



Cisco UCS Director HyperFlex Systems Management Guide, Release 6.0

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Preface

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Audience

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

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

Conventions

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

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

**Note**

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

**Caution**

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

**Tip**

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

**Timesaver**

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

**Warning****IMPORTANT SAFETY INSTRUCTIONS**

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

SAVE THESE INSTRUCTIONS

Related Documentation

Cisco UCS Director Documentation Roadmap

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

Cisco UCS Documentation Roadmaps

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

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

**Note**

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

Documentation Feedback

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

Obtaining Documentation and Submitting a Service Request

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

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



Overview

- [Integration between Cisco UCS Director and Cisco HyperFlex System, page 1](#)
- [Cisco UCS Director, page 1](#)
- [Cisco HyperFlex HX-Series Systems, page 3](#)

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 have configured 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

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 network 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, as needed, basis.

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:

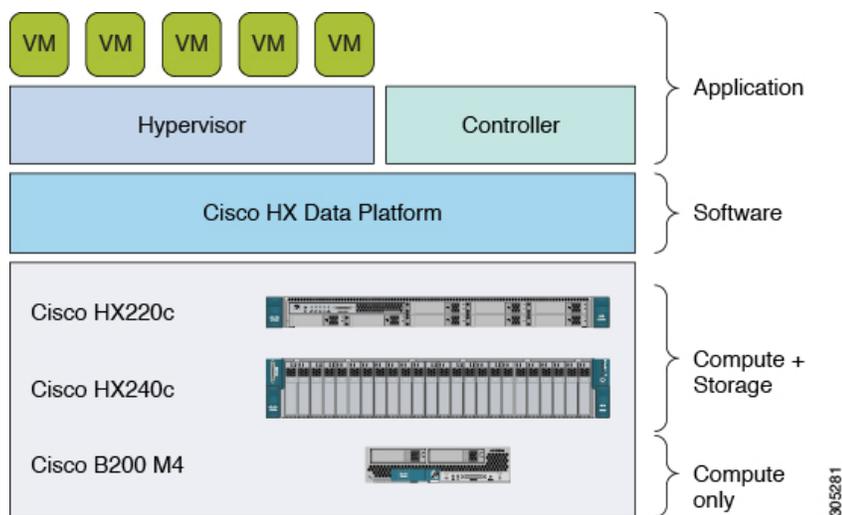
- VM provisioning and lifecycle management
- Network resource configuration and lifecycle management
- Storage resource configuration and lifecycle management
- Tenant onboarding and infrastructure configuration
- Application infrastructure provisioning
- Self-service catalogs and VM provisioning

- Bare metal server provisioning, including installation of an operating system

Cisco HyperFlex HX-Series Systems

Cisco HyperFlex HX-Series Systems are hyperconverged systems, that combine 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-Series appliance nodes under one umbrella, instead of scaling up by adding drives or CPUs. This hyperconverged system provides a unified pool of resources based on your workload needs.

Figure 1: Overview of the 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 2

Setting Up a HyperFlex Pod

- [Prerequisites, page 5](#)
- [HyperFlex Pod Configuration, page 6](#)
- [Creating a HyperFlex Pod in Cisco UCS Director, page 7](#)
- [Manual Configuration of HyperFlex Pod in Cisco UCS Director, page 8](#)

Prerequisites

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

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
(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 7

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 8

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 5.

-
- Step 1** On the menu bar, choose **Administration > Guided Setup**.
- Step 2** Double-click **HyperFlex Pod Configuration** 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**. 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**.
- Click the **Add** button and complete the fields to create a new HyperFlex pod.
 - From the **Pod** drop-down list, choose an existing HyperFlex pod.
- 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:
 - IP address or FQDN of Cisco UCS Manager

- Username and password for a valid Cisco UCS Manager account with administrative privileges
- Transport type
- Port used to access that address

The remaining fields on the screen are optional.

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 8](#).

c) Click **Next**.

Step 7 On the **Cisco HyperFlex** screen, complete the fields to create a Cisco HX Data Platform account for the pod. To create a new account, you need the following:

- Cluster management IP address
- Username and password for a valid HyperFlex account with administrative privileges
- Transport type
- Port used to access the cluster address
- HTTPS port and SSH port that use the same HyperFlex credentials

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 5](#).

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 9](#). 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 Cloud, on page 10](#).

Step 3 Add (or select a pre-existing) a Cisco UCS Manager account. See [Adding a Cisco UCS Manager Account, on page 13](#). 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 16](#)

Adding a Pod

Step 1 On the menu bar, choose **Administration > Physical Accounts**.

Step 2 Click the **Pods** tab.

Step 3 Click **Add**.

Step 4 In the **Add Pod** dialog box, 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 Cloud

When creating a 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** dialog box and in the credential policy form results in an error.

Step 1 On the menu bar, choose **Administration > Virtual Accounts**.

Step 2 Choose the **Virtual Accounts** tab.

Step 3 Click **Add (+)**.

Step 4 In the **Add Cloud** dialog box, complete the following fields:

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>

Name	Description
Cloud Name field	The cloud name. The name cannot include single quotes. 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.
Server Address field	The vCenter server 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.
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. You can also click Add to create a new credential policy. This field is only displayed if you choose to use a credential policy.
Server User ID field	The vCenter server username. This field is only displayed if you choose to use a credential policy.
Server Password field	The vCenter server password. This field is only displayed if you choose to use a credential policy.
Server Access Port field	The server port number. This field is only displayed if you choose to use a credential policy.
Server Access URL field	The URL for the server access. This field is only displayed if you choose to use a credential policy.
VMware Datacenter field	The data center name on the vCenter account.
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.
Discover Datacenters / Clusters check box	Check this box to discover and use any VMware datacenters and associated VMware clusters.

Name	Description
Select Datacenters / Clusters field	<p>Check the associated datacenters and clusters you want to use.</p> <p>Note This field is visible only when you check the Discover Datacenters / Clusters check box.</p>
Enable SRM check box	<p>Check this box to enable Site Recovery Manager (SRM) for the account.</p>
Primary SRM Server Address field	<p>The IP address of the primary SRM server.</p> <p>Note This field is visible only when you check the Enable SRM check box.</p>
Primary SRM Server User ID field	<p>The user ID for the primary SRM server.</p> <p>Note This field is visible only when you check the Enable SRM check box.</p>
Primary SRM Server Password field	<p>The password of the user for the primary SRM server.</p> <p>Note This field is visible only when you check the Enable SRM check box.</p>
Primary SRM Server Access Port field	<p>The port number for the primary SRM server. For SRM version 6.0, enter 9086 as the port number.</p> <p>Note This field is visible only when you check the Enable SRM check box.</p>
Remote SRM Server User ID field	<p>The user ID for the remote SRM server.</p> <p>Note This field is visible only when you check the Enable SRM check box.</p>
Remote SRM Server Password field	<p>The password of the user ID for the remote SRM server.</p> <p>Note This field is visible only when you check the Enable SRM check box.</p>
Use SSO check box	<p>Check this check box to use Single Sign-On (SSO) for authentication.</p> <p>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.</p>
SSO Server Address field	<p>The IP address of the Single-Sign On server.</p> <p>Note This field is visible only when you check the Use SSO check box.</p>
SSO Server User ID field	<p>The user ID for the SSO server.</p> <p>Note This field is visible only when you check the Use SSO check box.</p>

Name	Description
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.
Description field	The description of the cloud.
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 On the menu bar, choose **Administration > Physical Accounts**.

Step 2 Click the **Physical Accounts** tab.

Step 3 Click **Add**.

Step 4 In the **Add Account** dialog box, 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

In the **Add Account** dialog box, 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+.
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.

Name	Description
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.
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 On the menu bar, choose **Administration > Physical Accounts**.

Step 2 Choose the **Physical Accounts** tab.

Step 3 Click **Add**.

Step 4 In the **Add Account** dialog box, 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 In the **Add Account** dialog box, 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.
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.

Name	Description
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.
SSH Port field	Enter SSH port number to execute CLI commands. This field is not displayed if you choose to use a credential policy.
Contact field	The contact email address for the account.
Location field	The location.

Step 7 Click **Add**.

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.



Provisioning VMs

- [VM Provisioning on HyperFlex Pods, page 19](#)
- [Virtual Data Centers on HyperFlex Pods, page 19](#)
- [ReadyClone VMs on HyperFlex Pods, page 20](#)

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 your end users to be able to provision VMs on a HyperFlex pod.

- VDC-based VMs enable a user with administrative permissions or your end users to create one VM at a time. Some HyperFlex-specific configuration is required in the VDC and its related policies.
- ReadyClone VMs enable a user with administrative permissions to provision multiple VMs at one time. ReadyClone VMs perform rapid cloning of many VMs through HyperFlex technology, rather than the one and many VMware technology. All of these VMs must be based on the same VM template. See the [Cisco HyperFlex Systems Administration 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 Systems Administration Guide](#).

Guidelines for VM Provisioning with ReadyClone VMs

Before you provision one or more ReadyClone VMs, review the following guidelines. For more information about ReadyClone VMs, see the Using HX Data Platform ReadyClones chapter of the [Cisco HyperFlex Systems Administration Guide](#).

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 Systems Administration 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 ReadyClone VMs that you provision at the same time must use the same customization specification in VMware vCenter for the guest operating system (OS) settings in all VMs. The guest OS can be either Linux or Windows.

Provisioning VMs with ReadyClone VMs

Before You Begin

- Create the desired VM templates in VMware vSphere.

- (Optional) Create a customization specification in VMware vSphere to specify the guest OS settings for all VMs.

-
- Step 1** On the menu bar, choose **HyperConverged > HyperFlex**.
- Step 2** In the **Navigation** pane, choose the HyperFlex pod where you want to provision the VMs.
- Step 3** Click the **Clusters** tab.
- Step 4** Choose the cluster where you want to provision the VMs and click **View Details**.
- Step 5** Click the **VM Templates** tab.
- Step 6** Choose the VM template on which you want to base the ReadyClone VMs and click **Create ReadyClone VMs**.
- Step 7** In the **Create HyperFlex ReadyClone VMs** dialog box, complete the following fields:
- a) 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.
 - b) (Optional) In the **Customization Spec Name** field, enter 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 Systems Administration Guide](#).
 - c) (Optional) In the **Resource Pool Name** field, click **Select** and choose the resource pool that you want to use for the VMs.
 - d) In the **VM Name Prefix** field, enter the prefix that you want to use for the VM names.
 - e) In the **Guest Name Prefix** field, enter the prefix that you want to use for the guest host VM names.
 - f) 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 will be named **clone1**.
 - g) 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** in this field, all subsequent VM names are incremented by 1, such as **clone2**, **clone3**, and so on.
 - h) Check the **Power ON After Deploy** checkbox if you want the guest VMs to automatically turn on after the cloning process is completed.
- Step 8** Click **Submit**.
-

What to Do Next

You can view the following:

- Status of the service request for the VM provisioning in **Organizations > Service Requests**.
- Provisioned VMs on the **VMs** tab for the HyperFlex pod.



Managing HyperFlex Pods

- [Reports for HyperFlex Pods, page 23](#)
- [HyperFlex Clusters, page 26](#)
- [ESXi Hosts, page 26](#)
- [Managing HX Servers, page 28](#)
- [Managing Datastores, page 28](#)
- [Managing VMs, page 29](#)

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** tabs.
- Tabular reports for detailed information about specific components. These reports display in tabs.
- Trend graphs for information about the performance of pod resources over time. These reports display in tabs.
- Stack views for a graphical bar view of the infrastructure in a VM. These reports display in a pop-up window.
- More reports include top 5 reports and other reports for detailed information about high-performing pod resources. These reports display in tabs. You can customize some of these reports.

Summary Reports

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

You can customize your **Summary** tabs 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 a HyperFlex pod include the following in graphical and tabular formats:

- Storage capacity of the pod
- Cluster nodes in active vs maintenance/failed state
- Active VMs vs inactive VMs
- Summary of the pod components, including software versions and cluster status
- 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 on any tab after you choose the HyperFlex pod. Reports are available for the following components:

- Clusters
 - ESXi hosts
 - VM templates
 - HX servers
- Controller nodes
- Datastores
- Disks
- VMs

For some components, such as clusters, you can click on 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		HyperFlex storage cluster where the VM is located

To access the stack view, choose the VM on the **VMs** tab 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 allow 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** button—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** button—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. You can use Cisco UCS Director to view and manage the following components of your HX clusters:

- ESXi hosts
- VM templates
- HX servers

ESXi Hosts

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

- Enter Maintenance Mode
- Exit Maintenance Mode
- Reboot Host
- Collect Inventory

Managing ESXi Hosts on a HyperFlex Pod

-
- Step 1** On the menu bar, choose **HyperConverged > HyperFlex**.
- Step 2** in the **Navigation** pane, choose the HyperFlex pod with the ESXi hosts that you want to manage.
- Step 3** Click the **Clusters** tab.
- Step 4** Choose the cluster where the ESXi hosts are located and click **View Details**.
- Step 5** Click the **ESXi Hosts** tab.
- Step 6** Choose an ESXi host and click one of the following:
- **Enter Maintenance Mode**
 - **Exit Maintenance Mode**
 - **Reboot Host**

- **Collect Inventory**
-

Moving ESXi Hosts into and out of ESXi Maintenance Mode

See the [Cisco HyperFlex Systems Administration 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** On the menu bar, choose **HyperConverged > HyperFlex**.
- Step 2** in the **Navigation** pane, choose the HyperFlex pod where you want to provision the VMs.
- Step 3** Click the **Clusters** tab.
- Step 4** Choose the cluster where you want to provision the VMs and click **View Details**.
- Step 5** Click the **ESXi Hosts** tab.
- Step 6** Choose the ESXi host that you want to move into or out of maintenance mode and click one of the following:
- **Enter Maintenance Mode**
 - **Exit Maintenance Mode**
- Step 7** If you chose to enter maintenance mode, complete the following fields in the **Enter Maintenance Mode** dialog box:
- a) From the **Maintenance Mode** drop-down list, choose one of the following:
 - **Ensure accessibility** -- This is the default host maintenance mode. All accessible virtual machines on the host remain accessible when the host is either powered off or removed from the cluster. Partial data migration is performed.
 - **Full data migration** -- This host maintenance mode consumes the most time and resources. VMware moves all data to other hosts in the cluster and fixes availability compliance for the affected components in the cluster. This option can be used to permanently migrate a host. The host cannot enter maintenance mode if a virtual machine object has data on the host, and is not accessible and cannot be fully migrated. When migrating data from the last host in the cluster, you must make sure that you migrate the virtual machines to another datastore, and then put the host in maintenance mode.
 - **No data migration** -- This host maintenance mode does not migrate any data from the host. If the host is powered off or removed from the cluster, some virtual machines may become inaccessible.
 - b) Check **Remove from vCenter** if you want to remove the host from VMware vCenter.
 - c) Click **Submit**.
-

Managing HX Servers

- Step 1** On the menu bar, choose **HyperConverged > HyperFlex**.
- Step 2** in the **Navigation** pane, choose the HyperFlex pod where you want to manage the HX servers.
- Step 3** Click the **Clusters** tab.
- Step 4** Choose the cluster where the HX servers are located and click **View Details**.
- Step 5** Click the **HX Servers** tab.
- 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**
-

Managing Datastores

- Step 1** On the menu bar, choose **HyperConverged > HyperFlex**.
- Step 2** in the **Navigation** pane, choose the HyperFlex pod where you want to manage the datastores.
- Step 3** Click the **Clusters** tab.
- Step 4** Choose the cluster where the datastores are located and click **View Details**.
- Step 5** Click the **Datastores** tab.
- Step 6** Choose 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** On the menu bar, choose **HyperConverged > HyperFlex**.
- Step 2** in the **Navigation** pane, choose the HyperFlex pod with the VMs that you want to manage.
- Step 3** Click the **VMs** tab.
- Step 4** Choose the cluster where the VMs are located and click **View Details**.
- Step 5** Click the **VMs** tab.
- Step 6** Choose the VM that you want to manage and click one of the following options:
Some of these options are available only if you click the drop-down list on the right of the menu bar.
- **Access VM Credentials**
 - **Launch VM Client**
 - **Assign VM**
 - **Configure Lease Time**
 - **Resize VM**
 - **Power ON**
 - **Power OFF**
 - **Delete VM**
 - **Suspend**
 - **Shutdown Guest**
 - **Standby**
 - **Reset**
 - **Reboot**
 - **Create Snapshot**
 - **Mount ISO Image**
 - **Revert Snapshot**
 - **Mark Golden Snapshot**
 - **Delete Snapshot**
 - **Delete All Snapshots**
 - **VM Disk Resize**

- **Inventory Collection**
- **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 Access**
- **Assign VMs to VDC**

You can also click **View Details** on the VM 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.

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



Automating HyperFlex Provisioning and Management

- [Automation with Orchestration Workflows, page 31](#)
- [Predefined Workflows for HyperFlex, page 31](#)
- [Viewing Predefined Workflows in the Workflow Designer, page 32](#)
- [Predefined Workflow Tasks for HyperFlex, page 32](#)
- [Opening the Task Library, page 33](#)

Automation with Orchestration Workflows

Cisco UCS Director includes orchestration workflows and tasks that allow 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 upon 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

All predefined HyperFlex workflows are available in the **HyperFlex** folder on the **Workflows** tab.

List of Predefined HyperFlex Workflows

The predefined HyperFlex workflows include the following:

- Create HyperFlex ReadyClones—Creates the specified number of ReadyClones from a given VM template.
- Create HyperFlex Datastore—Creates a datastore with the specified name and size in TB, GB, or MB.
- Delete HyperFlex Datastore—Deletes the specified datastore.
- Edit HyperFlex Datastore—Changes the size of the specified datastore.
- Mount HyperFlex Datastore—Mounts the specified datastore.
- Unmount HyperFlex Datastore—Unmounts the specified datastore.

Viewing Predefined Workflows in the Workflow Designer

-
- Step 1** On the menu bar, choose **Policies > Orchestration**.
- Step 2** In the **Workflows** column, expand the **HyperFlex** folder.
- Step 3** Double-click one of the workflows to open it in the Workflow Designer.
- Step 4** Double-click on the 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 folder: **Physical Storage Tasks > HyperFlex Tasks**.

List of Predefined HyperFlex Tasks

The predefined HyperFlex tasks include the following:

- Create HyperFlex ReadyClones of a VM—Creates the specified number of ReadyClones from a given VM template.
- Create HyperFlex Datastore—Creates a datastore with the specified name and size in TB, GB, or MB.
- Delete HyperFlex Datastore—Deletes the specified datastore.
- Edit HyperFlex Datastore—Changes the size of the specified datastore.
- Mount HyperFlex Datastore—Mounts the specified datastore.
- Unmount HyperFlex Datastore—Unmounts the specified datastore.

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

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- | | |
|---------------|---|
| Step 1 | On the menu bar, choose Policies > Orchestration . |
| Step 2 | Click Task Library . |
| Step 3 | Check Regenerate Document to update the task library with any new tasks, including custom and open automation tasks. |
| Step 4 | Click Submit . |
| Step 5 | Scroll down to the HyperFlex Tasks section and click on one of the hyperlinked tasks to view its details. |
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