



Cisco UCS Director HyperFlex Systems Management Guide, Release 6.7

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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> .
System output	Terminal sessions and information that the system displays appear in <i>this font</i> .

Text Type	Indication
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.

Communications, Services, and Additional Information

- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
- To get the business impact you're looking for with the technologies that matter, visit [Cisco Services](#).
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- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).

Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 1

New and Changed Information for this Release

- [New and Changed Information for this Release, on 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.

Feature	Description	Where Documented
Support for Connection Timeout (Seconds) and Socket Read Timeout (Seconds)	Support for providing Connection timeout and socket read timeout values while adding Hyperflex account through Wizards, Credential policy, and in Physical accounts page.	Adding a Cisco UCS Manager Account Creating a HyperFlex Pod in Cisco UCS Director Adding a HyperFlex Account



CHAPTER 2

Overview

- [Integration between Cisco UCS Director and Cisco HyperFlex System, on page 3](#)
- [Cisco UCS Director, on page 3](#)
- [Cisco HyperFlex HX-Series Systems, on page 5](#)

Integration between Cisco UCS Director and Cisco HyperFlex System

The integration between Cisco UCS Director and Cisco HyperFlex System begins after you create the Cisco HX Data Platform clusters. After you configure the integration, Cisco UCS Director can communicate with the components of a supported Cisco HyperFlex System, including the following:

- VMware vCenter
- Supported Cisco UCS servers that are managed by Cisco UCS Manager
- Cisco HX Data Platform

You can use Cisco UCS Director to manage the following for a supported and integrated Cisco HyperFlex System:

- Inventory collection
- Discovery of clusters, disks, datastores, and controller VMs
- Datastore provisioning and management
- Automation and orchestration of VM provisioning
- Status reporting
- Replication of VMs between clusters for disaster recovery

Cisco UCS Director

Cisco UCS Director is a complete, highly secure, end-to-end management, orchestration, and automation solution for a wide array of Cisco and non-Cisco data infrastructure components, and for the industry's leading

converged infrastructure solutions based on the Cisco UCS and Cisco Nexus platforms. For a complete list of supported infrastructure components and solutions, see the [Cisco UCS Director Compatibility Matrix](#).

Cisco UCS Director is a 64-bit appliance that uses the following standard templates:

- Open Virtualization Format (OVF) for VMware vSphere
- Virtual Hard Disk (VHD) for Microsoft Hyper-V

Management through Cisco UCS Director

Cisco UCS Director extends the unification of computing and networking layers through Cisco UCS to provide you with comprehensive visibility and management of your data center infrastructure components. You can use Cisco UCS Director to configure, administer, and monitor supported Cisco and non-Cisco components. The tasks you can perform include the following:

- Create, clone, and deploy service profiles and templates for all Cisco UCS servers and compute applications.
- Monitor organizational usage, trends, and capacity across a converged infrastructure on a continuous basis. For example, you can view heat maps that show virtual machine (VM) utilization across all your data centers.
- Deploy and add capacity to converged infrastructures in a consistent, repeatable manner.
- Manage, monitor, and report on data center components, such as Cisco UCS domains or Cisco Nexus network devices.
- Extend virtual service catalogs to include services for your physical infrastructure.
- Manage secure multi-tenant environments to accommodate virtualized workloads that run with non-virtualized workloads.

Automation and Orchestration with Cisco UCS Director

Cisco UCS Director enables you to build workflows that provide automation services, and to publish the workflows and extend their services to your users on demand. You can collaborate with other experts in your company to quickly and easily create policies. You can build Cisco UCS Director workflows to automate simple or complex provisioning and configuration processes.

Once built and validated, these workflows perform the same way every time, no matter who runs the workflows. An experienced data center administrator can run them, or you can implement role-based access control to enable your users and customers to run the workflows on a self-service basis, as needed.

With Cisco UCS Director, you can automate a wide array of tasks and use cases across a wide variety of supported Cisco and non-Cisco hardware and software data center components. A few examples of the use cases that you can automate include, but are not limited to:

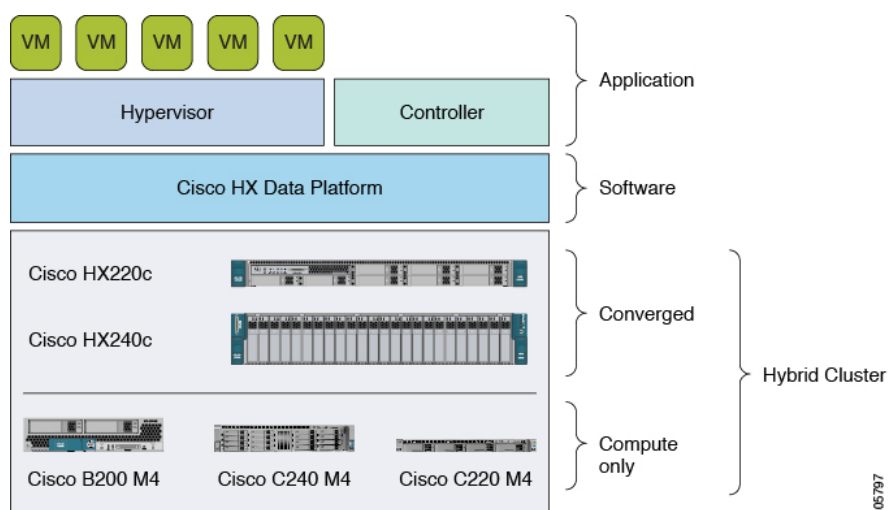
- VM provisioning and lifecycle management
- Network resource configuration and lifecycle management
- Storage resource configuration and lifecycle management
- Tenant onboarding and infrastructure configuration
- Application infrastructure provisioning

- Self-service catalogs and VM provisioning
- Bare metal server provisioning, including installation of an operating system

Cisco HyperFlex HX-Series Systems

Cisco HyperFlex HX-Series System provides a fully contained virtual server platform, that combines all three layers of compute, storage, and network with the powerful Cisco HX Data Platform software tool resulting in a single point of connectivity for simplified management. The Cisco HyperFlex HX-Series Systems are modular systems designed to scale out by adding HX nodes under a single UCS management domain. The hyperconverged system provides a unified pool of resources based on your workload needs.

Figure 1: Overview of the Cisco HyperFlex System



Cisco HyperFlex HX-Series System Documentation

See the listed Cisco HyperFlex HX-Series System document for the associated tasks.

You can access links to all Cisco HyperFlex HX-Series System documentation on the [Cisco HyperFlex Systems Documentation Roadmap](#).

To perform the following	See the document
Review a list of new features, known issues, and workarounds.	Release Notes for Cisco HX Data Platform
Install and complete initial setup of your HX Data Platform.	HyperFlex Node Hardware Installation Guides Cisco HyperFlex Systems Getting Started Guide
Administer, manage, and monitor your HX Storage Cluster using the HX Data Platform plug-in on your VMware vSphere Web Client.	Cisco HyperFlex Systems Administration Guide

To perform the following	See the document
Administer, manage, and monitor your HX Storage Cluster using the HX Data Platform command line interface on an HX controller VM.	Cisco HX Data Platform Command Line Interface Reference Guide



CHAPTER 3

Setting Up a HyperFlex Pod

- [Prerequisites, on page 7](#)
- [HyperFlex Pod Configuration, on page 8](#)
- [Creating a HyperFlex Pod in Cisco UCS Director, on page 8](#)
- [Manual Configuration of HyperFlex Pod in Cisco UCS Director, on page 10](#)

Prerequisites

Before you configure this integration, you must complete the prerequisites in Cisco HyperFlex System and Cisco UCS Director.

Cisco HyperFlex System Prerequisites

The following prerequisites must be completed in your Cisco HyperFlex System before you integrate it with Cisco UCS Director:

Prerequisite	Link to Documentation
Install the Cisco HyperFlex HX-Series node.	Cisco HyperFlex HX-Series Install and Upgrade Guides
Install and configure the Cisco HyperFlex System software.	Cisco HyperFlex Systems Getting Started Guide
Create the Cisco HX Data Platform clusters in VMware vCenter.	Cisco HyperFlex Systems Getting Started Guide

Cisco UCS Director Prerequisites

The following prerequisites must be completed in Cisco UCS Director before you integrate your Cisco HyperFlex System:

Prerequisite	Link to Documentation
Install Cisco UCS Director.	Cisco UCS Director Installation Guides

Prerequisite	Link to Documentation
(Optional) Install Cisco UCS Director Bare Metal Agent.	Cisco UCS Director Installation Guides
Install the Cisco UCS Director licenses.	Cisco UCS Director Installation Guides
Create the required groups and users.	Cisco UCS Director Administration Guide

HyperFlex Pod Configuration

When you log in to Cisco UCS Director, the Converged screen is displayed. This screen displays the currently configured pods in your environment. From this screen, you can add a new pod, or you can select a pre-existing pod and view the resource details within the pod.

You can create pods manually or by using a guided setup wizard.

Add All Servers with the HyperFlex Pod Configuration Wizard

The **HyperFlex Pod Configuration** wizard guides you through the creation of a pod in Cisco UCS Director for your Cisco HyperFlex System. It automatically adds all servers in a Cisco UCS Manager account. If you use this wizard, there is no option to add only certain servers to the pod. For configuring HyperFlex pod using guided setup wizard, see [Creating a HyperFlex Pod in Cisco UCS Director, on page 8](#)

Add Either Selected Servers or All Servers with a Manual Setup

A manual setup enables you to add either selected servers or all servers in a Cisco UCS Manager account based on the number of physical server licenses purchased. For manual configuration of HyperFlex pod, see [Manual Configuration of HyperFlex Pod in Cisco UCS Director, on page 10](#)

After you complete the pod configuration, your Cisco HyperFlex System is available for datastore management and for VM provisioning.

Creating a HyperFlex Pod in Cisco UCS Director

Before you begin

You must complete all prerequisites in [Prerequisites, on page 7](#).

Step 1 Choose **Administration > Guided Setup**.

Step 2 Double-click **HyperFlex Pod Setup** to launch the wizard.

If the **Guided Setup** screen launches when you open Cisco UCS Director, check the box for the **HyperFlex Pod Configuration** wizard and click **Submit** twice. You can then move to Step 4.

Step 3 On the **Overview** screen, review the content and click **Next**.

Step 4 On the **Pod** screen, do one of the following and then click **Next**.

- From the **Pod** drop-down list, choose an existing HyperFlex pod.

- Click **Add POD Form** to complete the fields to create a new HyperFlex pod and then click **Add**.

Step 5 On the **VMware** screen, do the following:

a) From the **Accounts** drop-down list, choose one of the following:

- An existing VMware cloud account
- **Select** to create a new VMware cloud account

b) If you chose **Select**, complete the fields in the **Create New Account** area.

To create a new account, you need the following:

- Cloud name
- vCenter or host address
- Credential policy or the user ID and password for a valid vCenter account with administrative or root privileges
- Port used to access the vCenter address
- Access URL

The remaining fields on the screen are optional.

c) Click **Next**.

Step 6 On the **Cisco UCS Manager** screen, do the following:

a) From the **Accounts** drop-down list, choose one of the following:

- An existing Cisco UCS Manager account
- **Select** to create a new Cisco UCS Manager account

b) If you chose **Select**, complete the fields in the **Create New Account** area.

To create a new account, you need the following:

- Account name
- Server address
- Credential policy or the user ID and password for a valid Cisco UCS Manager account with administrative privileges
- Transport type
- Port used to access that address

Note This process automatically adds all the servers to the pod. If the number of licenses are less than the number of servers, you receive an error message. To resolve this issue, cancel the guided setup wizard, and instead configure the HyperFlex Pod manually. See [Manual Configuration of HyperFlex Pod in Cisco UCS Director, on page 10](#).

c) Click **Next**.

Step 7 On the **Cisco HyperFlex** screen, do the following:

a) From the **Accounts** drop-down list, choose one of the following:

- An existing Cisco HyperFlex account
- **Select** to create a new Cisco HyperFlex account

b) If you chose **Select**, complete the fields in the **Create New Account** area.

To create a new account, you enter the following:

- Account name
- Cluster management IP address
- Check **Use Credential Policy** check box if you want to use an existing credential policy and select a Credential policy from the drop-down list
- User ID and password for a valid Cisco HX Data Platform account with administrative privileges if you do not use a credential policy
- HTTPS port and SSH port that use the same HyperFlex credentials
- Connection Timeout (in Seconds) and Socket Read Timeout (in Seconds) required for the Cisco UCS Director to establish a connection with the Hyperflex device and retrieve information from the Hyperflex device respectively.

c) Click **Next**.

Step 8 On the **Summary** screen, review the status of each item that you configured in the wizard.

Step 9 Click **Close** if all items on the **Summary** screen are acceptable. To update your configuration, click **Back**.

Manual Configuration of HyperFlex Pod in Cisco UCS Director

Before you begin

Complete all prerequisites in [Prerequisites, on page 7](#).

Verify that base licenses and server licenses to add Cisco UCS Manager and VMware accounts are available.

Step 1 Create (or select a pre-existing) a HyperFlex pod. See [Adding a Pod, on page 11](#).

When selecting pod **Type**, choose **HyperFlex** pod from the drop-down list.

Step 2 Add (or select a pre-existing) a VMware account. See [Creating a VMware Cloud, on page 12](#).

Step 3 Add (or select a pre-existing) a Cisco UCS Manager account. See [Adding a Cisco UCS Manager Account, on page 15](#).

When selecting **Server Management**, choose **Selected Servers** from the drop-down list to add specific servers to the HyperFlex pod.

Step 4 Add (or select a pre-existing) a HyperFlex account. See [Adding a HyperFlex Account, on page 17](#)

Adding a Pod

- Step 1** Choose **Administration > Physical Accounts**.
- Step 2** On the **Physical Accounts** page, click **Pods**.
- Step 3** Click **Add**.
- Step 4** On the **Add Pod** screen, complete the following fields:

Name	Description
Name field	A descriptive name for the pod.
Type drop-down list	<p>Choose the type of pod that you want to add. This can be one of the following:</p> <ul style="list-style-type: none"> • Flexpod • VersaStack • Generic • ExpressPod Medium • VSPEX • ExpressPod Small • Vblock • HyperFlex • Virtual SAN Pod <p>The nongeneric pod types accommodate only specific physical and virtual components. A generic pod does not require a specific pod license. You can add any type of physical or virtual component to a generic pod. For more information about bundled pod licenses (FlexPod, Vblock, and VSPEX), which include the necessary individual device licenses to run a pod, see the Cisco UCS Director Installation and Upgrade Guides.</p> <p>Note Only VersaStack and Generic pods are supported in the IBM accounts in Cisco UCS Director.</p>
Site drop-down list	Choose the site where you want to add the pod. If your environment does not include sites, you can omit this step.
Description field	(Optional) A description of the pod.
Address field	The physical location of the pod. For example, this field could include the city or other internal identification used for the pod.

Name	Description
Hide Pod check box	<p>Check to hide the pod if you do not want it to show in the Converged Check View. You can continue to add or delete accounts from the pod.</p> <p>For example, you can use this check box to ensure that a pod that does not have any physical or virtual elements is not displayed in the Converged View.</p>

Step 5 Click **Add**.

What to do next

Add one or more accounts to the pod.

Creating a VMware Cloud

When creating a VMware cloud, you can specify a datacenter and clusters in one of the following ways:

- Within the credential policy
- In the **VMware Datacenter** and **VMware Cluster** fields
- From the **Discover Datacenters / Clusters** check box



Note Either a datacenter within the credential policy or the VMware datacenter and VMware cluster can be selected. Specifying the datacenter in the **Add Cloud** screen and in the credential policy form results in an error.

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

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

Step 3 Click **Add**.

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

Name	Description
Cloud Type drop-down list	<p>Displays the available cloud types. Choose VMware.</p> <p>Note The following fields are displayed when VMware is chosen. Other cloud types display fields that are specific to that cloud type.</p>
Cloud Name field	<p>The cloud name. The name cannot include single quotes.</p> <p>Note Each cloud requires a unique name in Cisco UCS Director. Once a cloud has been added, all reports refer to the cloud using the Cloud Name.</p>

Name	Description
Server Address field	The vCenter server address
Use Credential Policy check box	Check this check box if you want to use a credential policy for this account rather than enter the information manually.
Use Credential Policy drop-down list	If you checked Use Credential Policy , choose the credential policy that you want to use from this drop-down list. This field is only displayed if you choose to use a credential policy.
Server User ID field	The vCenter server username.
Server Password field	The vCenter server password.
Server Access Port field	The server port number.
Server Access URL field	The server access URL.
VMware Datacenter field	The data center name on the vCenter account.
Discover Datacenters / Clusters check box	Check this check box to discover and use any VMware datacenters and associated VMware clusters.
VMware Cluster field	The name of the VMware cluster in the vCenter account. This name allows you to discover, monitor, and manage the specified pod's resources. Leave the field blank if the entire vCenter account is managed by Cisco UCS Director.
Select Datacenters / Clusters field	Check the associated datacenters and clusters you want to use. Note This field is visible only when you check the Discover Datacenters / Clusters check box.
Enable SRM check box	Check this check box to enable Site Recovery Manager (SRM) for the account.
Primary SRM Server Address field	The IP address of the primary SRM server. Note This field is visible only when you check the Enable SRM check box.
Primary SRM Server User ID field	The user ID for the primary SRM server. Note This field is visible only when you check the Enable SRM check box.
Primary SRM Server Password field	The password of the user for the primary SRM server. Note This field is visible only when you check the Enable SRM check box.

Name	Description
Primary SRM Server Access Port field	The port number for the primary SRM server. For SRM version 6.0, enter 9086 as the port number. Note This field is visible only when you check the Enable SRM check box.
Remote SRM Server User ID field	The user ID for the remote SRM server. Note This field is visible only when you check the Enable SRM check box.
Remote SRM Server Password field	The password of the user ID for the remote SRM server. Note This field is visible only when you check the Enable SRM check box.
Use SSO check box	Check this check box to use Single Sign-On (SSO) for authentication. The SSO option is only available for Virtual SAN (VSAN). SSO credentials are required for VM provisioning using storage profiles on the Virtual SAN cluster.
SSO Server Address field	The IP address of the Single-Sign On server. Note This field is visible only when you check the Use SSO check box.
SSO Server User ID field	The user ID for the SSO server. Note This field is visible only when you check the Use SSO check box.
SSO Server Password field	The password of the user ID for the SSO server. Note This field is visible only when you check the Use SSO check box.
SSO Server Access URL field	The URL for SSO server access. Note This field is visible only when you check the Use SSO check box.
SSO Server Access Port field	The port number. For vCenter version 5.x, enter 7444 as the port number. Note This field is visible only when you check the Use SSO check box.
Server Access URL field	The URL for server access.
Description field	The description of the cloud.

Name	Description
Contact Email field	The contact email address for the cloud.
Location field	The location.
Pod drop-down list	Choose the converged infrastructure pod. When you choose a pod name, the VMware cloud account is made available in the converged infrastructure stack. Note You cannot add more than one virtual account to a virtual SAN pod.
Service Provider field	The service provider's name.

Step 5 Click **Add**.

Adding a Cisco UCS Manager Account

Before you begin

Add the pod to which this Cisco UCS Manager account belongs.

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

Step 2 Click **Physical Accounts**.

Step 3 Click **Add**.

Step 4 On **Add Account** screen, do the following:

- a) From the **Pod** drop-down list, choose the pod to which this account belongs.
- b) From the **Category Type** drop-down list, choose **Computing**.
- c) From the **Account Type** drop-down list, choose **UCSM**.
- d) Click **Submit**.

Step 5 On the **Add Account** screen, complete the following fields:

Name	Description
Authentication Type drop-down list	Choose the type of authentication to be used for this account. This can be one of the following: <ul style="list-style-type: none"> • Locally Authenticated—A locally authenticated user account is authenticated directly through the fabric interconnect and can be enabled or disabled by anyone with admin or AAA privileges. • Remotely Authenticated—A remotely authenticated user account is any user account that is authenticated through LDAP, RADIUS, or TACACS+.

Name	Description
Server Management drop-down list	Choose how you want to have the servers in this account managed. This can be one of the following: <ul style="list-style-type: none"> • All Servers—All servers are managed. This option is the default. If you choose this option, all servers are added in the Managed state. • Selected Servers—Only selected servers are managed. You can add and remove servers from the managed server list as needed. If you choose this option, all servers are added in the Unmanaged state.
Account Name field	A unique name that you assign to this account.
Server Address field	The IP address of Cisco UCS Manager. For a cluster configuration, this is the virtual IP address.
Use Credential Policy check box	Check this check box if you want to use a credential policy for this account rather than enter the information manually.
Credential Policy drop-down list	If you checked the Use Credential Policy check box, choose the credential policy that you want to use from this drop-down list. This field is only displayed if you choose to use a credential policy.
User ID field	The username that this account will use to access Cisco UCS Manager. This username must be a valid account in Cisco UCS Manager. This field is not displayed if you choose to use a credential policy.
Password field	The password associated with the username. This field is not displayed if you choose to use a credential policy.
UCS Authentication Domain field	The authentication domain for the remotely authenticated account. This field is not displayed if you are using a locally authenticated account or if you choose to use a credential policy.
Transport Type drop-down list	Choose the transport type that you want to use for this account. This can be one of the following: <ul style="list-style-type: none"> • http • https This field is not displayed if you choose to use a credential policy.
Port field	The port used to access Cisco UCS Manager. This field is not displayed if you choose to use a credential policy.
Description field	(Optional) A description of this account.
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
Service Provider field	(Optional) The name of the service provider associated with this account, if any.

Step 6 Click **Add**.

Cisco UCS Director tests the connection to Cisco UCS Manager. If that test is successful, it adds the Cisco UCS Manager account and discovers all infrastructure elements in Cisco UCS Manager that are associated with that account, including chassis, servers, fabric interconnects, service profiles, and pools. This discovery process and inventory collection cycle takes approximately five minutes to complete.

The polling interval configured on the **Administration > System > System Tasks** tab specifies the frequency of inventory collection.

Adding a HyperFlex Account

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

Step 2 On the **Physical Accounts** page, click **Physical Accounts**.

Step 3 Click **Add**.

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

Name	Description
Pod drop-down list	Choose the HyperFlex pod to which this physical account belongs.
Category drop-down list	Choose Storage .
Account Type drop-down list	Choose HyperFlex .

Step 5 Click **Submit**.

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

Name	Description
Account Name field	A unique name for the physical account that you want to add.
Description field	A description of the account.
Cluster Management IP Address field	The HyperFlex cluster management IP address.
Use Credential Policy check box	Check this box if you want to use a credential policy for this account rather than enter the information manually.

Name	Description
Credential Policy drop-down list	If you checked Use Credential Policy , choose the credential policy that you want to use from this drop-down list. This field is only displayed if you choose to use a credential policy.
Username field	The username for accessing this account. This field is not displayed if you choose to use a credential policy.
Password field	The password associated with the username. This field is not displayed if you choose to use a credential policy.
HTTPs Port field	Enter server port number that you want to use for the account. This field is not displayed if you choose to use a credential policy.
Connection Timeout (Seconds) field	The time, in seconds, required for the Cisco UCS Director to establish a connection with the Hyperflex device. The value ranges from 0 to 1800 where 0 represents an infinite timeout.
Socket Read Timeout (Seconds) field	The time, in seconds, required for the Cisco UCS Director to retrieve information from the Hyperflex device. The value ranges from 0 to 1800 where 0 represents an infinite timeout.
Contact field	The contact email address for the account.
Location field	The location.

Step 7 Click **Submit**.

Cisco UCS Director tests the connection to Cisco HyperFlex. If that test is successful, it adds the account and discovers all infrastructure elements that are associated with that account. This discovery process and inventory collection cycle takes approximately five minutes to complete.

The polling interval configured on the **Administration > System > System Tasks** tab specifies the frequency of inventory collection.



CHAPTER 4

Provisioning VMs

- [VM Provisioning on HyperFlex Pods, on page 19](#)
- [Virtual Data Centers on HyperFlex Pods, on page 19](#)
- [ReadyClone VMs on HyperFlex Pods, on page 19](#)

VM Provisioning on HyperFlex Pods

You have two options for provisioning VMs on a HyperFlex pod. The option you choose depends upon how many VMs you want to provision at one time and whether you want to enable your end users to provision VMs on a HyperFlex pod.

- VDC-based VMs enable a user with administrative permissions or your end users to provision one VM at a time.
- ReadyClone VMs enable a user with administrative permissions to provision multiple VMs at a time. ReadyClone VMs perform rapid cloning of many VMs through HyperFlex technology. All of these VMs must be based on the same VM template. See the [Cisco HyperFlex Data Platform Management Guide](#) for more information about ReadyClone VMs on Cisco HX Data Platform.

Virtual Data Centers on HyperFlex Pods

You can use a Virtual Data Center (VDC) to provision a VM on a HyperFlex pod through the standard Cisco UCS Director VM provisioning process. If you provision VMs with VDCs, you must ensure that all HyperFlex VDCs have the recommended configuration.

See the [Cisco UCS Director Administration Guide](#) for more information about VDCs and how to provision VMs.

ReadyClone VMs on HyperFlex Pods

ReadyClone VMs enable you to rapidly create and customize multiple cloned VMs from the same VM template. When the cloning operation is complete, the ReadyClone VM is a separate guest VM with its own operating system.

Changes made to a ReadyClone VM do not affect the VM template. A ReadyClone VM's MAC address and UUID are different from those of the VM template.

For more information about the features, benefits, best practices, and guidelines for ReadyClone VMs, see the [Cisco HyperFlex Data Platform Management Guide](#).

Guidelines for VM Provisioning with ReadyClone VMs

Review the following guidelines before you provision the VMs using ReadyClone.

Required User Permissions

You must have Cisco UCS Director administrative privileges to provision ReadyClone VMs in the Cisco UCS Director Admin Portal.

VM Template Must Meet HyperFlex Guidelines

The VM template that you use to create ReadyClone VMs must meet the guidelines provided in the [Cisco HyperFlex Data Platform Management Guide](#).

Maximum Number of VMs to Be Provisioned at One Time

You can simultaneously provision between 1 and 256 ReadyClone VMs from a single VM template.

Guest Operating System Restrictions

All VMs provisioned with ReadyClone must use the same customization specification in VMware vCenter for the guest operating system (OS) settings. The guest OS can be either Linux or Windows.

ReadyClone Check box Availability

To provision a VM through ReadyClone:

- Check the ReadyClone check box during Storage Policy configuration.
- Check the ReadyClone check box during Catalog creation.
- When using a Standard Catalog for provisioning, verify that the selected image is on an HX datastore, and the VM does not have multiple disks and VMware snapshots.

If this condition is not met, you will receive an error message when you use ReadyClone option to provision a VM.

Provisioning VMs with ReadyClone VMs

Before you begin

- Create the desired VM templates in VMware vCenter.
- (Optional) Create a customization specification in VMware vCenter to specify the guest OS settings for all VMs.
- Make sure that the datastore with the VM template is mounted on all of the hosts in the HX cluster.

- The space required for the number of VMs being provisioned must be less than the free space available on the datastore to avoid provisioning failure.

-
- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **VM Templates**.
- Step 4** Click the row with the VM template on which you want to base the ReadyClone VMs and then click **Create ReadyClone VMs**.
- Step 5** On the **Create HyperFlex ReadyClone VMs** screen, complete the required fields, including the following:
- In the **Number of Clones** field, enter the number of VMs that you want to provision from this template.
You can provision a minimum of one VM and a maximum of 256 VMs.
 - (Optional) From the **Customization Spec Name** drop-down list, choose the name of the customization specification that you want to use for the cloned VMs.
The customization specification can include either Linux or Windows guest OS settings. See the [Cisco HyperFlex Data Platform Management Guide](#).
 - (Optional) Expand the **Resource Pool Name** field, click the row with the resource pool that you want to use for the VMs and then click **Select**.
 - In the **VM Name Prefix** field, enter the prefix that you want to use for the VM names.
 - In the **Guest Name Prefix** field, enter the prefix that you want to use for the guest host VM names.
 - In the **Start clone number** field, enter the number that you want to use for the first VM created.
The system appends this number to the name prefix of the first VM clone. For example, if you choose **clone** for the VM name prefix and **1** for the start clone number, the first VM is named **clone1**.
 - In the **Increment clone number** field, enter the number by which you want to increment all subsequent clones.
For example, if the first VM is named **clone1** and you enter **1** for the increment clone number, all subsequent VM names are incremented by 1, such as **clone2**, **clone3**, and so on.
 - Check **Power ON after deploy** if you want the guest VMs to automatically turn on after the cloning process is complete.
- Step 6** Check **Protect VM** if you want the guest VMs to be protected using replication to a paired cluster. See [Protecting VMs, on page 43](#). This option appears only if the existing cluster is part of a replication pair. The replication pair is automatically discovered. If you choose to protect the VM, complete the following fields:
- Choose the **Protection Type**:
Add to an existing protection group
You are prompted to select from the protection groups on the cluster. Click **Select**, choose a protection group, and click **Select**.
Protect this virtual machine independently
Specify a protection schedule solely for the cloned VMs. Continue with the next substep.
 - Choose an **Interval** between backups. Choices range from 15 minutes to 24 hours.
 - Choose from **Protect now or later**:
Now
Protect the cloned VMs immediately.

Later

Specify when protection is to begin using the date and time drop-downs.

- d) Check **Use VMware Tools to quiesce the virtual machine** if you want the VMs to be replicated in a quiescent state.

Step 7

Click **Submit**.

Note You can also provision VMs through ReadyClones by:

- Running the **HyperFlex ReadyClone Workflow** task. See [Automation with Orchestration Workflows, on page 35](#)
- Using **Clone VM**. See [Cloning a VM chapter in Cisco UCS Director Administration Guide](#).

What to do next

You can view the following:

- Status of the service request for the VM provisioning. On the **HyperFlex** page, choose the pod and then click **Service Requests**.
- Provisioned VMs. On the **HyperFlex** page, choose the pod and then click **VMs**.



CHAPTER 5

Managing HyperFlex Pods

- [Reports for HyperFlex Pods, on page 23](#)
- [HyperFlex Clusters, on page 26](#)
- [ESXi Hosts, on page 30](#)
- [Managing HX Servers, on page 31](#)
- [Managing Datastores, on page 31](#)
- [Managing VMs, on page 32](#)

Reports for HyperFlex Pods

Cisco UCS Director provides several different kinds of reports that you can use to view the current status of a pod and its components or to see how the pod or its component have performed over time. 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 pod or its components. These reports display in bar, pie, and tabular chart widgets on **Summary** pages.
- Tabular reports for detailed information about specific components.
- Trend graphs for information about the performance of pod resources over time.
- Stack views for a graphical bar view of the infrastructure in a VM.
- More reports include Top 5 reports and other reports for detailed information about high-performing pod resources. You can customize some of these reports.

Summary Reports

Summary reports enable you to view the status of your HyperFlex pods and to manage inventory lifecycle actions for the pods and their components. Each report displays as a widget on a **Summary** page at the pod level and the cluster level.

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.

The summary reports for All Pods comparison include the following in graphical and tabular formats:

- Active VM Distribution by Pod
- Total Storage Capacity by Pod (in GB)
- Overview

The summary reports for each HyperFlex pod include the following in graphical and tabular formats:

- Storage Capacity of the Pod (in GB)
- Cluster Nodes in Active vs Maintenance/Failed
- Active VMs vs Inactive VMs
- Summary of the pod components, including software versions and cluster status
- Storage Capacity Summary
- ESXi Host Versions

For more information about summary reports and reporting in Cisco UCS Director, see the [Cisco UCS Director Administration Guide](#).

Tabular Reports

Tabular reports provide the status of the components in a HyperFlex pod. 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 HyperFlex pod. Reports are available for the following components:

- Clusters
- ESXi Hosts
- Datastores
- VM Templates
- VMs
- Service Requests

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

Stack Views for VMs

Stack views provide information about a HyperFlex VM in a graphical format, including the compute, network, and storage configuration and resources available to that VM.

The stack view data includes:

	Compute	Network	Storage
OS	OS installed on the VM	OS installed on the VM	OS installed on the VM
VM	VM name	VM name	VM name
		Network adapter and port	Virtual disk
Hypervisor	Hypervisor version, IP address, and cluster	Hypervisor version, IP address, and cluster	Hypervisor version, IP address, and cluster
		Port group and VLAN	Datastore
		VSwitch	
Infrastructure	Server where the VM is located		HX Storage Cluster where the VM is located

To access the stack view, choose **VMs**, choose a VM, and then click **Stack View**.

Inventory Collection

When you add a HyperFlex pod, Cisco UCS Director discovers and collects the inventory of that pod. You can view the collected inventory and the status of the HyperFlex pod and its components in the summary reports and on the report pages. This status can be updated on a regular schedule through system tasks and manually by component.

Scheduled Refresh of Inventory Collection Through System Tasks

The HyperFlex system tasks enable you to schedule inventory collection for each HyperFlex pod. Depending on your business needs, you can set the same schedule for all HyperFlex pods or you can set a different schedule for some pods. You can specify the number of hours or minutes to automatically run the inventory collection and update the status of the HyperFlex pod.

For more information about scheduling system tasks, see the [Cisco UCS Director Administration Guide](#).

Manual Refresh of Inventory Collection

Even if you have scheduled inventory collection with system tasks, you can manually perform an inventory collection for a HyperFlex pod or its components. For example, you can manually refresh the inventory and status in the following ways:

- **Refresh**—Updates the data in summary reports and tabular reports. This action is available for a HyperFlex pod and its components, such as clusters, controller nodes, datastores, disks, and VMs.
- **Inventory Collection**—Performs an inventory collection for a component of a pod. This action is available for individual components, such as a VM, an ESXi host, or an HX Server.

HyperFlex Clusters

A HyperFlex (HX) cluster is a group of Cisco HX-Series Servers. Each Cisco HX-Series Server in the cluster is referred to as a node or host, and must be configured identically to ensure failover works correctly. You can use Cisco UCS Director to view and manage the following components of your HX Cluster:

- Cluster Summary
- Controller Nodes
- vSwitches

The **HX Cluster Consistent** column provides information regarding whether the vSwitch configuration is consistent across HX Cluster Nodes. The cluster is consistent if the vSwitch exists on each node, the vSwitch has the same number of uplinks and the uplinks have the same configuration, and the vSwitch has the same security configuration.

- DvSwitches

The **HX Cluster Consistent** column provides information regarding whether the DvSwitch configuration exists across HX Cluster Nodes.

- HX Servers
 - Disk Details
- Port Groups
 - VMs
- Dv Port Groups
 - VMs
- Physical NICs
 - VMs
- vmkNICs
- VLANs

The **Delete VLAN** unassociates the selected VLAN from the respective vNICs and then deletes the VLAN associated to the service profile or service profile templates.

Creating a Port Group

The **Create a Port Group** task creates a new port group for the VM on the selected vSwitch. It also provides an option to create a VLAN on Cisco UCS and updates all of the vNICs of HyperFlex cluster nodes.

Step 1 Choose **Hyper Converged > HyperFlex**.

Step 2 On the **HyperFlex** page, choose the pod.

Step 3 On the **HyperFlex** page, click **Clusters**.

Step 4 Click the row with the cluster that you want to manage and click **View Details**.

Step 5 Click **Port Groups**.

Step 6 Click **Create**.

Step 7 On the **Create Port Group** screen, complete the required fields, including the following:

- a) Expand **Select vSwitch** and check the box for the vSwitch on which you want to create the VM port group.

Note Port groups are created on all hosts in the HX Cluster for the selected vSwitch even though you can select only one vSwitch at a time.

If you receive an error message "vSwitch is not consistent across all hosts", verify that the selected vSwitch exists on all hosts in the HX Cluster by checking **HX Cluster Consistent** column for the vSwitch on which you are trying to create the VM Port Group.

If the vSwitch is not consistent across all the hosts in the HX Cluster, go to VMware vCenter and configure the vSwitch on the remaining hosts. Verify that the selected vSwitch is consistent across all hosts in the HX Cluster and create the VM port group.

- b) **Connection Types** drop-down list is set to VM port group by default.

- c) In the **Port Group Name** field, enter a unique name for the VM port group.

- d) In the **VLAN ID** field, specify a numeric value between [1-3967] or [4048-4093] for a VLAN ID to associate it with the port group.

- A value of zero creates the port group but does not update the associated vNICs.

- To use an existing VLAN, enter that VLAN ID and check **Use Existing VLAN on UCS**. Click **Submit**.

If the value entered for the VLAN ID does not exist on the Cisco UCS, you receive an error message. Go to next step to create a VLAN.

- e) Check **Create VLAN on UCS** to create a new VLAN on Cisco UCS and complete the following fields:

- **VLAN Name**

- **Fabric ID:**

- **Common/Global**—A common/global VLAN is created on Cisco UCS.

- **Fabric A**—A VLAN is created under Fabric A on Cisco UCS.

- **Fabric B**—A VLAN is created under Fabric B on Cisco UCS.

Step 8 Click **Submit**.

Deleting a Port Group

Step 1 Choose **Hyper Converged > HyperFlex**.

Step 2 On the **HyperFlex** page, choose the pod.

Step 3 On the **HyperFlex** page, click **Clusters**.

- Step 4** Click the row with the cluster that you want to manage and click **View Details**.
- Step 5** Click **Port Groups**.
- Step 6** Click the row with the port group with a VLAN ID that you want to delete and from the **More Actions** drop-down list, choose **Delete**.
- Step 7** On the **Delete Port Group** screen, complete the fields to delete the port group:
- From the **UCS VLAN Name** drop-down list, choose the Cisco UCS VLAN that you want to delete.
Choose a value of **None**, if you do not want to delete the Cisco UCS VLAN.
 - Check **Delete even if VM Mappings exist** box if you have VMs associated with the port group. The VMs must be in power-off state.

If the box is left unchecked, you can only delete the port groups that do not have VMs associated with it otherwise you receive an error message.
- Step 8** Click **Delete** to delete the selected Port group.
-

Creating a Dv Port Group

This task creates a new Dv port group on the selected vSwitch. It also provides an option to create a VLAN on Cisco UCS and updates all of the vNICs of HyperFlex cluster nodes.

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **Clusters**.
- Step 4** Click the row with the cluster that you want to manage and click **View Details**.
- Step 5** Click **Dv Port Groups**.
- Step 6** Click **Create**.
- Step 7** On the **Create Dv Port Group** screen, complete the required fields, including the following:
- Expand **DvSwitch Name** and check the DvSwitch for which you want to create the Dv port group.
 - In the **Dv Port Group Name** field, enter a unique name for the Dv port group.
 - From the **Port Binding** drop-down list, choose from the following options to determine when ports are assigned to virtual machines connected to this distributed port group:
 - **Static Binding**—Assigns a port immediately and reserves it for the VM, guaranteeing connectivity. The port is disconnected when the VM is removed from the port group. This is the default binding type.

Note This option automatically sets the port allocation type as elastic. The default number of ports is eight. When all ports are assigned, a new set of eight ports is created.

It is recommend that you choose static port binding option for better performance. See VMware documentation for best practices.
 - **Dynamic Binding**—Assigns a port to a VM when the virtual machine is powered on and its NIC is in a connected state. The port is disconnected when the VM is powered off or the NIC of the virtual machine is disconnected.

- **Ephemeral - No Binding**—Creates a port and assigns it to a VM when the virtual machine is powered on and its NIC is in a connected state. When the VM powers off or the NIC of the virtual machine is disconnected, the port is deleted. This option gives you the flexibility to manage VM connections even when vCenter is down.

- d) In the **Number of Ports** field, enter a numeric value between [0-8192] for the number of ports that can be created within the Dv port group.

If you chose **Static Binding**, the default value is 8. If you chose **Dynamic Binding**, the default value is 128. If you chose **Ephemeral**, this field is not displayed.

However, you can edit the number of ports as per your environment.

- e) In the **VLAN ID** field, enter a numeric value between [1-3967] or [4048-4093] for a VLAN ID to associate it with the Dv port group.

- A value of zero specifies that the VLAN is not associated with the port group being created. This is the default value.
- To use an existing VLAN, enter that VLAN ID and check **Use Existing VLAN on UCS**. Click **Submit**.

Note If the value entered for the VLAN ID does not exist on the Cisco UCS, you receive an error message. Go to next step to create a new VLAN.

- f) Check **Create VLAN on UCS** to create a new VLAN on Cisco UCS and complete the following fields:

- **VLAN Name**
- **Fabric ID**—Choose from the following options:
 - **Common/Global**—A common/global VLAN is created on Cisco UCS.
 - **Fabric A**—A VLAN is created under Fabric A on Cisco UCS.
 - **Fabric B**—A VLAN is created under Fabric B on Cisco UCS.

Step 8 Click **Submit**.

Deleting a Dv Port Group

Step 1 Choose **Hyper Converged > HyperFlex**.

Step 2 On the **HyperFlex** page, choose the pod.

Step 3 On the **HyperFlex** page, click **Clusters**.

Step 4 Click the row with the cluster that you want to manage and click **View Details**.

Step 5 Click **Dv Port Groups**.

Step 6 Click the row with the port group with a VLAN ID that you want to delete and from the **More Actions** drop-down list, choose **Delete**.

Step 7 On the **Delete Dv Port Group** screen, complete the fields to delete the port group:

- a) From the **UCS VLAN Name** drop-down list, choose the Cisco UCS VLAN that you want to delete.

Choose a value of **None**, if you do not want to delete the Cisco UCS VLAN.

- b) Check **Delete even if VM Mappings exist** box if you have VMs associated with the port group. The VMs must be in power-off state.

If the box is left unchecked, you can only delete the port groups that do not have VMs associated with it otherwise you receive an error message.

Step 8 Click **Delete** to delete the selected Port group.

ESXi Hosts

Cisco UCS Director supports all ESXi host operations on HyperFlex as it does for converged infrastructure. In addition, it supports the following ESXi host operations only for HyperFlex:

- ESXi HX Maintenance mode
- Reboot Host
- Collect Inventory

Managing ESXi Hosts on a HyperFlex Pod

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **ESXi Hosts**.
- Step 4** Choose an ESXi host and click one of the following:
- **ESXi HX Maintenance mode**
 - **Reboot Host**
 - **Collect Inventory**
-

Moving ESXi Hosts into and out of ESXi Maintenance Mode

See the [Cisco HyperFlex Data Platform Management Guide](#) for information about ESXi maintenance mode for ESXi hosts on HyperFlex.



Note Cisco UCS Director supports only ESXi maintenance mode for ESXi hosts on HyperFlex. Cisco UCS Director does not support Cisco HX maintenance mode. To use Cisco HX maintenance, right-click on the ESXi host in VMware vCenter and follow the prompts.

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.

- Step 3** On the **HyperFlex** page, click **ESXi Hosts**.
- Step 4** Choose the ESXi host that you want to move into or out of maintenance mode and click **ESXi HX Maintenance mode**.
- Step 5** On the **ESXi HX Maintenance mode** screen in **ESXi Action**, choose one of the following:
- **enter**
 - **exit**
- Step 6** Click **Submit**.
-

Managing HX Servers

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **Clusters**.
- Step 4** Choose the cluster where the HX Servers are located and click **View Details**.
- Step 5** On the cluster details page, click **HX Servers**.
- Step 6** Choose the HX Server that you want to manage and click one of the following:
- **Power ON**
 - **Power OFF**
 - **Reset**
 - **Launch KVM Console**
 - **KVM Direct Access**
 - **Request Inventory Collection**
 - **View Details**
-

Managing Datastores

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **Datastores**.
- Step 4** Click the row with the datastore that you want to manage and click one of the following:
- **Create**
 - **Delete**
 - **Edit**
 - **Mount**
 - **Unmount**

You can also click **View Details** on the datastore to access additional information and service request details for that datastore.

Managing VMs

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, 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.

Note These options are not available on storage controller VMs.

- **Access VM Credentials**
- **Launch VM Client**
- **Launch VNC Console**
- **VMRC Console (HTML5)**
- **Assign VM**
- **Configure Lease Time**
- **Resize VM**
- **Power ON**
- **Power OFF**
- **Suspend**
- **Shutdown Guest**
- **Standby**
- **Reset**
- **Reboot**
- **Create Snapshot**
- **Mount ISO Image As CD/DVD Drive**
- **Revert Snapshot**
- **Mark Golden Snapshot**
- **Delete Snapshot**
- **Delete All Snapshots**
- **VM Disk Resize**
- **Inventory Collection Request for VM**
- **Create VM Disk**
- **Delete VM Disk**
- **Add vNICs**
- **Delete vNICs**
- **Configure VNC**
- **Unconfigure VNC**
- **Test VNC**

- **Clone**
- **VM Resync**
- **Move VM to VDC**
- **Migrate VM**
- **Clone VM as Image**
- **Convert VM as Image**
- **Enable/Disable VMRC Console**
- **Assign VMs to VDC**

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, CD ROMs, VM access data, and linked clone VMs. These details are specific to features and actions related to VMware vCenter.

For detailed information about these features and actions, see the [Cisco UCS Director VMware vSphere Management Guide](#).

Note The **Linked Clone VMs** report does not provide any information about VMs that are provisioned through Readyclones. This report is populated only for VMs that are provisioned through Linked Clone.



CHAPTER 6

Automating HyperFlex Provisioning and Management

- [Automation with Orchestration Workflows, on page 35](#)
- [Predefined Workflows for HyperFlex, on page 35](#)
- [Viewing Predefined Workflows in the Workflow Designer, on page 36](#)
- [Predefined Workflow Tasks for HyperFlex, on page 37](#)
- [Opening the Task Library, on page 38](#)

Automation with Orchestration Workflows

Cisco UCS Director includes orchestration workflows and tasks that enable you to automate common VM provisioning and HyperFlex management tasks in one or more workflows. You can create a workflow that combines HyperFlex tasks with VMware host tasks and Cisco UCS tasks for Cisco UCS Manager.

Depending on the permissions required to perform a task, you can create workflows to be executed in Cisco UCS Director by an administrator or in the End User Portal by a user. For example, a workflow to provision ReadyClone VMs requires administrator permissions and cannot be executed by an end user.

See the [Cisco UCS Director Orchestration Guide](#) for details about orchestration workflows, tasks, and other orchestration and automation concepts.

Predefined Workflows for HyperFlex

Cisco UCS Director provides a set of simple, predefined workflows for HyperFlex. These workflows are designed to perform a single task, such as creating ReadyClone VMs or creating a datastore.

If you want to automate more complex provisioning or management tasks, you can make a copy of a predefined workflow and add tasks to the copy of that workflow. You can also create your own custom workflows that include HyperFlex tasks.



Note If you want to modify a predefined workflow, we recommend that you create a new version of that workflow before making the changes. If you modify a default predefined workflow, you can impact what happens in Cisco UCS Director when you click an action button. Actions that you take in Cisco UCS Director for a HyperFlex System, such as creating or mounting a datastore, use the default predefined workflows.

For example, when you click the **Mount** button for a datastore, Cisco UCS Director runs the Mount HyperFlex Datastore workflow and creates a service request for the action.

Location of Predefined HyperFlex Workflows

To access all predefined HyperFlex workflows, go to **Orchestration**, click **Workflows**, and then click **HyperFlex**.

List of Predefined HyperFlex Workflows

The predefined HyperFlex workflows include the following:

- Create HyperFlex Datastore—Creates a datastore with the specified name and size in TB, GB, or MB.
- Create HyperFlex ReadyClones—Creates the specified number of ReadyClones from a given VM template.
- Create HyperFlex VM DV Port Group—Creates a VM DV port group.
- Create HyperFlex VM Port Group—Creates a VM Port group on a given host and vSwitch.
- Create HyperFlex VMKernel Port Group—Creates a VMkernel port group on the selected vSwitch.
- Delete HyperFlexDatastore—Deletes the specified datastore.
- Delete HyperFlex VM Port Group—Deletes a VM Port group on a given host and vSwitch.
- Edit HyperFlex Datastore—Changes the size of the specified datastore.
- HyperFlex Esxi Host Action—Sets the host standby, reboot, and shutdown power actions.
- HyperFlex Esxi Host Maintenance Mode—Enters or Exits ESXi maintenance mode.
- Modify HyperFlex Port Group—Modifies a HX port group.
- Modify HyperFlex VM Port Group—Modifies a HX VM port group.
- Modify HyperFlex VMKernel Port Group—Modifies a HX VMkernel port group.
- Mount HyperFlex Datastore—Mounts the specified datastore.
- Unmount HyperFlex Datastore—Unmounts the specified datastore.

Viewing Predefined Workflows in the Workflow Designer

Step 1 Choose **Orchestration**.

Step 2 On the **Orchestration** page, click **Workflows**.

Step 3 Expand the **HyperFlex** folder.

Step 4 Double-click one of the workflows to open it in the Workflow Designer.

Step 5 Double-click a workflow task to view the properties of that task.

You can drag and drop additional tasks into the workflow. You can also execute or validate the workflow.

Predefined Workflow Tasks for HyperFlex

Cisco UCS Director provides a set of predefined workflow tasks that you can use to create workflows to provision VMs and manage datastores. These tasks are configured with a set of inputs and outputs that mirror the settings you must configure if you perform the tasks manually.

The Cisco UCS Director task library provides a list of the available HyperFlex tasks. The task library includes a description of each task's function and its inputs and outputs.

Location of the Predefined HyperFlex Tasks

All predefined HyperFlex tasks are available in the left pane of the Workflow Designer when you have a workflow open. The tasks are in the following location: **Physical Storage Tasks > HyperFlex Tasks**.

List of Predefined HyperFlex Tasks

The predefined HyperFlex tasks include the following:

- Create HyperFlex Datastore—Creates a datastore with the specified name and size in TB, GB, or MB.
- Edit HyperFlex Datastore—Changes the amount of storage allocated to the specified datastore.
- Mount HyperFlex Datastore—Mounts the specified datastore.
- Unmount HyperFlex Datastore—Unmounts the specified datastore.
- Delete HyperFlex Datastore—Deletes the specified datastore.



Note A datastore must be unmounted before it can be deleted.

- Create HyperFlex ReadyClones of a VM—Creates the specified number of ReadyClones from a given VM template.
- HX Esxi Host Maintenance Mode—Puts an ESX server in a storage cluster into HX maintenance mode. This task can perform both entry to and exit from the maintenance mode.
- Validate create port group inputs—Validates the inputs to create a port group.
- Validate modify port group inputs—Validates the inputs to modify a port group.
- Update vNICs—Update vNICs.
- Delete Port Group—Deletes a port group from a vSwitch. After deletion, all the VMs associated with that port group are associated with the default port group and vSwitch of that host.

- Validate create VMKernel port group inputs—Validates the inputs to create a VMKernel port group.
- Validate create DV port group inputs—Validates the inputs to create a Dv port group.

If these tasks do not include the functionality you need, you can customize your tasks with advanced scripting capabilities. You can also create your own custom tasks.

Opening the Task Library

- Step 1** Choose **Orchestration**.
 - Step 2** On the **Orchestration** page, click **Workflows**.
 - Step 3** Click **Task Library**.
 - Step 4** Check **Regenerate Document** to update the task library with any new tasks, including custom and open automation tasks.
 - Step 5** Click **Submit**.
 - Step 6** Scroll down to the **HyperFlex Tasks** section and click one of the hyperlinked tasks to view its details.
-



CHAPTER 7

Protecting VMs

- [VM Backup and Recovery, on page 39](#)
- [Viewing a Replication Pair, on page 40](#)
- [Creating a Protection Group, on page 41](#)
- [Changing a Protection Schedule, on page 42](#)
- [Protecting VMs, on page 43](#)
- [Unprotecting VMs, on page 44](#)

VM Backup and Recovery

Cisco UCS Director's integration with Cisco HyperFlex enables you to set up cluster-to-cluster data protection on Cisco HyperFlex pods.

With Cisco UCS Director, you can perform the following tasks:

- Create HyperFlex protection groups to schedule replication of groups of VMs
- Modify VM replication schedules, individually or by protection group
- Add and remove VMs to and from a protection group
- Protect VMs individually
- View HyperFlex replication pairs, replication networks, and protection groups
- View the replication status of HyperFlex VMs

The following configuration must be done in Cisco HX Connect:

- Creating replication pairs
- Configuring a replication network

Restoring VMs from snapshots after a disaster must be done in Cisco HX Connect.

See "Managing Virtual Machine Disaster Recovery" in the [Cisco HyperFlex Data Platform Administration Guide](#).

Viewing a Replication Pair

You can view HyperFlex replication entities of every level in Cisco UCS Director, including:

- Clusters
- Replication pairs
- Replication networks
- Protection groups
- VMs

The VM protection functionality in Cisco UCS Director is accessible at the level of replication pairs. To view a replication pair, do the following:

Before you begin

Create a replication pair between a HyperFlex source cluster and a HyperFlex target cluster. See "Managing Virtual Machine Disaster Recovery" in the [Cisco HyperFlex Data Platform Administration Guide](#).

-
- Step 1** Choose **Hyper Converged > HyperFlex**.
 - Step 2** On the **HyperFlex** page, choose the pod.
 - Step 3** On the **HyperFlex** page, click **Clusters**.
 - Step 4** Choose the primary or source cluster.
 - Step 5** Click the **View Details** action.
 - Step 6** On the **HyperFlex Cluster Details** page, click **Protect**.
 - Step 7** From the HyperFlex Cluster Details page, choose a replication pair.

Note The HyperFlex replication pairs shown on this page are from the perspective of the source cluster you chose in Step [Step 4, on page 40](#). From this perspective, the **Remote Cluster** is the cluster *on which* outgoing VM replications are placed, and *from which* incoming VMs images are transmitted to be replicated on the current cluster.

- Step 8** Click the **View Details** action.
- Step 9** On the Replication Pair page, you can now click to view:

Summary

Graphical summaries of the source cluster VMs, replication networks, protection groups and VMs, and replication pairs.

Replication Pair

A report of all replication pairs associated with the source cluster.

Note Currently only one-to-one pairing of clusters is allowed for replication, so there is only one replication pair displayed.

Note The replication pair information is also available on the Primary Cluster page from which you selected the replication pair.

Replication Network

The parameters of the replication network associated with the replication pair.

You can click to view and manage:

Protection Groups

A report of all protection groups associated with the replication pair.

VMs

All VMs in the source or target cluster.

Creating a Protection Group

You can create protection groups that specify a replication schedule on the source cluster of a replication pair. All VMs that belong to the protection group are replicated to the target cluster according to the replication schedule.

Before you begin

Create a replication pair between a HyperFlex source cluster and a HyperFlex target cluster. You create protection groups on the source cluster. See "Managing Virtual Machine Disaster Recovery" in the [Cisco HyperFlex Data Platform Administration Guide](#).

-
- Step 1** Choose **Hyper Converged > HyperFlex**.
 - Step 2** On the **HyperFlex** page, choose the pod.
 - Step 3** On the **HyperFlex** page, click **Clusters**.
 - Step 4** Choose the primary or source cluster.
 - Step 5** Click the **View Details** action.
 - Step 6** On the **HyperFlex Cluster Details** page, click **Protect**.
 - Step 7** Choose a replication pair.
 - Step 8** Click the **View Details** action.
 - Step 9** Click **Protection Groups**.
 - Step 10** Click the **Add** action.
 - Step 11** On the **Create Protection Group** page, complete the following fields:

Name

(Required.) Enter a name for the protection group.

Interval

(Required.) Choose a time interval between replications. Intervals range from 15 minutes to 24 hours. The shorter the interval, the more up-to-date the snapshot is in case of disaster recovery, at the cost of more server resource consumption.

Protect now or later

(Required.) Choose either **Now** or **Later**. If you choose **Now**, replication begins immediately. If you choose **Later**, replication begins at the next scheduled instance of the interval.

Use VMware tools to quiesce the virtual machine

If checked, then VMs are suspended before they are replicated. If unchecked, then VMs are snapshotted in their current state, even if active.

Step 12 Click **Submit**.

What to do next

Add VMs to the protection group. See [Protecting VMs, on page 43](#).

Changing a Protection Schedule

You can modify HyperFlex protection groups to change the scheduling of replication of the VMs in the group.

Before you begin

Create a replication pair between a HyperFlex source cluster and a HyperFlex target cluster. You create protection groups on the source cluster. See "Managing Virtual Machine Disaster Recovery" in the [Cisco HyperFlex Data Platform Administration Guide](#).

Create at least one protection group.

Step 1 Choose **Hyper Converged > HyperFlex**.

Step 2 On the **HyperFlex** page, choose the pod.

Step 3 On the **HyperFlex** page, click **Clusters**.

Step 4 Choose the primary or source cluster.

Step 5 Click the **View Details** action.

Step 6 On the **HyperFlex Cluster Details** page, click **Protect**.

Step 7 Choose a replication pair.

Step 8 Click the **View Details** action.

Step 9

- To change the schedule for a protection group, click **Protection Groups**.
- To change the schedule for an individual VM, click **VMs**.

Step 10 Choose a protection group or a protected VM.

Note You cannot modify the protection schedule for an unprotected VM. To protect a VM, you must select the VM and click **Protect VM**, then select **Protect this machine independently** or **Add to an existing protection group**.

Step 11 Click the **Edit Schedule** action.

Step 12 On the **Edit Protection Group (or VM)** page, complete the following fields:

Name

You cannot rename an existing protection group.

Interval

(Required.) Choose a time interval between replications. Intervals range from 15 minutes to 24 hours. The shorter the interval, the more up-to-date the snapshot is in case of disaster recovery, at the cost of more server resource consumption.

Protect now or later

(Required.) Choose either **Now** or **Later**. If you choose **Now**, replication begins immediately. If you choose **Later**, replication begins at the next scheduled instance of the interval.

Use VMware tools to quiesce the virtual machine

If checked, then VMs are suspended before they are replicated. If unchecked, then VMs are snapshotted in their current state, even if active.

Step 13 Click **Submit**.

For a protection group, the new schedule applies to all VMs currently in the protection group and to any VMs subsequently added to the protection group. For an individually selected VM, the schedule applies only to that VM.

Protecting VMs

You can protect individual VMs from disaster by replicating the VMs between two HyperFlex clusters making up a replication pair. To protect more than one VM on the same schedule, add the VMs to a protection group. See [Creating a Protection Group, on page 41](#).

Before you begin

Create a replication pair between a HyperFlex source cluster and a HyperFlex target cluster. You create protection groups on the source cluster. See "Managing Virtual Machine Disaster Recovery" in the [Cisco HyperFlex Data Platform Administration Guide](#). Create VMs on the source cluster that you want to protect.

Optional: Create at least one protection group.

-
- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **Clusters**.
- Step 4** Choose the primary or source cluster.
- Step 5** Click the **View Details** action.
- Step 6** On the **HyperFlex Cluster Details** page, click **Protect**.
- Step 7** Choose a replication pair.
- Step 8** Click the **View Details** action.
- Step 9** Click **VMs**.
- Step 10** Choose an unprotected VM.
- Step 11** Click the **Protect VM** action.
- Step 12** You can protect a VM individually or by adding it to a protection group.
- To protect the VM as part of a group, select **Add to an existing protection group** from the **Protection Type** drop-down menu. Proceed to the next step.
 - To protect an individual VM, choose **Protect this virtual machine independently** from the **Protection Type** drop-down menu. Skip the next step. See [Creating a Protection Group, on page 41](#).
- Step 13** Do the following to add the VM to a protection group:
- a) For **Protection Group**, click **Select**.
 - b) Choose a protection group by checking it in the **Protection Group** report.
 - c) Click **Select**.

- Step 14** To protect the VM, specify its replication schedule by completing the rest of the Protect VM dialog:
- For **Interval**, choose the backup interval.
 - For Protect now or later, choose **Now** or **Later**.
 - If you chose **Later**, specify a protection time using the **Protection Time** calendar and clock controls.
 - Optionally, check **Use VMware Tools to quiesce the virtual machine**.
 - Click **Submit**.
-

Unprotecting VMs

You unprotect VMs by either removing them from a protection group or removing their individually assigned replication schedule.

Before you begin

Create a replication pair between a HyperFlex source cluster and a HyperFlex target cluster. You create protection groups on the source cluster. See "Managing Virtual Machine Disaster Recovery" in the [Cisco HyperFlex Data Platform Administration Guide](#).

Create at least one VM and protect it individually (See [Protecting VMs, on page 43](#)) or create at least one protection group with at least one VM in it. See [Creating a Protection Group, on page 41](#).

- Step 1** Choose **Hyper Converged > HyperFlex**.
- Step 2** On the **HyperFlex** page, choose the pod.
- Step 3** On the **HyperFlex** page, click **Clusters**.
- Step 4** Choose the primary or source cluster.
- Step 5** Click the **View Details** action.
- Step 6** On the **HyperFlex Cluster Details** page, click **Protect**.
- Step 7** Choose a replication pair.
- Step 8** Click the **View Details** action.
- Step 9** Click **VMs**.
- Step 10** Choose a protected VM:
- A VM that is part of a protection group. Its **Protected** status value is **Protected** and its protection group is listed under the **Protection Group** heading.
 - A VM that is protected individually. Its **Protected** status value is **Protected** and its **Protection Group** value is **None**.
- Step 11** Click the **UnProtect VM** action.
- Step 12** In the confirmation dialog, click **Submit**.
-