



Configuring the Fabric Interconnects

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Initial System Setup

The first time that you access a fabric interconnect in a Cisco UCS instance, a setup wizard prompts you for the following information required to configure the system:

- Installation method (GUI or CLI)
- Setup mode (restore from full system backup or initial setup)
- System configuration type (standalone or cluster configuration)
- System name
- Admin password
- Management port IP address and subnet mask
- Default gateway IP address
- DNS Server IP address

- Default domain name

Setup Mode

You can choose to either restore the system configuration from an existing backup file, or manually setup the system by going through the setup wizard. If you choose to restore the system, the backup file must be reachable from the management network.

System Configuration Type

You can configure a Cisco UCS instance to use a single fabric interconnect in a standalone configuration or to use a redundant pair of fabric interconnects in a cluster configuration.

A cluster configuration provides high availability. If one fabric interconnect becomes unavailable, the other takes over. Only one management port (Mgmt0) connection is required to support a cluster configuration; however, both Mgmt0 ports should be connected to provide link-level redundancy.

**Note**

The cluster configuration only provides redundancy for the management plane. Data redundancy is dependent on the user configuration and may require a third-party tool to support data redundancy.

To use the cluster configuration, the two fabric interconnects must be directly connected together using Ethernet cables between the L1 (L1-to-L1) and L2 (L2-to-L2) high availability ports, with no other fabric interconnects in between. This allows the two fabric interconnects to continuously monitor the status of each other and quickly know when one has failed.

Both fabric interconnects in a cluster configuration must go through the initial setup process. The first fabric interconnect to be setup must be enabled for a cluster configuration, then when the second fabric interconnect is setup, it detects the first fabric interconnect as a peer fabric interconnect in the cluster.

For more information, refer to the *Cisco UCS 6100 Series Fabric Interconnect Hardware Installation Guide*.

Management Port IP Address

In a standalone configuration, you must specify only one IP address and the subnet mask for the single management port on the fabric interconnect.

In a cluster configuration, you must specify the following three IP addresses in the same subnet:

- Management port IP address for fabric interconnect A
- Management port IP address for fabric interconnect B
- Cluster IP address

**Tip**

After the initial configuration, you can change the management IP port and the related subnet mask in the Cisco UCS Manager CLI. You cannot make this change in the Cisco UCS Manager GUI.

Performing an Initial System Setup for a Standalone Configuration

Before You Begin

- 1 Verify the following physical connections on the fabric interconnect:

- The console port is physically connected to a computer terminal or console server
- The management Ethernet port (mgmt0) is connected to an external hub, switch, or router

For more information, refer to the *Cisco UCS Hardware Installation Guide* for your fabric interconnect.

- 2 Verify that the console port parameters on the computer terminal (or console server) attached to the console port are as follows:

- 9600 baud
- 8 data bits
- No parity
- 1 stop bit

- 3 Collect the following information that you will need to supply during the initial setup:

- System name.
- Password for the admin account. Choose a strong password with at least one capital letter and one number. This password cannot be blank.
- Management port IP address and subnet mask.
- Default gateway IP address.
- DNS server IP address (optional).
- Domain name for the system (optional).

Procedure

- Step 1** Connect to the console port.
- Step 2** Power on the fabric interconnect.
You will see the power on self-test messages as the fabric interconnect boots.
- Step 3** At the installation method prompt, enter gui.
- Step 4** If the system cannot access a DHCP server, you are prompted to enter the following information:
 - IP address for the management port on the fabric interconnect
 - Subnet mask for the management port on the fabric interconnect
 - IP address for the default gateway assigned to the fabric interconnect

- Step 5** Copy the web link from the prompt into a supported web browser and go to the Cisco UCS Manager GUI launch page.
- Step 6** On the Cisco UCS Manager GUI launch page, select **Express Setup**.
- Step 7** On the **Express Setup** page, select **Initial Setup** and click **Submit**.
- Step 8** In the **Cluster and Fabric Setup Area**, select the **Standalone Mode** option.
- Step 9** In the **System Setup** Area, complete the following fields:

Field	Description
System Name field	The name assigned to the Cisco UCS instance In a standalone configuration, the system adds "-A" to the system name. In a cluster configuration, the system adds "-A" to the fabric interconnect assigned to fabric A, and "-B" to the fabric interconnect assigned to fabric B.
Admin Password field	The password used for the Admin account on the fabric interconnect. Use a strong password with at least one capital letter and one number. The password cannot be blank.
Confirm Admin Password field	The password used for the Admin account on the fabric interconnect.
Mgmt IP Address field	The static IP address for the management port on the fabric interconnect.
Mgmt IP Netmask field	The subnet mask for the management port on the fabric interconnect.
Default Gateway field	The IP address for the default gateway assigned to the management port on the fabric interconnect.
DNS Server IP field	The IP address for the DNS server assigned to the fabric interconnect.
Domain Name field	The name of the domain in which the fabric interconnect resides.

- Step 10** Click **Submit**.
A page displays the results of your setup operation.
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Initial System Setup for a Cluster Configuration

Performing an Initial System Setup on the First Fabric Interconnect

Before You Begin

- 1 Verify the following physical connections on the fabric interconnect:

- A console port on the first fabric interconnect is physically connected to a computer terminal or console server
- The management Ethernet port (mgmt0) is connected to an external hub, switch, or router
- The L1 ports on both fabric interconnects are directly connected to each other
- The L2 ports on both fabric interconnects are directly connected to each other

For more information, refer to the *Cisco UCS Hardware Installation Guide* for your fabric interconnect.

- 2 Verify that the console port parameters on the computer terminal (or console server) attached to the console port are as follows:

- 9600 baud
- 8 data bits
- No parity
- 1 stop bit

- 3 Collect the following information that you will need to supply during the initial setup:

- System name.
- Password for the admin account. Choose a strong password with at least one capital letter and one number. This password cannot be blank.
- Three static IP addresses: two for the management port on both fabric interconnects (one per fabric interconnect), and one for the cluster IP address used by Cisco UCS Manager.
- Subnet mask for the three static IP addresses.
- Default gateway IP address.
- DNS server IP address (optional).
- Domain name for the system (optional).

Procedure

- Step 1** Connect to the console port.
- Step 2** Power on the fabric interconnect.

You will see the power on self-test messages as the fabric interconnect boots.

Step 3 At the installation method prompt, enter `gui`.

Step 4 If the system cannot access a DHCP server, you are prompted to enter the following information:

- IP address for the management port on the fabric interconnect
- Subnet mask for the management port on the fabric interconnect
- IP address for the default gateway assigned to the fabric interconnect

Step 5 Copy the web link from the prompt into a web browser and go to the Cisco UCS Manager GUI launch page.

Step 6 On the Cisco UCS Manager GUI launch page, select **Express Setup**.

Step 7 On the **Express Setup** page, select **Initial Setup** and click **Submit**.

Step 8 In the **Cluster and Fabric Setup** Area:

- a) Click the **Enable Clustering** option.
- b) For the **Fabric Setup** option, select **Fabric A**.
- c) In the **Cluster IP Address** field, enter the IP address that Cisco UCS Manager will use.

Step 9 In the **System Setup** Area, complete the following fields:

Field	Description
System Name field	The name assigned to the Cisco UCS instance In a standalone configuration, the system adds "-A" to the system name. In a cluster configuration, the system adds "-A" to the fabric interconnect assigned to fabric A, and "-B" to the fabric interconnect assigned to fabric B.
Admin Password field	The password used for the Admin account on the fabric interconnect. Use a strong password with at least one capital letter and one number. The password cannot be blank.
Confirm Admin Password field	The password used for the Admin account on the fabric interconnect.
Mgmt IP Address field	The static IP address for the management port on the fabric interconnect.
Mgmt IP Netmask field	The subnet mask for the management port on the fabric interconnect.
Default Gateway field	The IP address for the default gateway assigned to the management port on the fabric interconnect.
DNS Server IP field	The IP address for the DNS server assigned to the fabric interconnect.
Domain Name field	The name of the domain in which the fabric interconnect resides.

- Step 10** Click **Submit**.
A page displays the results of your setup operation.
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Performing an Initial System Setup on the Second Fabric Interconnect

Before You Begin

You must ensure the following:

- A console port on the second fabric interconnect is physically connected to a computer terminal or console server
- You know the password for the admin account on the first fabric interconnect that you configured.

Procedure

- Step 1** Connect to the console port.
- Step 2** Power on the fabric interconnect.
You will see the power on self-test messages as the fabric interconnect boots.
- Step 3** At the installation method prompt, enter `gui`.
- Step 4** If the system cannot access a DHCP server, you are prompted to enter the following information:
- IP address for the management port on the fabric interconnect
 - Subnet mask for the management port on the fabric interconnect
 - IP address for the default gateway assigned to the fabric interconnect
- Step 5** Copy the web link from the prompt into a web browser and go to the Cisco UCS Manager GUI launch page.
- Step 6** On the Cisco UCS Manager GUI launch page, select **Express Setup**.
- Step 7** On the **Express Setup** page, select **Initial Setup** and click **Submit**.
The fabric interconnect should detect the configuration information for the first fabric interconnect.
- Step 8** In the **Cluster and Fabric Setup** Area:
- a) Select the **Enable Clustering** option.
 - b) For the **Fabric Setup** option, make sure **Fabric B** is selected.
- Step 9** In the **System Setup** Area, enter the password for the Admin account into the **Admin Password of Master** field.
- Step 10** Click **Submit**.
A page displays the results of your setup operation.
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Enabling a Standalone Fabric Interconnect for Cluster Configuration

You can add a second fabric interconnect to an existing Cisco UCS instance that uses a single standalone fabric interconnect. To do this, you must enable the standalone fabric interconnect for cluster operation, and then add the second fabric interconnect to the cluster.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# connect local-mgmt	Enters local management mode.
Step 2	UCS-A(local-mgmt) # enable cluster ip-addr	Enables cluster operation on the standalone fabric interconnect with the specified IP address. When you enter this command, you are prompted to confirm that you want to enable cluster operation. Type yes to confirm.

The following example enables a standalone fabric interconnect with IP address 192.168.1.101 for cluster operation:

```
UCS-A# connect local-mgmt
UCS-A(local-mgmt)# enable cluster 192.168.1.101
This command will enable cluster mode on this setup. You cannot change it
back to stand-alone. Are you sure you want to continue? (yes/no): yes
UCS-A(local-mgmt)#
```

What to Do Next

Add the second fabric interconnect to the cluster.

Ethernet Switching Mode

The Ethernet switching mode determines how the fabric interconnect behaves as a switching device between the servers and the network. The fabric interconnect operates in either of the following Ethernet switching modes:

End-Host Mode

End-host mode allows the fabric interconnect to act as an end host to the network, representing all server (hosts) connected to it through vNICs. This is achieved by pinning (either dynamically pinned or hard pinned) vNICs to uplink ports, which provides redundancy toward the network, and makes the uplink ports appear as server ports to the rest of the fabric. When in end-host mode, the fabric interconnect does not run the Spanning Tree Protocol (STP) and avoids loops by denying uplink ports from forwarding traffic to each other, and by denying egress server traffic on more than one uplink port at a time. End-host mode is the default Ethernet switching mode and should be used if either of the following are used upstream:

- Layer 2 switching for L2 Aggregation
- Virtual Switching System (VSS) aggregation layer

**Note**

When end-host mode is enabled, if a vNIC is hard pinned to an uplink port and this uplink port goes down, the system cannot re-pin the vNIC, and the vNIC remains down.

Switch Mode

Switch mode is the traditional Ethernet switching mode. The fabric interconnect runs STP to avoid loops, and broadcast and multicast packets are handled in the traditional way. Switch mode is not the default Ethernet switching mode, and should be used only if the fabric interconnect is directly connected to a router, or if either of the following are used upstream:

- Layer 3 aggregation
- VLAN in a box

**Note**

For both Ethernet switching modes, even when vNICs are hard pinned to uplink ports, all server-to-server unicast traffic in the server array is sent only through the fabric interconnect and is never sent through uplink ports. Server-to-server multicast and broadcast traffic is sent through all uplink ports in the same VLAN.

Configuring the Ethernet Switching Mode

**Important**

When you change the Ethernet switching mode, Cisco UCS Manager logs you out and restarts the fabric interconnect. For a cluster configuration, Cisco UCS Manager restarts both fabric interconnects sequentially. The second fabric interconnect can take several minutes to complete the change in Ethernet switching mode and become system ready.

Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Fabric Interconnects** ► *Fabric_Interconnect_Name*.
- Step 3** In the **Work** pane, click the **General** tab.
- Step 4** In the **Actions** area of the **General** tab, click one of the following links:
 - **Set Switching Mode**
 - **Set End-Host Mode**

The link for the current Ethernet switching mode is dimmed.
- Step 5** In the dialog box, click **Yes**.
Cisco UCS Manager restarts the fabric interconnect, logs you out, and disconnects Cisco UCS Manager GUI.
- Step 6** Launch Cisco UCS Manager GUI and log back in to continue configuring your system.

Monitoring a Fabric Interconnect

Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
- Step 2** On the **Equipment** tab, expand **Equipment** ► **Fabric Interconnects**.
- Step 3** Click the node for the fabric interconnect that you want to monitor.
- Step 4** In the **Work** pane, click one of the following tabs to view the status of the fabric interconnect:

Option	Description
General tab	Provides an overview of the status of the fabric interconnect, including a summary of any faults, a summary of the fabric interconnect properties, and a physical display of the fabric interconnect and its components.
Physical Ports tab	Displays the status of all ports on the fabric interconnect. This tab includes the following subtabs: <ul style="list-style-type: none"> • Uplink Ports tab • Server Ports tab • Fibre Channel Ports tab • Unconfigured Ports tab
Fans tab	Displays the status of all fan modules in the fabric interconnect.
PSUs tab	Displays the status of all power supply units in the fabric interconnect.
Physical Display tab	Provides a graphical view of the fabric interconnect and all ports and other components. If a component has a fault, the fault icon is displays next to that component.
Faults tab	Provides details of faults generated by the fabric interconnect.
Events tab	Provides details of events generated by the fabric interconnect.
Statistics tab	Provides statistics about the fabric interconnect and its components. You can view these statistics in tabular or chart format.

Changing the Properties of a Fabric Interconnect

Procedure

- Step 1** In the **Navigation** pane, click the **Admin** tab.
- Step 2** On the **Admin** tab, click **All**.
- Step 3** In the **Work** pane, click the **General** tab.
- Step 4** In the **Actions** area, click **Change System Name/IP Address**.
- Step 5** In the **Properties for: UCS Manager** dialog box, change one or more of the following fields:

Name	Description
System Name field	The name assigned to this Cisco UCS system.
System IP Address field	The IP address assigned to the Cisco UCS Manager GUI.
HA Configuration field	How this system is configured for high availability. This can be: <ul style="list-style-type: none"> • cluster • stand-alone

- Step 6** Click **OK**.
- Step 7** Log out of Cisco UCS Manager GUI and log back in again to see your changes.

Changing Access to a Fabric Interconnect

In-band access cannot be changed from Cisco UCS Manager GUI.

Procedure

- Step 1** In the **Navigation** pane, click the **Admin** tab.
- Step 2** On the **Admin** tab, click **All**.
- Step 3** In the **Work** pane, click the **General** tab.
- Step 4** In the **Actions** area, click **Change Fabric_Interconnect_Name Access**.
- Step 5** In the **Properties for: Fabric_Interconnect_Name** dialog box, click the **Communication Services** tab.
- Step 6** Change one or more of the following fields:

Name	Description
IP Address field	The IP address to use when communicating with the fabric interconnect.
Subnet Mask field	The associated subnet mask.

Name	Description
Default Gateway field	The associated gateway.

Step 7 Click OK.

Determining the Leadership Role of a Fabric Interconnect

Procedure

- Step 1** In the **Navigation** pane, click the **Equipment** tab.
 - Step 2** In the **Equipment** tab, expand **Equipment** ► **Fabric Interconnects**.
 - Step 3** Click the fabric interconnect for which you want to identify the role.
 - Step 4** In the **Work** pane, click the **General** tab.
 - Step 5** In the **General** tab, click the down arrows on the **High Availability Details** bar to expand that area.
 - Step 6** View the **Leadership** field to determine whether the fabric interconnect is the primary or subordinate.
-