Multiple Disk VM Provisioning

This chapter contains the following sections:

About Multiple Disk VM Provisioning

Cisco UCS Director supports virtual machine (VM) provisioning of multiple disks from a template. You can configure VM disk provisioning on a preferred single datastore or on multiple datastores. You can also configure individual disk policies for each additional disk in a template.

Cisco UCS Director classifies the disks into the following categories:

- System
- Data
- Database
- Swap
- Log

Note The disk categories that are defined by Cisco UCS Director are for disk labeling only.

Overview of the Procedure for Multiple Disk VM Provisioning

Step 1 Check for the availability of a template with multiple disks.

Step 2	Assign disk categories.
Step 3	Define the storage policy.
Step 4	Create the template catalog.

About Templates with Multiple Disks

To provision a multiple disk virtual machine (VM), a template (image) with multiple disks, must be available. Before using a template with multiple disks for VM provisioning, you must assign the disk categories for individual disks.

Assigning Disk Categories

Step 1	Choose **Virtual** > **Compute**.
Step 2	On the **Compute** page, choose the cloud.
Step 3	On the **Compute** page, click **Images**.
Step 4	Click the row with a template with multiple disks and click **View Details**.
Step 5	Click **Disks**.
Step 6	Choose a disk.
Step 7	Click the row with the disk for which you want to assign a disk type and click **Assign Disk Type**.
Step 8	On the **Assign Disk Type** screen, choose the disk type from the drop-down list.

It can be one of the following:

- **System**

- **Data**

- **Database**

- **Swap**

- **Log**

| Step 9 | Click **Submit**. |

Defining Storage Policies

A storage policy defines resources such as datastore scope, type of storage to use, minimum conditions for capacity, and latency. This policy also provides an option to configure additional disk policies for multiple disks, and an option to provide datastore choices for end users during a service request creation.

Cisco UCS Director supports VM provisioning with multiple disks on multiple datastores. There are five types of disks: System, Data, Database, Swap, and Log. The System disk policy is configured first, and the

other disks are configured later depending on the requirements. You can configure the disk policy individually for each disk type, or choose the default system disk policy.

When using additional disk policies, be sure to uncheck the **Provision all disks in a single datastore** option during catalog creation for the multiple disk template. For more information about catalog creation, see Adding a Catalog, on page 8.

In addition, Cisco UCS Director supports datastore selection during the creation of a service request for VM provisioning. It gives you an option to enable or disable datastore selection for the end user. When a VDC is specified at creation of a service request, the scope conditions defined in its storage policy determine which datastores appear for selection here.

Note   VMware VM provisioning fails when the datastore capacity specified in a storage policy uses the **equals** condition for decimal values with two values after the decimal (hundreths place). If specifying a capacity that includes decimal values, round the value up to one value after the decimal (tenths place).

See the Cisco UCS Director Troubleshooting Guide.

Creating a Storage Policy

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

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

Step 3   Click **Add**.

Step 4   On the **Add Storage Resource Allocation Policy- System Disk Policy** screen, complete the following fields

Name	Description
Policy Name field	Choose the cloud in which resource allocation occurs.
Policy Description field	The description of the policy.
	If you want to narrow the scope of deployment, choose whether to use all, include selected data stores, or exclude selected data stores.
Cloud Name drop-down list	Choose the cloud account for this resource allocation.
	If you choose an SRM account, the **Enable Protection** check box is displayed. For more information about how to enable protection groups for Site Recovery Manager, see the Cisco UCS Director VMware Management Guide.
System Disk Scope	
Use Linked Clone check box	If you want to use a linked clone, click the check box.
	If you do not click this check box, the configuration uses a full clone.
Storage Profile drop-down list	Choose a storage profile if you want to provision one or more VMs with the associated storage profile.

Name	Description
Data Stores/Data Store Clusters Scope drop-down list	To define the scope of deployment, choose one of the following options: • **All** • **Include Selected Datastores** • **Exclude Selected Datastores** • **Include Selected Datastore Clusters** • **Exclude Selected Datastore Clusters** Depending upon which option you choose, additional fields may display. **Note** The option that you choose determines which datastores or datastore clusters are available when you create a VM disk.
Selected Data Stores field	If you chose **Include Selected Datastores** or **Exclude Selected Datastores**, click **Select** to choose the appropriate datastores.
Use Shared Data Store Only check box	Click the check box to use shared datastores only. This option is only available if you chose to include or exclude selected datastores.
Selected Datastore Clusters field	If you chose **Include Selected Datastore Clusters** or **Exclude Selected Datastore Clusters**, click **Select** to choose the appropriate datastore clusters.
Select SDRS Rule Type drop-down list	If you chose to include or exclude selected datastore clusters, choose one of the following SDRS rule types: • **Keep VMDKs Together**—You need to select an existing rule on the filtered clusters. The newly provisioned VM is added to the VM anti-affinity rule. • **Separate VMDKs**—If the newly provisioned VM contains more than one disk, a new VM affinity rule is created on the datastore cluster.
Select SDRS Rule field	If you chose **Keep VMDKs Together**, you must choose the VMs that you want to apply the rule to.
Storage Options	
Use Local Storage check box	By default, the field is checked. Uncheck the check box if you do not want to use local storage.
Use NFS check box	By default, the field is checked. Uncheck the check box if you do not want to use NFS storage.

Name	Description
Use VMFS check box	By default, the field is checked. Uncheck the check box if you do not want to use VMFS storage.
Use SAN check box	By default, the field is checked. Uncheck the check box if you do not want to use SAN storage.
Filter Conditions check boxes	To add one more conditions to filter the datastores, do the following for each desired condition: • Click the appropriate check box. • Choose the desired option from the drop-down list. • Enter the criteria by which you want to filter the datastores. Any datastores that do not meet these criteria are excluded from consideration. If more than one condition is chosen, all conditions must match. **Note** VMware VM provisioning fails when the datastore capacity specified in a storage policy uses the **equals** condition for decimal values with two values after the decimal (hundreths place). If specifying a capacity that includes decimal values, round the value up to one value after the decimal (tenths place). For example if the value is 10.25 GB, it displays as 10.3 GB in the datastore report. For all options, you must specify any value less than 10.3 but rounded to one value after the decimal, such as 10.2 GB, 10.1 GB, or 10 GB.
Override Template check box	Check the check box to override the template properties. You are provided with options to enter custom settings, such as using thin provisioning or setting a custom disk size.
Use Thin Provisioning check box	Check the check box to use thin provisioning during VM storage provisioning. Thin provisioning enables dynamic allocation of physical storage capacity to increase VM storage utilization. This option is only available if you choose **Override Template**.
Manual Disk Size	A custom disk size that overrides the disk size of the template used for VM provisioning. This option is only available if you choose **Override Template**.

Name	Description
Resizing Options for VM Lifecycle	
Allow Resizing of Disk check box	Check the check box to provide the end user with an option to choose the VM disk size before provisioning.
Permitted Values for Disk in GB field	Specify the disk size values that can be chosen while provisioning a VM. You can specify these values in one of the following formats: • Range such as 10-1000 • Comma separated values such as 1, 5, 10, 50, 100, 500, 1024, 5120, 10240. • Combination of range and comma separated values such as 1,5,10, 10-1000. This option is only available if you choose **Allow Resizing of Disk**.
Allow user to select datastores from scope check box	Check the check box to provide the end user with an option to choose the datastore during the service request creation.

Step 5   Click **Next**.

Step 6   On the **Additional Disk Policies** screen, do one of the following:

- Choose a disk type to configure if you do not want to use the same disk policy for that disk type as you configured in the System Disk Policy.
- Click **Next** if you want to use the System Disk Policy options for all disk types.

Note   By default, the disk policy for the disk is the same as in the System Disk Policy that you configured on the **Add Storage Resource Allocation Policy** screen.

Step 7   If you chose to configure a custom system disk policy for a specific disk type, do the following:

a) Click the row with the policy you want to edit, and click **Edit** to edit the disk type.

b) On the **Edit Policies Entry** screen, uncheck **Same as System Disk Policy**.

c) On the **Edit Entry** screen, complete the fields.

All the fields displayed here are the same as the fields displayed in the **Add Storage Resource Allocation Policy** screen.

Note   This configuration determines which datastores are available for the disk type when you create a VM disk.

d) Click **Submit**.

e) Repeat these steps to configure the other disk types, if desired.

Note   To use the storage policy created with additional disk policies, you must associate the policy with the VDC that is used for the VM provisioning

Step 8   Click **Next**.

Step 9 On the **Hard Disk Policy** screen, you can specify the number of physical disks that you want to create during VM provisioning.

a) Click **Add** to add a disk and complete the following fields:

Field	Description
Disk Label field	A descriptive label for the disk you are adding.
Disk Size (GB) field	The size of the disk.
Disk Type drop-down list	Choose the disk type. The options that you see in this drop-down list depends on whether you selected the **Same as System Policy** check box earlier in this procedure.
Controller Options	
Controller Type drop-down list	Choose a controller type from the drop-down list. Based on the availability of ports, a controller is mapped to the VM disks.
Create Disk on new Controller check box	Check this check box to create a new controller. The type of controller that is created is based on the selection you made in the **Controller Type** drop-down list.
Disk Provisioning Options	
Disk Provisioning Options radio buttons	Check the radio button of the type of provisioning you want to specify. You can specify one of the following: • **Thin Provision** • **Thick Provision lazy zeroed** • **Thick Provision eager zeroed**
Resizing Options for VM Life cycle	
Allow Resizing of Disk check box	Check the check box to enable editing of the VM disk size before provisioning.

Field	Description
Permitted Values for Disk in GB field	This option appears if **Allow Resizing of Disk** is checked. Specify the custom range of disk size values that are chosen while provisioning a VM. You can specify these values in one of the following formats: • Range such as 10-1000 • Comma separated values such as 1, 5, 10, 50, 100, 500, 1024, 5120, 10240. • Combination of range and comma separated values such as 1,5,10, 10-1000.
Allow user to select datastore from scope check box	Check the check box to provide the user with an option to choose the datastore during the service request creation.

Step 10   Click **Submit**.

Note   To use the storage policy created with additional disk policies, you need to associate the policy with the VDC that is used for the VM provisioning.

When using the Additional disks policies configured in a policy, make sure to uncheck **Provision all disks in a single database** during catalog creation for the multiple disk template. For more information about catalog creation, see Managing Catalogs.

Creating a Catalog

Adding a Catalog

Step 1   Choose **Policies** > **Catalogs**.

Step 2   On the **Catalogs** page, click **Add**.

Step 3   On the **Add Catalog** screen, choose the **Catalog Type** that you want to add.

It can be one of the following:

• **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.

For information on how to create a bare metal catalog, see Creating a Bare Metal Server Catalog.

Step 4   Click **Submit**.

Step 5   On the **Add Catalog: 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	Click **Select** to the check the checkboxes of specific user groups. The checked groups use this catalog to provision new VMs. After checking the checkboxes of user groups, click **Select** to return to the **Add Catalog** screen.
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.
Cloud Name drop-down list	Choose the cloud with the image for VM provisioning.
Provision new VM for ISO mounting check box	Check this box to clone a new VM from a selected image. If you do not check this check box, a blank VM is created.

Name	Description
Image list	Click **Select** to the check the checkboxes of the type of image (any existing templates such as Windows, Linux, and other files that make up the image) to use when VMs are provisioned using this catalog. After checking the checkboxes of the required images, click **Select** to return to the **Add Catalog** screen. If you are a group administrator, or a user in a group with permissions to create catalogs, this field displays images that are assigned to the group to which you belong. If you are an MSP administrator, then this field displays images that are assigned to your MSP organization, and to the groups within the MSP organization.
Provision new VM using Content Library VM Template check box	Check this box to ensure that the new VM is provisioned using the Content Library VM Template. If you choose this option, the **Image** list is hidden.
Content Library VM Template list	Choose the content library VM template.
Windows License Pool field	Enter the Windows License. **Note** This field appears only when a Windows image is chosen. This option is not supported in the RHEV KVM Connector.
Use ReadyClone check box	Check the box to ensure that VMs are deployed using ReadyClones. When this box is checked, the **Use Linked Clone** and **Provision all disks in single datastore** check boxes are not available for editing. **Note** This checkbox is not visible if: 1. The selected image is not on the HX datastore. 2. The VM has multiple disks.
Use Linked Clone check box	Check the box if you want to use a linked clone. Linked Clone or Full Clone depends on the Linked Clone selection in the Storage Policy. **Note** This field appears only when a Snapshot image is chosen.

Name	Description
Provision all disks in single datastore check box	Check the box to provision all disks in a single datastore. You can also choose to use the datastores configured for each disk in the storage policy. **Note** This field appears only if the chosen template has multiple disks. This option is not supported in the RHEV KVM Connector.
Service Container Template Name drop-down list	Choose the template from the list. **Note** This field appears only when the chosen Catalog Type is **Service Container**.
Select Folder drop-down list	Choose the folder within which this catalog must be created. **Note** The drop-down list includes names of folders that are available by default. You can either choose a folder that is available, or click **Create New Folder**. On the **Add New Folder** screen, enter a **Folder Name**, choose a **Folder Icon**, and click **Add**.
Bare Metal Server Provisioning Policy drop-down list	**Note** This field appears only when the chosen Catalog Type is **Bare Metal**.
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 **Add Catalog: Application Details** screen, complete the required fields, including the following:

Name	Description
Category list	Expand the list to choose a VDC category and click **Select**.
Override check box	Check the box to enable the user to override the selected category while provisioning a VM using a service request.
Support Contact Email Address field	Enter the email address of the contact who is notified when a service request is created using this catalog item.
Specify OS drop-down list	Choose the type of OS installed on the VM when it is provisioned. **Note** This option is not supported in the RHEV KVM Connector.

Name	Description
Specify Other OS field	Enter an OS that is not available in the **Specify OS** drop-down list.
	Note This option is not supported in the RHEV KVM Connector.
Specify Applications check boxes	Check the appropriate boxes to specify applications that are installed on the VM during provisioning.
	Note This option is not supported in the RHEV KVM Connector.
Specify Other Applications field	Enter other applications that are not available from the **Specify Applications** check boxes.
	Note This option is not supported in the RHEV KVM Connector.
Application Code field	Enter an application code that is used in the VM name.
	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 ${APPCODE}.
	For example, if the VM Name Template is vm-${GROUP_NAME}-${APPCODE}, the VM provisioned with the system policy has the name vm-groupname-W2K3.
	Note This option is not supported in the RHEV KVM Connector.

Step 8   Click **Next**.

Step 9   On the **Add Catalog: User credentials** screen, complete the required fields, including the following:

     Note   These options are not supported in the RHEV KVM Connector.

Name	Description
Credential Options drop-down list	Choose to allow or disallow users to retrieve VM access credentials (shared). The following options are available: • **Do not share** • **Share after password reset** • **Share template credentials** The **Do not share** option is chosen if the administrator wants to send the credentials privately to another user outside Cisco UCS Director.

Name	Description
User ID field	Enter the user ID. **Note** This field is available only if a choice is made to share under **Credential Options**.
Password field	Enter the password. **Note** This field is available only if a choice is made to share under **Credential Options**.

Step 10   Click **Next**.

Step 11   On the **Add Catalog: Customization** screen, complete the required fields, including the following:

Name	Description
Automatic Guest Customization Enable check box	Check the box to enable automatic guest customization. If you do not check this check box, then Cisco UCS Director does not configure the DNS, Network, and Guest OS properties.
Pre Provisioning Custom Actions Enable	Check the **Enable** check box to enable execution of an orchestration workflow before VM provisioning.
Workflow field	Click **Select** to check the compound workflow that should be used in the orchestration workflow before VM provisioning. Check the check boxes of the required workflows, and click **Select** to return to the **Add Catalog** screen. **Note** This field appears when **Pre Provisioning Custom Actions Enable** is checked.
Post Provisioning Custom Actions Enable check box	Check the box to enable execution of an orchestration workflow after VM provisioning.
Workflow drop-down list	Click **Select** to check the check boxes of the workflows that need to be used in the orchestration workflow after VM provisioning. Check the check boxes of the required workflows, and click **Select** to return to the **Add Catalog** screen. **Note** This field appears when **Post Provisioning Custom Actions Enable** is checked.
Virtual Storage Catalog Enable check box	Check the box to choose storage entries from the Virtual Storage catalog.

Name	Description
Virtual Storage Catalog drop-down list	Chose a storage entry from the catalog.
	Note This field appears when **Virtual Storage Catalog Enable** is checked.
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.
	Note This option is not supported in the RHEV KVM Connector.
Inactive VM Application Cost USD field	Enter the cost to this catalog of a VM in inactive state, per hour or month.
	Note This option is not supported in the RHEV KVM Connector.
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 **Add Catalog: VM Access** screen, complete the required fields, including the following:

Name	Description
Web Access Configuration Enable check box	Check the box to enable web access to the VM. By default, this check box is unchecked which means that web access to the VM is disabled.
URL field	Enter the URL of the VM.
	Note This field appears when **Web Access Configuration Enable** is checked.

Name	Description
Label field	Enter the label that is defined for this URL. **Note** This field appears when **Web Access Configuration Enable** is checked.
Remote Desktop Access Configuration Enable check box	Check the box to enable remote desktop access to the VM. By default, this check box is unchecked, which means that remote desktop access to the VM is disabled.
Server field	Enter the IP address of the server for remote access. **Note** This field appears when **Remote Desktop Access Configuration Enable** is checked.
Port field	Enter the port number on the server for remote access. **Note** This field appears when **Remote Desktop Access Configuration Enable** is checked.
Label field	Enter the label that is defined for this remote access. **Note** This field appears when **Remote Desktop Access Configuration Enable** is checked.
VMRC Console Configuration Enable check box	Check the box to enable VMRC console access to the VM. By default, this check box is unchecked, which means that the VMRC console access to the VM is disabled.

Step 14   Click **Next**.

Step 15   Review the catalog information on the **Add Catalog: Summary** screen.

Step 16   Click **Submit**.

Creating a VM Disk

You can add an additional disk with a custom size to provisioned or discovered VMs using the **Create VM disk** option.

Step 1   Choose **Virtual** > **Compute**.

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

Step 3   On the **Compute** page, click **VMs**.

Step 4   Click the row with the VM for which you want to create a VM 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. Once entered, the VM name cannot be edited.
New Disk Size (GB) field	The disk size for the VM, in GB. Enter an integer in this field. This integer should be within the range or among the comma separated values specified in the storage policy associated with this VM.
Select Disk Type drop-down list	Choose the disk type. It can be one of the following: • **System** • **Swap** • **Data** • **Database** • **Log**
Select Datastore/Datastore Cluster drop-down list	Specify if the VM disk should be created from a datastore or a datastore cluster.
Select Datastore field	Click **Select** and choose which datastore you want to use to create the VM disk. **Note** The available datastores depend upon the storage policy associated with the VDC. Only datastores that meet the criteria specified in the storage policy are available for the VM disk. This field is only available if you specify that the VM disk should be created from a datastore.
Select Datastore Cluster field	Click **Select** and choose which datastore cluster you want to use to create the VM disk. **Note** The available datastore clusters depend upon the storage policy associated with the VDC. Only datastore clusters that meet the criteria specified in the storage policy are available for the VM disk. This field is only available if you specify that the VM disk should be created from a datastore cluster.
Thin Provision check box	Check the check box to add a thin provisioned disk to the VM. **Note** Thin provisioning enables dynamic allocation of physical storage capacity to increase VM storage utilization.

Name	Description
Compute New Disk Cost option	This option calculates the cost of the new disk based on the input you specified, and displays it in the dialog box.

Step 7   Click **Create**.