
System Policy drop-down list	Choose a Hyper-V system policy for the vDC.
Cost Model drop-down list	Choose a cost model for the vDC.
Disable displaying cost in the SR summary and email page check box	Check this check box to avoid displaying the cost model in the service request summary and email page.
User Action drop-down list	Choose a user action policy for the vDC.
VM Management Policy drop-down list	Choose a VM Management policy for the vDC.
End User Self-Service Policy drop-down list	Choose an end user self-service policy for the vDC.

Step 4 Click **Add**.



CHAPTER 6

Publishing Catalogs

This chapter contains the following sections:

- [About Catalogs, page 33](#)
- [Creating a Catalog, page 34](#)

About Catalogs

You can self-provision virtual machines (VMs) using predefined catalog items. A catalog defines parameters, such as the cloud name and the group name to which the VM is bound. Only a system administrator can create a catalog.

To aid in managing catalogs, Cisco UCS Director allows you to group similar catalogs within a folder. While creating a catalog, you can choose to add it in a previously created folder, or create a new folder. A folder is visible in the system only when it contains a catalog.

The Standard, Advanced, Service Container, and Bare Metal folders are available by default. You cannot edit or delete them.

- **Standard**—Used to create catalogs for VM provisioning, using images from a list of clouds.
- **Advanced**—Used to publish orchestration workflows, such as catalog items.
- **Service Container**—Used to publish application containers as catalog items.
- **Bare Metal**—Used to create catalogs for bare metal server provisioning.

The Manage Folder option on the Catalog page allows you to edit a folder name, delete a folder, or re-order the list of folders.



Important

If you have upgraded Cisco UCS Director to the latest version, then all catalogs created in prior versions are grouped into the folders available by default, based on the catalog type.

Creating a Catalog

When you add a catalog, you can select the groups permitted to provision new VMs with it, and provide other basic information. The chosen application category determines which policies the vDC applies when the service is provided.

For Windows images, there are options for VM user credential access. User credentials for the VM in a template can be shared with other users, or reset before sharing. If shared, a user can retrieve credentials for the active VM.

Step 1 Choose **Policies > Catalogs**.

Step 2 Click **Add**.

Step 3 On the **Add Catalog** screen, choose **Standard** from the **Catalog Type** drop-down list.

Step 4 Click **Submit**.

Step 5 On the **Basic Information** screen, complete the required fields, including the following:

Name	Description
Catalog Name field	Enter a name for the catalog. Note After created, a catalog name cannot be modified.
Catalog Description field	Enter a description of the catalog.
Catalog Type drop-down list	Displays the type of catalog you previously chose. To change the catalog type, you need to cancel and restart this procedure.
Catalog Icon drop-down list	Choose from a list of icons to associate this catalog with an image. This icon is seen when you are creating a service request using this catalog.
Applied to all groups check box	Check the box to enable all groups to use this catalog. Leave it unchecked to deny its use to other groups.
Support Contact Email Address field	Enter the email address of the support contact who is notified when a service request is created using this catalog item.
Selected Groups list	Expand the list to choose the boxes for included groups. The checked groups use this catalog to provision new VMs. Click Validate to verify the selection.
Publish to end users check box	By default, this box is checked. Uncheck this box if you do not want this catalog to be visible to users. If you do not uncheck this box, then this catalog is visible to the users of the system.

Name	Description
Cloud Name drop-down list	Choose the cloud with the image for VM provisioning.
Image list	Choose the type of image (any existing templates such as Windows, Linux, and other files that make up the image) that is applied when VMs are provisioned using this catalog and click Select .
Select Folder drop-down list	Choose the folder within which this catalog must be created. To create a custom folder name, click the + icon.
Configure Service Request Support Email check box	Check this box to enable the user to set the support email for sending service request status.

Step 6 Click Next.

Step 7 On the **Application Details** screen, complete the following fields:

Name	Description
Category list	Expand the list to choose a VDC category. Click Validate to verify selection.
Override check box	Check the box to enable the user to override the selected category while provisioning a VM using a service request.
Specify OS drop-down list	Choose the type of OS installed on the VM when it is provisioned.
Specify Other OS field	Enter an OS that is not available in the Specify OS drop-down list.
Specify Applications check boxes	Check the appropriate boxes to specify applications that are installed on the VM during provisioning.
Specify Other Applications field	Enter other applications that are not available from the Specify Applications check boxes.

Name	Description
Application Code field	<p>Enter an application code that is used in the VM name.</p> <p>The application code can be between 1 to 4 characters (for example: W2K3, DB, WS). The application code can be used in a system policy for the VM name by using the variable \${APPCODE}.</p> <p>For example, if the VM Name Template is vm-\${GROUP_NAME}-\${APPCODE}, the VM provisioned with the system policy has the name vm-groupname-W2K3.</p>

Step 8

Click **Next**.

Step 9

On the **User Credentials** screen, complete the following fields (Windows image only):

Name	Description
Credential Options drop-down list	<p>Choose to allow or disallow users to retrieve VM access credentials.</p> <p>If sharing is chosen, enter the user ID and password.</p> <p>The Do not share option is chosen if the administrator wants to send the credentials privately to another user outside Cisco UCS Director</p> <p>Note For Windows 7 templates, the administrator has to provide the user ID because of rules on SCVMM guest customization.</p>

Step 10

Click **Next**.

Step 11

On the **Customization** screen, complete the following fields:

Name	Description
Automatic Guest Customization	
Enable check box	<p>Check this check box if you want to enable automatic guest customization. For Windows images, this option is enabled by default.</p> <p>If you do not check this check box, then Cisco UCS Director does not configure the DNS, Network, and Guest OS properties.</p> <p>Note This option is disabled for Linux templates.</p>
Post-Provisioning Custom Actions	
Enable check box	Check this check box if you want to enable a postprovisioning orchestration workflow.
Workflow drop-down list	<p>Choose a defined workflow for provisioning.</p> <p>Note This field appears when Post Provisioning Custom Actions Enable is checked.</p>

Name	Description
Cost Computation	
Charge Duration drop-down list	Choose Hourly or Monthly .
Active VM Application Cost USD field	Enter the cost for the application that is included in the template.
Inactive VM Application Cost USD field	Enter the cost to this catalog of a VM in inactive state, per hour or month.
VM Life Cycle Configuration	
Lease Time check box	Check the box to define a lease time (in days and hours).
Days field	Enter the number of days. Note This field appears when Lease Time is checked.
Hours field	Enter the number of hours. Note This field appears when Lease Time is checked.
Hide end user lease configuration check box	Check the box to prevent service users from configuring a lease time for VMs.
Hide end user VM provision later check box	Check the box to prevent service users from provisioning VMs at a later time.

Step 12 Click Next.

Step 13 On the VM Access screen, complete the following fields:

Name	Description
Web Access Configuration	
Enable check box	Check this check box if you want to enable web access to the VM.
URL field	Enter the URL of the VM. This field appears when you check the Web Access Configuration Enable check box.
Label field	Enter the label for the VM. This field appears when you check the Web Access Configuration Enable check box.
Remote Desktop Access Configuration	

Name	Description
Enable check box	Check this check box if you want to enable remote desktop access to the VM.
Server field	Enter the IP address of the server for remote access. This field appears when you check the Remote Desktop Access Configuration Enable check box.
Port field	Enter the port number of the server for remote access. This field appears when you check the Remote Desktop Access Configuration Enable check box.
Label field	Enter any label for this remote type of remote access. This field appears when you check the Enable check box.

Step 14 Click **Next**.

Step 15 On the **Summary** screen, review the information and make any necessary changes.

Step 16 Click **Submit**.



Managing the VM Lifecycle

This chapter contains the following sections:

- [Managing the VM Lifecycle, page 39](#)
- [Managing VM Power, page 41](#)
- [VM Memory, page 42](#)
- [Resizing Memory and CPU for a VM, page 42](#)
- [Enabling the Resize VM Feature, page 44](#)
- [Resizing a VM Disk, page 45](#)
- [Managing VM Snapshots, page 45](#)
- [Adding a VM NIC, page 47](#)

Managing the VM Lifecycle

You can perform post-provisioning lifecycle management actions on virtual machines (VMs).

These actions are broadly classified into four categories:

- VM power management—Power on, power off, pause, resume, shutdown guest, standby, reset, and reboot a VM.
- VM resizing—Resize a VM and resize a VM disk.
- VM snapshot management—Create a snapshot, revert a snapshot, mark a snapshot as golden, delete a snapshot, and delete all snapshots.

- Other VM actions—Create a VM disk, delete a VM disk, repair a VM, add a vNIC, delete a vNIC, save the state of a VM, discard the saved state of a VM, view the VM details, stack view of a VM, assign a VM, assign VM credentials, launch a VM client, and request for inventory collection.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 Click the row with the VM that you want to manage and click one of the following options:
Some of these options are available only from the **More Actions** drop-down list.

- **View Details**
- **Manage Tags**
- **Add Tags**
- **Delete Tags**
- **Assign VM**
- **Configure Lease Time**
- **Stack View**
- **Access VM Credentials**
- **Launch VM Client**
- **Power OFF**
- **Pause**
- **Create Snapshot**
- **Inventory Collection Request for VM**
- **Save State**
- **Reset**
- **Shutdown Guest**
- **Clone**
- **Delete Snapshot**
- **Delete All Snapshots**
- **Mark Golden Snapshot**
- **Revert Snapshot**
- **Resize VM**
- **Power ON**

You can also click **Stack View**, and **View Details** to access trend reports and details about service requests, VM action requests, events, VM snapshots, vNICs, disks, and linked clone VMs.

Managing VM Power

You can manage the power functions on VM that includes actions such as power on, power off, suspend power, reset, or reboot the VM.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 From the drop-down icon at the top right corner of the VMs table, choose an action.
The following actions appear according to the power state of the VM.

Action	Description
Power On	Powers on the VM.
Power Off	Power off the VM.
Suspend	Places the VM in a suspended state.
Shutdown Guest	Shuts down the Guest OS on the VM.
Reset	Performs a hard reset of the VM.

Step 5 On the **VM Task** screen, choose an action and complete the following fields:

Name	Description
VM Name field	Displays the name of the VM selected.
Task field	Displays the selected power management task.
Comments field	Enter comments if necessary.
Schedule Action radio button	Click one of the following options: <ul style="list-style-type: none">• Execute Now—Applies the action on the VM immediately.• Execute Later—Applies the action on the VM at the specified date and time.

Step 6 Click **Proceed**.

VM Memory

You can configure the VM memory to one of the following:

Static Memory

Static memory allows you to allocate a fixed amount of memory to the VM.

SCVMM 2016 supports changing the static memory of a VM when it is in **Power On** state. This feature is also known as **Hot Add**. It allows you to resize the VM memory without incurring any downtime as you can make the change while the VM is running.

Dynamic Memory

Dynamic memory allows you to specify a range and a buffer percentage from the resource pool. This feature dynamically adjusts the amount of memory allocated to the VM, in response to changes in the amount of memory required by the workloads or applications running in the virtual machine.

Microsoft SCVMM 2012 and 2016 support **Hot add/remove** of dynamic memory, also known as Runtime Memory Resize. With hot add/remove, a VM can have its memory resource changed to a specific value even when the VM is in **Power On** state. This works for both generation 1 and generation 2 virtual machines, running Windows Server 2012, Windows Server 2016, or Windows 10.

In addition, **Memory Weight** is introduced as a parameter while provisioning a VM. Almost any host server has some VMs that are more important than others. Hyper-V lets you prioritize them so that memory is allocated to the higher priority VMs first during a physical memory shortage. You can prioritize a VM's need for dynamic memory by adjusting its memory weight. VMs with a higher memory weight take precedence over VMs with lower memory weights. The memory values can range from 0 to 10000 (both included), with 10000 being the higher precedence.

Resizing Memory and CPU for a VM

Before You Begin

Make sure that you have a Windows 10, Windows Server 2012, or Windows Server 2016 running.

During resizing of memory:

-
- Step 1** Choose **Virtual > Compute**.
 - Step 2** Expand **All Clouds** and choose an SCVMM cloud.
 - Step 3** Click **VMs**.
 - Step 4** Choose the VM that you want to resize.
 - Step 5** From the **More Actions** drop-down list, choose **Resize VM**.
If the **Resize VM** option is not in the list, see [Enabling the Resize VM Feature, on page 44](#).
 - Step 6** On the **Resize VM** screen, complete the following fields:

Name	Description
VM Name	Displays the name of the VM.
Current Allocated CPU	Displays the current CPU on the VM.
Dynamic Memory	If status is: <ul style="list-style-type: none"> • Disabled—VM uses Static memory. • Enabled—VM uses Dynamic Memory.
Current Allocated Memory (GB)	Displays the current memory on the VM.
Current Allocated Memory Weight	Displays the memory weight allocated to the VM.
New CPU Count	Select the new CPU count from the drop-down list. This field cannot be changed when the VM is in the On state.
Static Memory — Changing the static memory of a VM when it is powered on is supported only in SCVMM 2016.	
New Memory	Choose the new memory allocation for the VM. This field is not available on Windows Server 2012 unless the VM is powered off.
New Memory Weight	Enter a value between 0 to 10000. Zero is the lowest precedence and 10000 is the highest. A lower value for this VM prevents it from starting when other VMs are running and available memory is low. This field cannot be changed when the VM is in the On state.
Dynamic Memory — To change from Static to Dynamic memory, you must first power off the VM. When you check Enable Dynamic Memory , the next three fields appear.	
New Startup Memory	Choose the amount of memory required to start the virtual machine. This field cannot be changed if the VM is in the On state.
New Maximum Memory (MB)	Choose the maximum amount of memory that the VM is allowed to use. The value can be as low as the value for Startup Memory to as high as one TB. However, a virtual machine can use only as much memory as the maximum amount supported by the guest operating system.
New Memory Buffer(%)	Choose the memory buffer allocation, specified as a percentage of New Maximum Memory. This is the memory Hyper-V attempts to assign to the VM, compared to the amount of memory needed by the applications and services running inside it.

Name	Description
New Memory Weight	Enter a value between 0 to 10000. Zero is the lowest precedence and 10000 is the highest. A lower value for this VM prevents it from starting when other VMs are running and available memory is low.
Current CPU Cost (currency: USD)	CPU cost per hour. This cost is calculated automatically and is based on CPU charge per unit (GHz/Core). This field is display only.
Current Memory Cost (currency: USD)	Memory cost per hour. This cost is calculated automatically and is based on maximum memory being used. This field is display only.
New CPU Cost (currency: USD)	CPU cost per hour. This cost is calculated automatically and is based on CPU charge pre unit (GHz/Core). This field is display only.
New Memory Cost (currency: USD)	Displays the updated memory cost per hour when dynamic memory is enabled. Click Compute New Memory Cost to update the memory cost based on the changes made earlier. This field is display only.

Step 7 Click **Resize**.

Enabling the Resize VM Feature

Step 1 Choose **Policies > Virtual/Hypervisor Policies > Computing**.

Step 2 On the **Computing** page, click **HyperV Computing Policy**.

Step 3 Choose the VM you want to edit.

Step 4 Click **Edit**.

Note The VM must be powered off before you proceed further.

Step 5 On the **Modify Policy** screen, under **Resizing Options**, check **Allow Resizing of VM**.

Step 6 Click **Submit**.

Resizing a VM Disk

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 Choose the VM that you want to resize.

Note The VM must be in the power off status. If the VM is in the on status, turn off the power of the VM using the **Power Off** action.

Step 5 From the **More Actions** drop-down list, choose **VM Disk Resize**.

Step 6 In the **Resize VM Disk** dialog box, complete the following fields:

Name	Description
VM Name field	The name of the VM.
Select Disk drop-down list	Choose the disk to resize.
Total Provisioned (GB) field	The total provisioned disk size in gigabytes.
New Size(GB) field	The new disk size in gigabytes.

Step 7 Click **Resize**.

Managing VM Snapshots

You can do the following VM snapshot actions:

- Create a snapshot
- Revert a snapshot
- Delete a snapshot
- Delete all snapshots
- Mark a snapshot as golden



Note You can manage the snapshot of the VM that is in the power on state.

For a selected VM on the **VMs** screen, choose the following actions from the **More Actions** drop-down list:

Name	Description
Create Snapshot	Creates a snapshot with a name and description.
Revert Snapshot	Reverts back to the most recent snapshot of a VM, thereby bringing the VM back on line. If the VM crashes or malfunctions, you can revert back to the most recent snapshot. You can also select a specific snapshot to revert back to, if there is more than one snapshot.
Mark Golden	Marks a snapshot as golden. Marking a snapshot as golden prevents it from being accidentally deleted. The only way to delete a golden snapshot is to unmark the golden snapshot (returning it to a standard snapshot).
Delete Snapshot	Deletes a snapshot.
Delete all Snapshots	Deletes all snapshots for this VM. You can delete all of your snapshots unless a golden snapshot is present. You have to unmark the golden snapshot first before being able to delete all of your snapshots.

Creating a VM Snapshot

You can create a snapshot of a VM at any point in time. You can later choose to revert to this snapshot or delete it.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 From the **More Actions** drop-down list, choose **Create Snapshot**.

Step 5 On the **Create Virtual Machine Snapshot** screen, complete the following fields:

Name	Description
Snapshot Name field	Name for the VM snapshot.
Snapshot Description field	Description of the VM snapshot.

Step 6 Click **Proceed**.

Marking a Snapshot as Golden

You can mark a snapshot as golden to prevent it from being accidentally deleted. The only way to delete a golden snapshot is to unmark the golden snapshot (returning it to a standard snapshot).

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 From the **More Actions** drop-down list, choose **Mark Golden Snapshot**.

Step 5 On the **Mark Golden Snapshot** screen, complete the following fields:

Name	Description
Snapshot table	Choose a snapshot from the list of snapshots created for the VM.
Mark As Golden Snapshot check box	Check this check box to designate the snapshot as a golden snapshot.

Step 6 Click **Proceed**.

Adding a VM NIC

Before You Begin

Ensure that a network policy is assigned to the VM network. Turn off the power on the VM if the SCVMM version is 2012 or older.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click the **VMs** tab.

Step 4 Choose a VM to configure with NIC.

Step 5 From the **More Actions** drop-down list, choose **Add NICs**.

Step 6 On the **Add VM NICs** screen, complete the following fields:

Name	Description
Adapter Type drop-down list.	By default, this is set as SYNTHETIC type. Choose Synthetic or Emulated. The network adapters are used to connect the virtual machines to internal networks, or to external networks after the virtual machines are deployed on a host. Synthetic network adapters provide better performance than emulated network adapters. Emulated network adapters are available on all virtualization software platforms and allow virtual machines to be connected to virtual networks.
Enable MAC Spoofing check box	Check the box to enable MAC spoofing.
VM Networks field	Click the + icon to select a network to which you are adding the VM NIC. Note An error message appears if the VM is not part of a network policy.
Subnet field	Click the + icon to select a Subnet to which you are adding the VM NIC.
Use DHCP check box	By default, the box is checked because when we add a NIC to the VM, the IP address are not assigned from a static IP pool. This is due to limitations within the SCVMM.
Port Classification drop-down list	(Optional) Choose a port classification from the list. Provides global names used to identify different types of virtual network adapter port profiles. The port classification settings remain specific to each logical switch, even if they can be used across multiple logical switches.

Step 7 Click **Submit**.

Assigning a VM

You can assign a VM to a group or vDC, and modify the VM category if needed. The provisioning time, termination time, and VM label can also be assigned.

Step 1 Choose **Virtual > Compute**.

Step 2 On **Compute** page, choose an SCVMM cloud.

Step 3 Click the **VMs**.

Step 4 Click the row with the VM that you want to assign to a group.

Step 5 From the **More Actions** drop-down list, choose **Assign VM**.

Step 6 In the **Assign VM** screen, complete the following fields:

Name	Description
VM Name field	The name of the VM (non-editable).
VM Ownership field	Choose a Group or a single User to assign the VM.
User Group field	This field appears when you select Group under VM Ownership. Choose a user group from the list. Click Validate to confirm the user group. Note Only the groups with valid vDC can be selected.
User field	This field appears when you select User under VM Ownership. Choose a user from the list. Note The user list appears only when the group allows resource assignment for users.
vDC drop-down list	Choose a virtual data center (vDC).
Category drop-down list	Choose a category of the VM.
VM User Label field	VM user label, if necessary.
Set Provision Time check box	Check this check box if you want to set the provisioning time. If checked, continue to Step 6.
Provision Date/Time field	Set the date and time to provision the VM.
Comments field	Enter the comments.

Step 7 Click **Assign**.

Creating a VM Disk

You can create a new VM disk for a selected VM. The disk can be either new, or created from an existing hard disk in the library.



Note This option is available only when the VM is in **Power Off** state.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 Click the row to select a VM for which you want to create a new disk.

Step 5 From the **More Actions** drop-down list, choose **Create VM Disk**.

Step 6 On the **Create VM Disk** screen, complete the following fields:

Name	Description
VM Name field	The name of the VM (non-editable).
Enter Disk Name field	The name of the disk.
Disk drop-down list	You can choose between the following: <ul style="list-style-type: none"> • Create a new virtual hard disk • Use an existing virtual hard disk
Select SCSI Controller drop-down list	Choose a channel and logical unit number (LUN) to which you want to add the disk.
Choose Hard Disk field	This field appears when you choose to use an existing virtual hard disk. Choose a hard disk from which you want to create a VM disk. Click Validate and click Compute New Disk Cost .
Select disk type drop-down list	This field appears when you choose to create a new virtual hard disk. Choose Dynamic or Fixed as the disk type.
Disk Size (GB) field	The size of disk in gigabytes. Maximum size can be up to 2TB. This field appears when you choose to create a new virtual hard disk. Click Compute New Disk Cost .

Step 7 Click **Create**.

Cloning a VM

Cloning a VM makes a copy of an existing VM in order to make a new VM with similar qualities. Cloning saves you time by keeping the parameters that you want from the VM that you are cloning. The new name given to the clone is defined in the system policy.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 Click the row with the VM that you want to clone.

Step 5 From the **More Actions** drop-down list, choose **Clone**.

Step 6 On the **Clone VM** screen, select the group on which you want the VM deployed from the **Select Groups** field.

Step 7 Click **Validate**.

Step 8 Click **Next**.

Step 9 On the **Customization Options** screen, complete the following fields:

Name	Description
Category field	Click Select to view a list of VDC categories. Select a category and click Select .
Post Provisioning Customs Actions check box	Click Enable to attach a workflow. The Workflow drop-down list appears with a list of work flows to choose from. The chosen workflow initiates when the provisioning starts.
VM App Charge Frequency drop-down list	Choose Hourly or Monthly .
Active VM Application Cost field	The cost for the application that is included in the template.
Inactive VM Application Cost field	The cost to this catalog of a VM in inactive state per hour or month.

Step 10 Click **Next**.

Step 11 On the **Deployment Configuration** screen, complete the following fields:

Name	Description
Select VDC drop-down list	Choose a VDC containing the policies you want for the VM.
VM Name or VM Prefix field	The VM name or prefix.
Comment field	Optionally, enter a description of the VDC.

Name	Description
Provision drop-down list	Choose Now to provision the VDC now or choose Later to provision the VDC at a later time. If you choose Later , then fields to specify the date and time appear.
Lease Time check box	Check the check box to configure a lease expiration time.

Step 12 Click **Next**.

Step 13 On the **Custom Specification** screen, complete the following fields:

Name	Description
CPU Cores drop-down list	Choose the CPU cores for the VM being provisioned.
Enable Dynamic Memory check box	Check to provision the VM with dynamically allocated memory. You can specify custom memory parameters in the Startup Memory , Maximum Memory , and Memory Buffer , drop-down lists.
Memory drop-down list	Choose the amount of memory for the VM being provisioned.
MemoryWeight drop-down list	Specify how to prioritize the availability of memory for this VM compared to other VMs on this computer.

Step 14 Click **Next**.

Step 15 On the **Custom Workflow** screen, if applicable, complete the required fields.

Note Custom workflow inputs apply if the catalog chosen for VM provisioning has Post Provisioning Custom Actions enabled.

Step 16 Click **Next**.

Step 17 On the **Select VM Networks** screen, if applicable, click the **VM Networks** pencil icon to edit a VM network.

Note The **Select VM Networks** screen is empty unless the **Allow end user to select optional NICs** check box is chosen in the network policy.

Step 18 On the **Select** screen, choose one or more clouds that you want associated with the VM.

Step 19 Click **Submit**.

Step 20 If you checked the **Perform deployment assessment** check box, then review the report of the assessment displayed in the **Deployment Assessment** pane.

If this assessment report identifies errors, then return to the previous panes and rectify the errors before submitting the request. If the assessment report shows no errors, then click **Next**.

Step 21 On the **Select Datastores** screen, if applicable, click **Select** in the **Select Datastore** field to select one or more datastores to associate with the VM.

Note This option is only available if **Allow user to select datastore from scope** is checked in the storage policy. The datastore choices that are available depend upon the storage policy that is associated to the VM's VDC.

- Step 22** Click Next.
- Step 23** Review the cloned VM information in the **Summary** panel.
- Step 24** Click Submit.
-

Managing vNICs

SCVMM 2016 introduces **Hot Add vNIC** feature. It allows you to add/edit/delete of NICs even when the VM is in running state.

You can add a NIC to a VM, as well as edit, replace, and delete a NIC. The network policy that is mapped to the vDC determines the available options for a NIC.

However, this feature is not supported if the guest OS is running a pre Windows 10 version or CentOS operating system.



Note The VM must be powered off to perform NIC actions if the SCVMM version is 2012 or older. If the VM is in the on state, turn off the power of the selected VM using the **Power Off** action.

Adding a VM NIC

Before You Begin

Ensure that the VM is powered off to perform VM NICs actions. If the VM is in the on state, turn off the power of the VM using the **Power Off** action.

-
- Step 1** Choose **Virtual > Compute**.
- Step 2** Expand **All Clouds** and choose an SCVMM cloud.
- Step 3** Click **VMs**.
- Step 4** Click the row with the VM to which you want to add a VM NIC.
- Step 5** From the **More Actions** drop-down list, choose **Add NIC**.
- Step 6** In the **Add VM NIC** screen, complete the following fields:

Name	Description
Adapter Type drop-down list	Choose Synthetic or Emulated. The network adapters are used to connect the virtual machines to internal networks, or to external networks after the virtual machines are deployed on a host. Synthetic network adapters provide better performance than emulated network adapters. Emulated network adapters are available on all virtualization software platforms and allow virtual machines to be connected to virtual networks.
VM Network table	Network to which you are adding the VM NIC.

Name	Description
Subnet field	Subnet to which you are adding the VM NIC.
Use DHCP check box	By default, DHCP is enabled. Uncheck to disable DHCP.
Port Classification field	Provides global names used to identify different types of virtual network adapter port profiles. The port classification settings remain specific to each logical switch, even if they can be used across multiple logical switches.

Step 7 Click **Submit**.

Step 8 Click **OK**.

Editing a VM NIC

Before You Begin

Ensure that the VM is powered off to perform VM NICs actions if the SCVMM version is 2012 or older. If the VM is in the on state, turn off the power of the VM using the **Power Off** action.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand **All Clouds** and choose an SCVMM cloud.

Step 3 Click **VMs**.

Step 4 Click the row with the VM that you want to configure.

Step 5 From the **More Actions** drop-down list, choose **Edit NIC**.

Step 6 In the **Edit VM NIC** screen, make the necessary changes.

Step 7 Click **Submit**.

Step 8 Click **OK**.



CHAPTER 8

Orchestration Workflow Operations

This chapter contains the following sections:

- [Automation with Orchestration, page 55](#)
- [Navigating to a Predefined Orchestration Workflow, page 57](#)
- [Validating and Executing an Orchestration Workflow, page 57](#)
- [Adding a Trigger, page 58](#)

Automation with Orchestration

Cisco UCS Director includes orchestration features that allow you to automate the configuration and management of tasks performed by SCVMM through a set of simple, predefined workflows. The same workflow can include Hyper-V VM, Hyper-V host, network, and storage tasks.

For more information about orchestration in Cisco UCS Director, see the [Cisco UCS Director Orchestration Guide](#).

Tasks

A task is a single action or operation with inputs and outputs (except in rare cases where the task operation does not require inputs or outputs). A task cannot be decomposed into smaller operations.

Cisco UCS Director has a task library containing hundreds of predefined tasks that cover most of the actions an administrator must perform using Orchestration. In cases where there is no suitable predefined task, you can create custom tasks.

Workflows for SCVMM

A workflow is a series of tasks arranged to automate a complex operation. The simplest possible workflow contains a single task, but workflows can contain any number of tasks.

Workflows are the heart of the Cisco UCS Director Orchestrator. They enable you to automate processes of any level of complexity on your physical and virtual infrastructure.

You build workflows using the Workflow Designer that has a drag-and-drop interface. In the Workflow Designer, you arrange tasks in sequence and define inputs and outputs to those tasks. Outputs from earlier tasks are available to use as inputs to any subsequent task.

Location of Orchestration Tasks

A complete list of the orchestration tasks is available in Workflow Designer, in the Task Library, and the **Virtualization** folder. The Task Library, which includes a description of the orchestration tasks, can be accessed from the following locations in Cisco UCS Director:

- **Orchestration > Workflows**
- http://IP_address/app/cloudmgr/onlinedocs/clouopiaTaskLib.html where *IP_address* is the IP address of Cisco UCS Director.

Types of Orchestration Tasks

The Hyper-V orchestration tasks include tasks to configure and manage the following:

- VM
- Host
- Virtual network
- Logical network
- Logical network definition
- Host network adapter
- Virtual network adapter
- PNIC
- Storage
- Logical unit network (LUN)
- Logical switch
- Standard switch
- Uplink port profile
- Storage classification
- File share
- Storage logical unit
- Storage provider

Accessing Task Documentation

-
- Step 1** Choose **Orchestration**.
- Step 2** On the **Orchestration** page, click **Workflows**.
- Step 3** From the **More Actions** drop-down list, select **Task Library**.
- Step 4** On the **Task Library** screen, check the **Regenerate document** check box to view a list of all new tasks and those by open automation.
- Step 5** Click **Submit**.
The orchestration task library appears. Click an entry to see more information about specific inputs and outputs that are available.
-

Navigating to a Predefined Orchestration Workflow

You build workflows using the Workflow Designer that has a drag-and-drop interface. In the Workflow Designer, you arrange tasks in sequence and define inputs and outputs to those tasks. Outputs from earlier tasks are available to use as inputs to any subsequent task.

Follow the steps listed to access Workflow Designer and create workflows from individual tasks.

-
- Step 1** Choose **Orchestration**.
- Step 2** On the **Orchestration** page, click **Workflows**.
- Step 3** On the **WorkFlows** screen, expand the workflow folder to see the available workflows.
- Step 4** Select the workflow you want to execute and from the **More Actions** drop-down list, click **Execute Now**.
- Step 5** To edit a workflow, follow the steps listed:
- Select the workflow you want to edit and from the **More Actions** drop-down list, click **Workflow Designer**.
 - On the Workflow Designer page, expand the **Virtualization Tasks > HyperV Tasks** folder.
 - Choose a required task and drag-and-drop the selected task in the **Workflow Designer** pane to add the task to the workflow.
- Provide the basic information, user input mapping, input, and user output mapping of the workflow task.
- If you want to modify a predefined workflow, we recommend that you first create a copy of that workflow.
-

Validating and Executing an Orchestration Workflow

Cisco UCS Director Orchestrator provides a mechanism for validating the flow of data from one task to the next in a workflow. Workflow validation checks the data bindings and connections between tasks. Orchestrator

Adding a Trigger

supplies a wizard-based issue resolver. When you validate a workflow, the wizard presents a list of issues along with suggestions for fixing those issues. Some issues require additional information or input from you. Other issues are quick fixes that are resolved for you.

-
- Step 1** Choose **Orchestration**.
- Step 2** On the **Orchestration** page, click **Workflows**.
- Step 3** Click the workflow you want to validate.
- Step 4** From the **More Actions** drop-down list, select **Validate**.
The Workflow Validation screen shows "This workflow is valid" message.
If there are any errors a description of the error, task details, and the required resolution is provided. Select the row for the error you want to resolve, click edit, and complete the remaining screens in the **Problem Detected** wizard.
- Step 5** After validating the workflow, from the **More Actions** drop-down list, select **Execute Now** to activate the orchestration workflow.
- Step 6** On the **Executing Workflow** screen, complete the fields and click **Submit**.
-

Adding a Trigger

Triggers are used to execute workflows based on specified conditions. Once those conditions are met, a workflow is automatically executed.

-
- Step 1** Choose **Orchestration**.
- Step 2** On the **Orchestration** page, click **Triggers**.
- Step 3** Click **Add**.
- Step 4** On the **Add Trigger** screen, complete the following field:

Name	Description
Trigger Name field	The name of the trigger.
Is Enabled check box	Check this check box to enable the trigger.
Description field	The description of trigger.
Frequency drop-down list	Choose the frequency at which the trigger rule is verified.
Trigger Type drop-down list	Choose one of the following as the trigger type: <ul style="list-style-type: none"> • Stateful—Executes the action only when there is a change in the state of the trigger. • Stateless—Executes the trigger condition at a frequency provided in the frequency field irrespective of the trigger state.

Step 5 Click Next.

Step 6 On the **Specify Conditions** screen, complete the following fields:

Name	Description
Conditions field	<p>Click the + icon to add a condition.</p> <p>In the Add Entry To Conditions dialog box, complete the following fields:</p> <ul style="list-style-type: none"> • Types of Objects to Monitor drop-down list—Choose Hyper V Host as the type of object to be monitored. • Object drop-down list—Choose a Hyper-V host to monitor. • Parameter drop-down list—Choose one of the following parameters: <ul style="list-style-type: none"> • CPU Usage % (Last Day Avg) • CPU Usage % (Last Hour Avg) • Memory Usage % (Last Day Avg) • Memory Usage % (Last Hour Avg) • Power Status • Operation drop-down list—Choose an operator from the list of operators that appear according to the selected parameter. • Value drop-down list—Choose a value from the list of values that appear according to the selected parameter.
Trigger When drop-down list	<p>Choose one of the following conditions: Any Condition(s) Satisfied or trigger type:</p> <ul style="list-style-type: none"> • All Condition(s) Satisfied—To trigger the workflow only when all set conditions are met. • Any Condition(s) Satisfied—To trigger the workflow if any one of the set conditions is met.

Step 7 Click Next.

Step 8 On the **Specify Workflow** screen, complete the following fields:

Name	Description
Maximum Invocations field	The number of times that the trigger is invoked.
(When Trigger State Becomes Active) Select Workflow drop-down list	Choose the workflow to be executed when the trigger is activated.
(When Trigger State Become Clear) Select Workflow drop-down list	This field is optional. Choose the workflow to be executed when the trigger is cleared.

Step 9 Click **Next**.

Step 10 On the **Specify Workflow Inputs** screen, provide the input for the selected workflows.

Step 11 Click **Submit**.



Monitoring and Reports

This chapter contains the following sections:

- [Monitoring and Reporting, page 61](#)
- [Summary Reports, page 61](#)
- [Tabular Reports, page 63](#)
- [Cloudsense Reports, page 69](#)

Monitoring and Reporting

Cisco UCS Director provides several different kinds of reports that you can use to view the status of an SCVMM cloud and its components. All of these reports can be manually refreshed for real-time data and exported to PDF, CSV, or XLS format for you to share with others.

The available reports include:

- Summary reports for comparison data and other information about the components of SCVMM cloud. These reports display in bar, pie, and tabular chart widgets on [Summary](#) pages.
You can add some or all of these reports to your Cisco UCS Director dashboard for quick access.
- Tabular reports for detailed information about specific components.
- More reports include Top 5 reports and other reports for detailed information about high-performing resources. You can select the report type to display as tabular, trending, or instant. You can customize some of these reports by choosing the report widget and time duration.

Summary Reports

Summary reports enable you to view and monitor the virtual infrastructure and system resources by displaying Bar and Pie graphs to provide comparisons, such as active vs. inactive VMs, provisioned vs. capacity CPU, and so on. These reports help you understand system details and provide insight into how the system is performing.

Viewing the Summary Report

You can customize your **Summary** pages to hide one or more reports. You can export the content of these reports in PDF, CSV, or XLS format. You can also add some or all of these reports to your Cisco UCS Director dashboard for quick access.

Viewing the Summary Report

The summary page displays a wide array of Tabular, Graphical, and Map reports to help the administrator manage system inventory. These reports are helpful for performing lifecycle actions on the inventory.

The administrator can configure settings to display only the required information for a given item. Each report is displayed as a widget, and can be hidden by customizing.

Step 1 Choose **Virtual > Compute**.

Step 2 Expand the Clouds and choose the SCVMM cloud.

On the Summary screen, you can view the various tabular and graphical summaries for the following:

Report	Description
Overview	Displays the cloud types, last status message, last polled time, server IP address, product name, product version, total VMs, and active VMs.
New VMs	Displays the new VMs for today, last 24 hours, and last hour.
Deleted VMs	Displays the deleted VMs for today, last 24 hours, and last hour.
VMs Active vs. Inactive	Displays the number of active and inactive VMs in the cloud.
Trend: Snapshot File Size	Displays the snapshot file size in the last 24 hours, week, or month.
Memory	Displays the total memory capacity, provisioned, and reserved.
CPU	Displays the total CPU capacity, provisioned, and reserved.
Disk	Displays the total disk capacity, provisioned, and reserved.
Trend: Number of VMs	Displays the number of total and active VMs in the last 24 hours, week, or month.
Trend: VM Additions & Deletions	Displays the VMs added and deleted in the last 24 hours, week, or month.
Trend: Number of Host Nodes	Displays the total nodes, active nodes, and total CPU sockets.

Report	Description
Number of Events by Severity	Displays the number of minor, major, and critical events in the last 24 hours, week, or month.

Tabular Reports

Tabular reports provide the status of the components in an SCVMM cloud. You can export the data from any tabular report in PDF, CSV, or XLS format. If you have scheduled inventory collection, the status is updated regularly. Otherwise, you can click **Refresh** on the tabular report to get real-time status.

You can access tabular reports from any page after you choose the SCVMM cloud. Following reports are available:

- Compute reports
- Storage reports
- Network reports

For some components, you can click a row in the tabular report and access more detailed information through **View Details**.

Monitoring Inventory

The cloud dashboard displays complete SCVMM cloud-level infrastructure information. You can monitor inventory using this dashboard. There are various tabs you can view for a selected cloud.



Note

Remember to always click **Refresh** to see all updates to the physical infrastructure.

Step 1

Choose **Virtual > Compute**.

Step 2

Expand the clouds and choose the SCVMM cloud.

You can view the following inventory information:

Tab	Description
Polling	<p>Displays the start time, collection type, status, message, and end time. The polling interval depends upon the cloud polling interval set in administration system parameters.</p> <p>You can also click Request Inventory Collection to view an on-demand inventory.</p>

Tab	Description
vDCs	<p>Displays information about the vDCs associated with the account, including the group, type, lock state, total VMs, active VMs, number of custom categories, status, and tag. The catalog item can become invalid when image, template, approver, or policies used in the catalog no longer exist.</p> <p>Clicking View Details that appears when you choose a vDC provides additional information of vDC. The additional information includes summary, VMs, events, static IP assignment (Static IP assignment is not applicable for Hyper-V), deleted VMs, VM action requests, vDC compliance on VMs, and more reports.</p>
VM Action Requests	<p>Displays the VM ID, action ID, user name, comments, and scheduled time of the action requests.</p>
Events	<p>Displays information about all events related to the account, including severity, event time, user, event ID, event type, event code, description, instance name, host name, VM type, and parent node.</p>
VMs	<p>Displays the list of VMs in the account. Provides actions to assign VM to users and user group, configure lease time, stack view, access VM credentials, and launch VM client.</p> <p>Clicking View Details that appears when you choose a VM provides additional information of VM. The additional information includes details, service request details, snapshots, VM action requests, events, disks, vNICs, VM network connectivity, and more reports.</p>
Clusters	<p>Displays the information of clusters that include the cluster name, total memory (GB), effective memory (GB), total CPU (GHz), effective CPU (GHz), CPU cores, effective hosts, hosts, validation status, and host group.</p> <p>Clicking View Details that appears when you choose a cluster provides additional information of cluster. The additional information includes summary, host node, cluster shared volumes, file shares, available storage, virtual switches, VMs, events, cluster network connectivity, and service request details.</p>

Tab	Description
Host Nodes	<p>Displays the host node, cluster name, product name, product version, host OS, host OS version, active VMs, total VMs, power status, VMRC state, PRO state, and host group of the cloud, and the SCVMM cloud to which it is assigned.</p> <p>Clicking View Details that appears when you choose a host node provides additional information of host node. The additional information includes summary, service requests, VMs, events, deleted VMs, host volumes, file shares, physical disks report, host network topology, and more reports.</p>
Deleted VMs	<p>Displays the details of the deleted VMs. When you choose a VM and click View Details, you get deleted VM details, service request details, snapshots, VM action requests, events, disks, vNICs, VM network connectivity, and more reports.</p>
Images	<p>Displays the image name, parent node, guest OS, integration services, memory (MB), number of CPUs, and last updated time.</p> <p>Note Administrators can provision new VMs from these images.</p> <p>Choose an image and click View Details to view the disk and vNICs details of the image.</p>
Library Servers	<p>Displays a list of library servers in the cloud.</p> <p>Choose a library server and click View Details to view the information about stored VMs, stored disks, ISOs, and library shares of the library server.</p>
Host Groups	<p>Displays the host group, account, parent host group, root status, inherit network settings, and the SCVMM cloud to which it is assigned.</p> <p>Choose a host group and click View Details to view the summary, logical units, storage pools, MAC address pools, logical network definitions, and service request details of the host group.</p>
Jobs	<p>Displays the history for the SCVMM jobs queue in the last 2 hours.</p>
Run As Accounts	<p>Displays the credentials that a user enters for any process as a Run As account. A Run As account is a container for a set of stored credentials.</p>

Viewing the Storage Report

Tab	Description
Custom Resources	Displays a list of custom resource package which is simply a folder in the SCVMM library with a .cr extension. This folder contains all the files required by your script, and the script itself. The script is executed in this folder as its working directory once it is all copied over to the machine.
VMM Cloud	Choose a VMM cloud and click View Details to view the cloud details for VMs in the cloud, host groups, logical network, port classifications, storage classifications, library share, load balancers, capacity, capability profiles, and VIP template.
Topology	Choose a topology type and click View Connectivity to view topology in the hierarchical, concentric, circular, or force directed view mode and adjust factors such as item spacing, distance, radius, rigidity, and force distance.
Top 5 Reports	Displays reports on the top five VMs, hosts, and vDCs in several categories, including memory usage, CPU usage, and disk usage.
Map Reports	Displays reports as maps, including a CPU utilization map, VM density, inactive VMs, and storage usage.
More Reports	Provides tabular, trending, and instant reports on VMs, CPUs, events, snapshot file size, CPU usage, and disk.

Viewing the Storage Report

Step 1 Choose **Virtual > Storage**.

Step 2 Expand the Clouds and choose the SCVMM cloud.

You can view the storage details in the following tabs:

Tab	Description
Summary	<p>Displays the overview of datastore, local storage information, NTFS (SAN), and Server Message Block (SMB) in the tabular format. Displays the following graphs:</p> <ul style="list-style-type: none"> • Used storage per storage type • Total capacity per storage type • Trend: Storage capacity, used, and free (last week) • Trend: Storage free by storage type (last week) • Trend: Storage used by storage type (last week) • Total capacity used by storage type (last week) • Free storage per storage type
DataStore Capacity Report	<p>Displays the datastore capacity report. Choose a report and click View Details to view more details about the report. The report includes summary, VM Disks, hosts, top five reports, service request details, and more.</p>
File Server Report	<p>Displays the file server report. Choose a report and click View Details to view the file shares report and service request details.</p>
Storage Array Report	<p>Displays the storage array report. Choose a report and click View Details to view the storage pools report and service request details.</p>
Storage Provider Report	<p>Displays the storage provider report with the status. Choose a report and click View Details to view the service request details.</p>
Storage Classifications Report	<p>Displays the storage classification name, account name, description, accessibility, if enabled, and the SCVMM cloud to which it is assigned. Choose a report and click View Details to view the storage pools report and service request details.</p>
Map Reports	<p>Displays storage usage reports as maps. Click the Show Labels check box to view the report label.</p>
More Reports	<p>Provides tabular, trending, and instant reports on storage provider, storage capacity, and storage usage reports.</p>

Viewing Network Reports

Step 1 Choose **Virtual > Network**.

Step 2 Expand the Clouds and choose the SCVMM cloud.
You can view the network details in the following tabs:

Tab	Description
Summary	Displays an overview of virtual networks information.
Network Inventory Report	Displays the host node, VLAN supported, virtual networks, physical network adapters, and host power state information.
Host Network Adapters Report	Displays the host node, name, connection name, network location, logical networks, physical address, IP address, status, VLAN mode, VLAN IDs, virtual network, and description information.
VM Network Adapters Report	Displays the ID, VM name, host name, name, adapter type, access, physical address, enable state, VLAN ID, MAC address, logical network, VM network, VM subnet, and virtual network information.
Logical Networks Report	Displays the name, description, network virtualization enabled, private LAN enabled, use GRE, isolated sites, network entity access, virtual switch extension manager, and the SCVMM cloud to which it is assigned.
Logical Switches Report	Displays the account name, name, description, uplink mode, minimum bandwidth mode, SRIOV enabled, and virtual switch extensions information.
MAC Address Pools Report	Displays the name, description, starting MAC address, ending MAC address, available addresses, unassigned addresses, total addresses, host groups, and supported virtualization platforms information.
Static IP Address Pools Report	Displays the account name, name, description, subnet, VLAN ID, starting IP address, ending IP address, if it is a multicast pool, DNS servers, default gateway, WINS servers, logical network definition, and VM subnet information
Port Classifications Report	Displays the name, description, logical switch, SCVMM cloud, and tag information.

Tab	Description
Virtual Network Adapter Port Profiles Report	Displays the name, description, minimum bandwidth weight, absolute minimum bandwidth (Mbps), absolute maximum bandwidth, allow teaming, allow MAC address spoofing, allow IEEE priority tagging, enable DHCP guard, enable VMQ, enable IPsec offload, enable SR-IOV, network entity access type, and virtual switch extensions information.
Uplink Port Profiles Report	Displays the name, description, load balancing algorithm, teaming mode, network virtualization enabled, logical network definitions, network entity access type, and virtual switch extensions information.
Network Services Report	Displays the account, name, connection string, manufacturer, model, run as account, and provider information.
Virtual Switches Report	Displays the host node, name, network type, highly available, network optimization available, virtual DHCP enabled, description, and tag information.
VM Networks Report	Displays the name, description, logical network, isolation type, GRE enabled, P VLAN enabled, network entity access type, and tag information.

Cloudsense Reports

CloudSense Analytics in Cisco UCS Director provide visibility into the infrastructure resources utilization, critical performance metrics across the IT infrastructure stack, and capacity in real time. CloudSense significantly improves capacity trending, forecasting, reporting, and planning of virtual and cloud infrastructures.

You can generate the following reports for Hyper-V accounts with CloudSense:

- Hyper-V cloud utilization summary report
- VM activity report by group
- VM performance summary
- Virtual infrastructure and assets report

Generating a Report

Before You Begin

You must be signed into the appliance before completing this task.

Step 1 Choose **CloudSense > Reports**.

Step 2 Click a tab based on the type of report you want to generate. It can be one of the following:

- Application Container Report
- Billing Report for a Customer
- Cisco C880M4 Inventory Report
- EMC Storage Inventory Report
- Group Infrastructure Inventory Report
- Hyper V Cloud Utilization Summary Report
- IBM Storwize Inventory Report
- NetApp Storage Inventory Report
- NetApp Storage Savings Per Group Report
- NetApp Storage Savings Report
- Network Impact Assessment Report
- Organizational Usage of Virtual Computing Infrastructure Report
- PNSC Account Summary Report
- Physical Infrastructure Inventory Report for a Group
- Service Request Statistics
- Service Request Statistics Per Group
- Storage Dedupe Status Report
- Storage Inventory Report for a Group
- Thin Provisioned Space Report
- UCS Data Center Inventory Report
- VM Activity Report By Group
- VM Performance Summary Report
- VMware Cloud Utilization Summary Report
- VMware Host Performance Summary Report
- Virtual Infrastructure and Assets Report

Step 3 Click **Generate Report**.

Step 4 In the **Generate Report** screen, complete the required fields, including the following:

Name	Description
Context drop-down list	Select the group that you want to generate the report for. Note If you are an administrator, then this drop-down list displays all the groups for which you have administrative privileges. For example, if you are an MSP administrator, then this drop-down list displays all the customer groups that you manage. This list does not display any other groups.
Report Label field	You can provide a label for the report to distinguish it from the other reports that you generate.

Step 5 Click **Submit**.

The report is generated in the system. This generated report is accessible only to you and to users in the groups that you manage. For example, if you are an MSP administrator, then this generated report is not visible to other MSP administrators or groups.

Generating an Assessment

Step 1 Choose **CloudSense > Assessments**.

Step 2 Click **Generate Report**.

Step 3 In the **Generate Report** screen, complete the required fields, including the following:

Name	Description
Context drop-down list	Select the group that you want to generate the report for. Note If you are an administrator, then this drop-down list displays all the groups for which you have administrative privileges. For example, if you are an MSP administrator, then this drop-down list displays all the customer groups that you manage. This list does not display any other groups.
Report Label field	You can provide a label for the report to distinguish it from the other reports that you generate.

Step 4 Click **Submit**.
