



# Configure HyperFlex Hardware Acceleration Cards

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This chapter describes how to configure Cisco HyperFlex Hardware Acceleration Cards.

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## Overview of HyperFlex Hardware Acceleration Cards

This chapter provides details for installation, post-installation, and troubleshooting of HyperFlex Hardware Acceleration Cards (PID: HX-PCIE-OFFLOAD-1) on HyperFlex nodes and for configuring your initial cluster. These cards provide improved performance and compression efficiency for most storage workloads.



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**Note** An HXDP-P Enterprise license is required for installing and configuring HyperFlex Hardware Acceleration Cards.

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For a description of PCIe slots and riser cards (and other related information), please refer to the [Cisco HX240c M5 HyperFlex Node \(Hybrid and All-Flash Models\) Installation Guide](#).

## Install HyperFlex Hardware Acceleration Cards

### Before you begin

Before beginning the HyperFlex Hardware Acceleration Cards installation process, note the following:

- Installation is only supported on NEW deployments.

- Installation is only supported on the following HX 240 M5/M6 servers:
  - HXAF240C-M5SX Cisco HyperFlex HX240c M5 All Flash
  - HXAF240C-M6S Cisco HyperFlex HX240c M6 All Flash
  - HX240C-M5SX Cisco HyperFlex HX240c M5
  - HX240C-M6SX Cisco HyperFlex HX240c M6
  - HX240C-M5L HyperFlex HX240c M5 LFF
  - HX240C-M6S HyperFlex HX240c M6 LFF
- Installation is not supported in Hyper-V and is not supported for stretched clusters.
- All nodes in the HX cluster must contain the HyperFlex Hardware Acceleration Cards.



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**Note** If any nodes do not contain an acceleration card during validation, the installer fails to proceed and an error message appears.

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- The cluster type must be All Flash/Hybrid ESXi.
- Installation is only supported on HX 240 M5/M6 servers.
- Hardware Acceleration Cards do not work with Cisco HX Data Replication.

### Procedure

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- Step 1** Install the PCIe cards. This is a Cisco-assisted installation.
- Step 2** Configure your cluster using the HX installer. For more information, see:
- [Deploying HX Data Platform Installer OVA Using vSphere Web Client](#)
  - [Configure and Deploy your HX Cluster](#)
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## Deploy HX Data Platform Installer OVA Using vSphere Web Client

In addition to installing the HX Data Platform on an ESXi host, you may also deploy the HX Data Platform Installer on either VMware Workstation, VMware Fusion, or Virtual Box.



- Note**
- Connect to vCenter to deploy the OVA file and provide the IP address properties. Deploying directly from an ESXi host will not allow you to set the values correctly.
  - Do not deploy the HX Data Platform Installer to an ESXi server that is going to be a node in the Cisco HX Storage Cluster.

## Procedure

**Step 1** Locate and download the HX Data Platform Installer OVA from [Download Software](#). Download the HX Data Platform Installer to a node that is on the storage management network, which will be used for the HX Data Platform storage cluster.

Example:

```
Cisco-HX-Data-Platform-Installer-v3.5.1d-26363.ova
```

**Step 2** Deploy the HX Data Platform Installer using VMware hypervisor, to create a HX Data Platform Installer virtual machine.

**Note** Use a version of the virtualization platform that supports virtual hardware version 10.0 or greater.

vSphere is a system requirement. You can use either vSphere thick client, vSphere thin client, or vSphere Web Client. To deploy the HX Data Platform Installer, you can also use VMware Workstation, VMware Fusion, or VirtualBox.

- a) Open a virtual machine hypervisor, such as vSphere, VirtualBox, Workstation, or Fusion.
- b) Select the node where you want to deploy the HX Data Platform Installer.

**Important** Ensure that you provide user credentials while deploying the HX Installer OVA using vSphere Web Client.

- Using vSphere thick Client—Expand **Inventory list > Host > File > Deploy OVA**.
- Using vSphere Web Client—Expand **vCenter Inventory list > Hosts > Host > Deploy OVA**.

**Step 3** Select where the HX Data Platform Installer is located. Accept the defaults, and select the appropriate network.

**Step 4** Enter a static IP address for use by the HX Data Platform Installer VM.

- Note**
- Static IP Address is necessary even if DHCP is configured for the network. You need the static IP address to run the HX Data Platform Installer, to install the HX Data Platform, and to create the HX Data Platform storage cluster.
  - If your hypervisor wizard defaults to DHCP for assigning IP addresses to new VMs, then complete the steps in [Deploy the HX Data Platform Installer OVA with a Static IP Address](#), to install the HX Data Platform Installer VM with a static IP address. DNS must be reachable from the Installer VM.

Field	Description
Hostname	The hostname for this VM. Leave blank to try to reverse lookup the IP address.
Default Gateway	The default gateway address for this VM. Leave blank if DHCP is desired.
DNS	The domain name servers for this VM (comma separated). Leave blank if DHCP is desired.
IP Address	The IP address for this interface. Leave blank if DHCP is desired.
Netmask	The netmask or prefix for this interface. Leave blank if DHCP is desired.
Root Password	The root user password. This field is a required field.

**Step 5** Click **Next**. Verify if the options listed are correct and select **Power on after deployment**.

To power on the HX Data Platform Installer manually, navigate to the virtual machine list and power on the installer VM.

**Note** The preferred settings for the HX Data Platform Installer virtual machine is 3 vCPU and 4 GB of memory. Reducing these settings can result in 100% CPU usage and spikes for the host.

**Step 6** Click **Finish**. Wait for the HX Data Platform Installer VM to be added to the vSphere infrastructure.

**Step 7** Open the HX Data Platform Installer virtual machine console.

The initial console display lists the HX Data Platform Installer virtual machine IP address.

```
Data Platform Installer.
*****
You can start the installation by visiting
the following URL:
http://192.168.10.210
*****
Cisco-HX-Data-Platform-Installer login:
```

**Step 8** Use the URL to log in to the HX Data Platform Installer.

```
Example:
http://192.168.10.210
```

**Step 9** Accept the self-signed certificate.

**Step 10** Log in using the username **root** and the password you provided as part of the OVA deployment.

# Deploy the HX Data Platform Installer OVA with a Static IP Address

If your hypervisor wizard defaults to DHCP for assigning IP addresses to new VMs, deploy the HX Data Platform Installer using the following steps:

## Procedure

- Step 1** Install the VMware OVF Tool 4.1 or later on a node that is on the storage management network that will be used for the HX Data Platform storage cluster. See [OVF Tool Documentation](#) for more details.
- Step 2** Locate and download HX Data Platform installer OVA from [Download Software](#) on the node where VMware OVF was installed.
- Step 3** Deploy the downloaded HX Data Platform installer OVA, using the `ovftool` command. For example:

```
root@server:/tmp/test_ova# ovftool --noSSLVerify --diskMode=thin
--acceptAllEulas=true --powerOn --skipManifestCheck --X:injectOvfEnv
--datastore=qa-048-ssdl --name=rfsi_static_test1 --network='VM Network'
--prop:hx.3gateway.Cisco_HX_Installer_Appliance=10.64.8.1
--prop:hx.4DNS.Cisco_HX_Installer_Appliance=10.64.1.8
--prop:hx.5domain.Cisco_HX_Installer_Appliance=cisco
--prop:hx.6NTP.Cisco_HX_Installer_Appliance=10.64.8.5
--prop:hx.1ip0.Cisco_HX_Installer_Appliance=10.64.8.36
--prop:hx.2netmask0.Cisco_HX_Installer_Appliance=255.255.248.0
--prop:hx.7root_password.Cisco_HX_Installer_Appliance=mypassword
/opt/ovf/rfsi_test/Cisco-HX-Data-Platform-Installer-v1.7.1-14786.ova
vi://root:password@esx_server
```

The command deploys the HX Data Platform installer, powers on the HX Data Platform installer VM, and configures the provided static IP address. A sample of processing response:

```
Opening OVA source:
/opt/ovf/rfsi_test/Cisco-HX-Data-Platform-Installer-v1.7.1-14786.ova
Opening VI target: vi://root@esx_server:443/
Deploying to VI: vi://root@esx_server:443/
Transfer Completed
Powering on VM: rfsi_static_test
Task Completed
Completed successfully
```

DNS must be reachable from the Installer VM. The required command options for the static IP address to be configured successfully are:

Command	Description
powerOn	To power on the HX Data Platform installer VM after it is deployed.
X:injectOvfEnv	To insert the static IP properties onto the HX Data Platform installer VM.
prop:hx.3gateway.Cisco_HX_Installer_Appliance=10.64.8.1	Specify the appropriate gateway IP address.
prop:hx.4DNS.Cisco_HX_Installer_Appliance=10.64.1.8	Specify the appropriate DNS IP address.

Command	Description
prop:hx.5domain.Cisco_HX_Installer_Appliance=cisco	Specify the appropriate domain.
prop:hx.6NTP.Cisco_HX_Installer_Appliance=10.64.8.5	Specify the appropriate NTP IP address.
prop:hx.1ip0.Cisco_HX_Installer_Appliance=10.64.8.36	Specify the appropriate installer static IP address.
prop:hx.2netmask0.Cisco_HX_Installer_Appliance=255.255.248.0	Specify the appropriate netmask address.
prop:hx.7root_password.Cisco_HX_Installer_Appliance=mypassword	Specify the root user password.
/opt/ovf/rfsi_test/Cisco-HX-Data-Platform-Installer-v1.7.1-14786.ova	The source address of the HX Data Platform installer OVA.
vi://root:password@esx_server	The destination ESX server where the HX Data Platform installer VM is installed. Include the appropriate ESX server root login credentials.

## Configure and Deploy Your HyperFlex Cluster

### Enter Credentials

On the **Credentials** page, you can choose to import the required configuration data from a JSON file or input data into the required fields manually.



**Note** For first-time installation of a HyperFlex cluster, contact your Cisco representative to procure the factory preinstallation JSON file.

To perform cluster creation, by importing the configuration data from a *JSON configuration* file, do the following:

1. Click **Select a file** and choose your *JSON file* to load the configuration data. Select **Use Configuration**.
2. An **Overwrite Imported Values** dialog box displays if your imported values for Cisco UCS Manager are different. Select **Use Discovered Values**.

#### Procedure

**Step 1** In your web browser, enter the IP address or the node name for the HX Data Platform Installer VM. Click **Accept** or **Continue** to bypass any SSL certificate errors. On the HX Data Platform Installer login page, verify the HX Data Platform Installer **Build ID** in the lower right corner of the login screen.

**Step 2** In the login page, enter the following credentials:

**Username:** root

**Password** (Default): `Cisco123`

**Attention** Systems ship with a default password of `Cisco123` that must be changed during installation. You cannot continue installation unless you specify a new user supplied password.

**Step 3** Select the **I accept the terms and conditions** check box, and click **Login**.

**Step 4** On the **Select a Workflow** page, from the **Create Cluster** drop-down list, select **Standard Cluster**.

**Step 5** On the **Credentials** page, enter the following configuration data:

Field	Description
<b>UCS Manager Host Name</b>	Enter the UCS Manager FQDN or IP address. For example, <i>10.193.211.120</i> .
<b>UCS Manager User Name</b>	Enter the administrative username.
<b>Password</b>	Enter the administrative password.

#### vCenter Credentials

Field	Description
<b>vCenter Server</b>	Enter the vCenter server FQDN or IP address. For example, <i>10.193.211.120</i> .  <b>Note</b> <ul style="list-style-type: none"> <li>• A vCenter server is required before the cluster can be made operational.</li> <li>• The vCenter address and credentials must have root level administrator permissions to the vCenter.</li> <li>• vCenter server input is optional if you are building a nested vCenter. See the <a href="#">Nested vCenter TechNote</a> for more details.</li> </ul>
<b>User Name</b>	Enter the administrative username. For example, <i>administrator@vsphere.local</i> .
<b>Admin Password</b>	Enter the administrative password.

**Step 6** On the **Hypervisor Configuration** page, enter the following configuration data:

#### Hypervisor Credentials

Field	Description
<b>Admin User Name</b>	Enter the administrative username. The username is <b>root</b> for factory nodes.

Field	Description
<b>New Password</b>	<p><b>Important</b> You are required to change the factory default password for the hypervisor.</p> <p>Create a new password for the hypervisor using the following guidelines:</p> <ul style="list-style-type: none"> <li>• Must be 6 to 80 characters in length.</li> <li>• Must have 1 uppercase character, 1 lowercase character, 1 digit, and 1 special character.</li> <li>• If password starts with uppercase character, then 2 uppercase characters are required.</li> <li>• If password ends with a digit, then 2 digits are required.</li> </ul>
<b>Confirm New Password</b>	Re-enter the new password for the hypervisor.

**Step 7** Click **Continue** to begin associating HyperFlex Servers. See [Associate HyperFlex Servers](#).

## Associate HyperFlex Servers

On the **Server Selection** page, the **Configuration** pane on the right displays a detailed list of the **Credentials** used. The **Server Selection** page displays a list of unassociated HX servers under the **Unassociated** tab, and the list of discovered servers under the **Associated** tab.

Field	Description
<b>Locator LED</b>	Turn on to locate a server.
<b>Server Name</b>	Name assigned to the server.
<b>Status</b>	<ul style="list-style-type: none"> <li>• Inaccessible—</li> </ul>
<b>Model</b>	Displays the server model.
<b>Serial</b>	Displays the serial number of the server.
<b>Assoc State</b>	<ul style="list-style-type: none"> <li>• Associated</li> <li>• Unassociated</li> </ul>
<b>Service Profile</b> [Only for Associated Servers]	<p>Service profile assigned to the server.</p> <p><b>Note</b> Editing the HyperFlex Service Profile templates is not recommended.</p>



Field	Description
Actions	<ul style="list-style-type: none"> <li>• <b>Launch KVM Console</b>—Choose this option to launch the KVM Console directly from the HX Data Platform Installer.</li> <li>• <b>Disassociate Server</b>—Choose this option to remove a service profile from that server.</li> </ul>

### Before you begin

Ensure that you completed entering UCS Manager, vCenter, and Hypervisor credentials.

### Procedure

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- Step 1** Click the **Configure Server Ports** button to discover any new HX nodes. In the **Configure Server Ports** dialog box, list all ports to be configured as server ports. Click **Configure**.
- Note** Typically, the server ports are configured in Cisco UCS Manager before you start the configuration.
- Step 2** Select the servers under the **Unassociated** tab to include in the HyperFlex cluster.
- If HX servers do not appear in this list, check Cisco UCS Manager and ensure that they have been discovered.
- Note** If there are no unassociated servers, the following error message is displayed:
- ```
No unassociated servers found. Login to UCS Manager and ensure server ports are enabled.
```
- Step 3** Click **Continue** to configure UCS Manager. See [Configure UCS Manager](#).
- 

## Configure UCS Manager

On the **UCSM Configuration** page, you can configure VLAN, MAC Pool, 'hx-ext-mgmt' IP Pool for CIMC, iSCSi Storage, and FC Storage.

### Before you begin

Associate servers to the HyperFlex cluster. See [Associate HyperFlex Servers](#).

### Procedure

- 
- Step 1** In the **VLAN Configuration** section, complete the following fields:
- Note** Use separate subnet and VLANs for each of the following networks.

| Field                                               | Description |
|-----------------------------------------------------|-------------|
| <b>VLAN for Hypervisor and HyperFlex management</b> |             |

| Field                                     | Description                                            |
|-------------------------------------------|--------------------------------------------------------|
| VLAN Name                                 | hx-inband-mgmt                                         |
| VLAN ID                                   | Default—3091                                           |
| <b>VLAN for HyperFlex storage traffic</b> |                                                        |
| VLAN Name                                 | hx-storage-data                                        |
| VLAN ID                                   | Default—3092                                           |
| <b>VLAN for VM vMotion</b>                |                                                        |
| VLAN Name                                 | hx-vmotion                                             |
| VLAN ID                                   | Default—3093                                           |
| <b>VLAN for VM Network</b>                |                                                        |
| VLAN Name                                 | vm-network                                             |
| VLAN ID(s)                                | Default—3094<br>A comma-separated list of guest VLANs. |

**Step 2** In the **MAC Pool** section, configure **MAC Pool Prefix** by adding in two more hex characters (0-F).

**Note** Select a prefix that is not used with any other MAC address pool across all UCS domains.

Example:

00:25:B5:AO:

**Step 3** In the '**hx-ext-mgmt**' **IP Pool for CIMC** section, complete the following fields:

| Field              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IP Blocks</b>   | The range of management IP addresses assigned to the CIMC for each HyperFlex server. The IP addresses are specified as a range, and multiple blocks of IPs may be specified as a comma-separated list. Ensure you have at least one unique IP per server in the cluster. When selecting to use out-of-band, this range must fall into the same IP subnet used on the mgmt0 interfaces on the Fabric Interconnects.<br><br>For example, <i>10.193.211.124-127, 10.193.211.158-163.</i> |
| <b>Subnet Mask</b> | Specify the subnet mask for the IP range provided above.<br><br>For example, <i>255.255.0.0.</i>                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Gateway</b>     | Enter the Gateway IP address.<br><br>For example, <i>10.193.0.1.</i>                                                                                                                                                                                                                                                                                                                                                                                                                  |

The management IP addresses used to access the CIMC on a server can be either:

- **Out of band:** The CIMC management traffic traverses the Fabric Interconnect through the limited bandwidth management interface, mgmt0, on the Fabric Interconnect. This option is most commonly used and shares the same VLAN as the Fabric Interconnect management VLAN.
- **In-band:** The CIMC management traffic traverses the Fabric Interconnect through the uplink ports of the Fabric Interconnect. The bandwidth available for management traffic in this case would be equivalent to the Fabric Interconnect uplink bandwidth. If you are using the In-band option, the Cisco HyperFlex installer will create a dedicated VLAN for the CIMC management communication. This option is useful when large files such as a Windows Server installation ISO must be mounted to the CIMC for OS installation. This option is only available in the HyperFlex installer VM and is not available for deployments through Intersight.

**Step 4** Select either **Out of band** or **In-band** based on the type of connection you want to use for CIMC management access. If you select In-band, provide the VLAN ID for the management VLAN. Make sure to create the CIMC management VLAN in the upstream switch for seamless connectivity.

**Step 5** If you want to add external storage, configure **iSCSI Storage** by completing the following fields:

| Field                          | Description                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------------------|
| Enable iSCSI Storage check box | Select to configure iSCSI storage.                                                              |
| VLAN A Name                    | Name of the VLAN associated with the iSCSI vNIC, on the primary Fabric Interconnect (FI-A).     |
| VLAN A ID                      | ID of the VLAN associated with the iSCSI vNIC, on the primary Fabric Interconnect (FI-A).       |
| VLAN B Name                    | Name of the VLAN associated with the iSCSI vNIC, on the subordinate Fabric Interconnect (FI-B). |
| VLAN B ID                      | ID of the VLAN associated with the iSCSI vNIC, on the subordinate Fabric Interconnect (FI-A).   |

**Step 6** If you want to add external storage, configure **FC Storage** by completing the following fields:

| Field                       | Description                                                                                                                            |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Enable FC Storage check box | Select to enable FC Storage.                                                                                                           |
| WWxN Pool                   | A WWN pool that contains both WW node names and WW port names. For each Fabric Interconnect, a WWxN pool is created for WWPn and WWNN. |
| VSAN A Name                 | The name of the VSAN for the primary Fabric Interconnect (FI-A).<br>Default—hx-ext-storage-fc-a.                                       |

| Field              | Description                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>VSAN A ID</b>   | The unique identifier assigned to the network for the primary Fabric Interconnect (FI-A).<br><br><b>Caution</b> Do not enter VSAN IDs that are currently used on the UCS or HyperFlex system. If you enter an existing VSAN ID in the installer which utilizes UCS zoning, zoning will be disabled in your existing environment for that VSAN ID.     |
| <b>VSAN B Name</b> | The name of the VSAN for the subordinate Fabric Interconnect (FI-B).<br><br>Default— <code>hx-ext-storage-fc-b</code> .                                                                                                                                                                                                                               |
| <b>VSAN B ID</b>   | The unique identifier assigned to the network for the subordinate Fabric Interconnect (FI-B).<br><br><b>Caution</b> Do not enter VSAN IDs that are currently used on the UCS or HyperFlex system. If you enter an existing VSAN ID in the installer which utilizes UCS zoning, zoning will be disabled in your existing environment for that VSAN ID. |

**Step 7** In the **Advanced** section, do the following:

| Field                              | Description                                                                                                                                                                                                                                                                      |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>UCS Server Firmware Version</b> | Select the UCS firmware version to associate with the HX servers from the drop-down list. The UCS firmware version must match the UCSM version. See the latest <a href="#">Cisco HX Data Platform Release Notes</a> for more details.<br><br>For example, <code>3.2(1d)</code> . |
| <b>HyperFlex Cluster Name</b>      | Specify a user-defined name. The HyperFlex cluster name is applied to a group of HX Servers in a given cluster. The HyperFlex cluster name adds a label to service profiles for easier identification.                                                                           |
| <b>Org Name</b>                    | Specify a unique <i>Org Name</i> to ensure isolation of the HyperFlex environment from the rest of the UCS domain.                                                                                                                                                               |

**Step 8** Click **Continue** to configure the Hypervisor. See [Configure Hypervisor](#).

# Configure Hypervisor



**Note** Review the VLAN, MAC pool, and IP address pool information on the **Hypervisor Configuration** page, in the **Configuration** pane. These VLAN IDs may be changed by your environment. By default, the HX Data Platform Installer sets the VLANs as non-native. You must configure the upstream switches to accommodate the non-native VLANs by appropriately applying a trunk configuration.



**Attention** You can skip configuring Hypervisor in case of a reinstall, if ESXi networking has been completed.

## Before you begin

Configure VLAN, MAC Pool, and 'hx-ext-mgmt' IP Pool for Out-of-Band CIMC. If you are adding external storage, configure iSCSI Storage and FC Storage. Select the UCS Server Firmware Version and assign a name for the HyperFlex cluster. See [Configure UCS Manager](#).

## Procedure

**Step 1** In the **Configure Common Hypervisor Settings** section, complete the following fields:

| Field         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subnet Mask   | Set the subnet mask to the appropriate level to limit and control IP addresses.<br><br>For example, <i>255.255.0.0</i> .                                                                                                                                                                                                                                                                                                                                                              |
| Gateway       | IP address of gateway.<br><br>For example, <i>10.193.0.1</i> .                                                                                                                                                                                                                                                                                                                                                                                                                        |
| DNS Server(s) | IP address for the DNS Server.<br><br><b>Note</b> <ul style="list-style-type: none"> <li>• If you do not have a DNS server, do not enter a hostname in any of the fields on the <b>Cluster Configuration</b> page of the HX Data Platform Installer. Use only static IP addresses and hostnames for all ESXi hosts.</li> <li>• If you are providing more than one DNS server, check carefully to ensure that both DNS servers are correctly entered, separated by a comma.</li> </ul> |

**Step 2** On the **Hypervisor Settings** section, select **Make IP Addresses and Hostnames Sequential** to make the IP addresses sequential. Complete the following fields:

**Note** You can rearrange the servers using drag and drop.

| Field                    | Description                                                 |
|--------------------------|-------------------------------------------------------------|
| <b>Name</b>              | Name assigned to the server.                                |
| <b>Locator LED</b>       | Turn on to locate a server.                                 |
| <b>Serial</b>            | Displays the serial number of the server.                   |
| <b>Static IP Address</b> | Input static IP addresses and hostnames for all ESXi hosts. |
| <b>Hostname</b>          | Do not leave the hostname fields empty.                     |

**Step 3** Click **Continue** to configure IP Addresses. See [Configure IP Addresses](#).

## Configure IP Addresses

### Before you begin

Ensure that you completed configuring Hypervisor on the **Hypervisor Configuration** page. See [Configure Hypervisor](#).

### Procedure

**Step 1** On the **IP Addresses** page, select **Make IP Addresses Sequential** to make the IP Addresses sequential.

**Step 2** When you enter IP addresses in the first row for Hypervisor, Storage Controller (Management) and Hypervisor, Storage Controller (Data) columns, the HX Data Platform Installer incrementally autofills the node information for the remaining nodes. The minimum number of nodes in the storage cluster is three. If you have more nodes, use the **Add** button to provide the address information.

**Note** Compute-only nodes can be added only after the storage cluster is created.

For each HX node, enter the Hypervisor, Storage Controller, Management, and Data IP addresses. For the IP addresses, specify if the network belongs to the Data Network or the Management Network.

| Field                                | Description                                                                                                                                                 |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Management Hypervisor</b>         | Enter the static IP address that handles the Hypervisor management network connection between the ESXi host and the storage cluster.                        |
| <b>Management Storage Controller</b> | Enter the static IP address that handles the storage controller VM management network connection between the storage controller VM and the storage cluster. |

| Field                          | Description                                                                                                                                           |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data Hypervisor</b>         | Enter the static IP address that handles the Hypervisor data network connection between the ESXi host and the storage cluster.                        |
| <b>Data Storage Controller</b> | Enter the static IP address that handles the storage controller VM data network connection between the storage controller VM and the storage cluster. |

**Step 3** The IP address provided here are applied to one node in the storage cluster. In the event the node becomes unavailable the affected IP address is moved to another node in the storage cluster. All nodes must have a port configured to accept these IP addresses.

Provide the following IP addresses:

| Field                                     | Description                                                                                                                                |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Management Cluster Data IP Address</b> | Enter the management network IP address for the HX Data Platform storage cluster.                                                          |
| <b>Data Cluster Data IP Address</b>       | Enter the IP address of data network for the HX Data Platform storage cluster.                                                             |
| <b>Management Subnet Mask</b>             | Enter the subnet information for your VLAN and vSwitches.<br><br>Provide the management network value. For example, <i>255.255.255.0</i> . |
| <b>Data Subnet Mask</b>                   | Provide the network value for the data network. For example, <i>255.255.255.0</i> .                                                        |
| <b>Management Gateway</b>                 | Provide the network value for your management network. For example, <i>10.193.0.1</i> .                                                    |
| <b>Data Gateway</b>                       | Provide the network value for your data network. For example, <i>10.193.0.1</i> .                                                          |

**Step 4** Click **Continue** to configure the HyperFlex cluster. See [Configure Your HyperFlex Cluster](#).

## Configure Your HyperFlex Cluster

On the **Cluster Configuration** page, for the Cisco HX Storage Cluster complete the following fields to begin deploying the HyperFlex cluster.

### Before you begin

Ensure that you completed configuring IP addresses on the **IP Addresses** page. See [Configure IP Addresses](#).

## Procedure

**Step 1** In the **Cisco HX Cluster** section, complete the following fields:

| Field                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cluster Name</b>       | Specify a name for the HX Data Platform storage cluster.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Replication Factor</b> | Specify the number of redundant replicas of your data across the storage cluster. Set the replication factor to either 2 or 3 redundant replicas. <ul style="list-style-type: none"> <li>• For hybrid servers (servers that contain SSD and HDDs), the default value is 3.</li> <li>• For flash servers (servers that contain only SSDs), select either 2 or 3.</li> <li>• A replication factor of three is highly recommended for all environments except HyperFlex Edge. A replication factor of two has a lower level of availability and resiliency. The risk of outage due to component or node failures should be mitigated by having active and regular backups.</li> </ul> |

**Step 2** In the **Controller VM** section, create a new password for the Administrative User of the HyperFlex cluster. A default administrator username and password is applied to the controller VMs. The VMs are installed on all converged and compute-only nodes.

- Important**
- You cannot change the name of the controller VM or the controller VM's datastore.
  - Use the same password for all controller VMs. The use of different passwords is not supported.
  - Provide a complex password that includes 1 uppercase character, 1 lowercase character, 1 digit, 1 special character, and a minimum of 10 characters in total.
  - You can provide a user-defined password for the controller VMs and for the HX cluster to be created. For password character and format limitations, see the section on Guidelines for HX Data Platform Special Characters in the *Cisco HX Data Platform Management Guide*.

**Step 3** In the **vCenter Configuration** section, complete the following fields:

| Field                          | Description                                                        |
|--------------------------------|--------------------------------------------------------------------|
| <b>vCenter Datacenter Name</b> | Enter the vCenter datacenter name for the Cisco HyperFlex cluster. |
| <b>vCenter Cluster Name</b>    | Enter the vCenter cluster name.                                    |

**Step 4** In the **System Services** section, complete the following fields:



|                        |                                                                                                                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DNS Server(s)</b>   | A comma-separated list of IP addresses of each DNS server.                                                                                                                                                             |
| <b>NTP Server(s)</b>   | A comma-separated list of IP addresses of each NTP server.<br><br><b>Note</b> All hosts must use the same NTP server, for clock synchronization between services running on the storage controller VMs and ESXi hosts. |
| <b>DNS Domain Name</b> | DNS FQDN or IP address.                                                                                                                                                                                                |
| <b>Time Zone</b>       | The local time zone for the controller VM, to determine when to take scheduled snapshots. Scheduled native snapshot actions are based on this setting.                                                                 |

**Step 5** In the **Connected Services** section, select **Enable Connected Services** to enable Auto Support and Intersight Management.

| <b>Field</b>                                   | <b>Description</b>                                                                                                                                  |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Enable Connected Services (Recommended)</b> | Enables Auto Support and Intersight management. Log on to HX Connect to configure these services or selectively turn them <b>On</b> or <b>Off</b> . |
| <b>Send service ticket notifications to</b>    | Email address where SR notifications are sent when triggered by Auto Support.                                                                       |

**Step 6** In the **Advanced Configuration** section, do the following:

| <b>Field</b>                                              | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Jumbo frames</b><br><b>Enable Jumbo Frames</b>         | Check to set the MTU size for the storage data network on the host vSwitches and vNICs, and each storage controller VM.<br><br>The default value is 9000.<br><br><b>Note</b> To set your MTU size to a value other than 9000, contact Cisco TAC.                                                                                                                                                  |
| <b>Disk Partitions</b><br><b>Clean up Disk Partitions</b> | Check to remove all existing data and partitions from all nodes added to the storage cluster for manually prepared servers. Select this option to delete existing data and partitions. You must backup any data that should be retained.<br><br><b>Attention</b> Do not select this option for factory prepared systems. The disk partitions on factory prepared systems are properly configured. |

| Field                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Virtual Desktop (VDI)</b>                    | <p>Check for VDI only environments.</p> <p><b>Note</b> To change the VDI settings after the storage cluster is created, shut down or move the resources, make the changes (described in the steps below), then restart the cluster.</p> <p>The HyperFlex cluster by default is configured to be performance tuned for VSI workloads.</p> <p>You may change this performance customization by performing the following steps on your HyperFlex Data Platform cluster. To change the HyperFlex cluster from VDI to VSI workloads (and vice versa):</p> <p><b>WARNING:</b> A maintenance window is required as this will cause data to be unavailable while the cluster is offline.</p> <ol style="list-style-type: none"> <li><b>a.</b> Shut down the cluster (<code>stcli cluster shutdown</code>).</li> <li><b>b.</b> Edit the <code>storfs.cfg</code> in all the controller VMs to modify the <code>workloadType</code> to <code>Vsi</code> or <code>Vdi</code>.</li> <li><b>c.</b> Start the cluster (<code>stcli cluster start</code>) to enable the tune changes after the cluster is created.</li> </ol> |
| <b>(Optional) vCenter Single-Sign-On Server</b> | <p>This information is only required if the SSO URL is not reachable.</p> <p><b>Note</b> Do not use this field. It is used for legacy deployments.</p> <p>You can locate the SSO URL in vCenter by navigating to <b>vCenter Server &gt; Manage &gt; Advanced Settings &gt; key config.vpxd.sso.sts.uri</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Step 7** Click **Start** to begin deploying the HyperFlex cluster. The **Progress** page displays the progress of various configuration tasks.

**Caution** Do not skip validation warnings.

See the **Warnings** section for more details.

**What to do next**

- Some validation errors require you to go back and re-enter a parameter (for example, an invalid ESXi password, incorrect NTP server, bad SSO server, or other incorrect input). Click **Re-enter Values** to return to the **Cluster Configuration** page and resolve the issue.
- When complete, the HyperFlex servers are installed and configured. The deployed cluster status shows as **Online** and **Healthy**.
- Click **Launch HyperFlex Connect** to create datastores and manage your cluster.

## Verify Installation of HyperFlex Hardware Acceleration Cards

You can verify that you installed the HyperFlex Hardware Acceleration Card successfully as follows:

**Procedure**

**Step 1** Log in to the controller VM.

**Step 2** Find the following tunes file: `/opt/springpath/config/offload.tunes`.

**Note** The tunes file can only be seen by System Administrators and root users. If these users are able to access this file, the installation is successful. If you do not have System Administrator or root user permissions, you can verify that the installation is successful if there are no error messages or events in the UI.

## Troubleshoot HyperFlex Hardware Acceleration Cards

Troubleshoot post-installation HyperFlex Hardware Acceleration Card related issues as follows:

| Symptom                                                                                            | Workaround                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Although the cluster is operational, you may note generic alerts in the vCenter and HX Connect UI. | Contact your Cisco representative for assistance.                                                                                                                                                                                                                                 |
| The Cluster reports a pairing error when NR pairing is attempted.                                  | NR pairing is not allowed if either cluster is on release prior to 4.5(1a), and has been enabled with HX Hardware Acceleration Card.<br><br>NR pairing with HX Hardware Acceleration card is only supported if both the clusters in the pair have HX Hardware Acceleration Cards. |

# Additional Information on HyperFlex Hardware Acceleration Cards

Additional notes on HyperFlex Hardware Acceleration Cards include the following:

- Compression gain value can be seen in HX connect UI dashboard.
- Enhance performance for the 8K read workload using the following commands:
  - `root@ucs984scvm:~# echo 3 > /sys/module/fdma/parameters/decompress_min_t`
  - `root@ucs984scvm:~# echo 3 > /sys/module/fdma/parameters/decompress_max_t`