



## LAN Ports and Port Channels

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## Port Modes

The port mode determines whether a unified port on the fabric interconnect is configured to carry Ethernet or Fibre Channel traffic. You configure the port mode in Cisco UCS Manager. However, the fabric interconnect does not automatically discover the port mode.

Changing the port mode deletes the existing port configuration and replaces it with a new logical port. Any objects associated with that port configuration, such as VLANs and VSANS, are also removed. There is no restriction on the number of times you can change the port mode for a unified port.

## Port Types

The port type defines the type of traffic carried over a unified port connection.

By default, unified ports changed to Ethernet port mode are set to the Ethernet uplink port type. Unified ports changed to Fibre Channel port mode are set to the Fibre Channel uplink port type. You cannot unconfigure Fibre Channel ports.

Changing the port type does not require a reboot.

### Ethernet Port Mode

When you set the port mode to Ethernet, you can configure the following port types:

- Server ports
- Ethernet uplink ports
- Ethernet port channel members
- FCoE ports
- Appliance ports
- Appliance port channel members
- SPAN destination ports
- SPAN source ports



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**Note** For SPAN source ports, configure one of the port types and then configure the port as SPAN source.

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### Fibre Channel Port Mode

When you set the port mode to Fibre Channel, you can configure the following port types:

- Fibre Channel uplink ports
- Fibre Channel port channel members
- Fibre Channel storage ports
- SPAN source ports



**Note** For SPAN source ports, configure one of the port types and then configure the port as SPAN source.

## Default Open Ports

The following table lists the default open ports used in Cisco UCS Manager.

Port	Interface	Protocol	Traffic Type	Fabric Interconnect	Usage
22	CLI	SSH	TCP	UCS 6200 Series UCS 6300 Series UCS 6400 Series UCS 6500 Series	Cisco UCS Manager CLI access
80	XML	HTTP	TCP	UCS 6200 Series UCS 6300 Series UCS 6400 Series UCS 6500 Series	Cisco UCS Manager GUI and third party management stations. Client download
443	XML	HTTP	TCP	UCS 6200 Series UCS 6300 Series UCS 6400 Series UCS 6500 Series	Cisco UCS Manager login page access Cisco UCS Manager XML API access

Port	Interface	Protocol	Traffic Type	Fabric Interconnect	Usage
743	KVM	HTTP	TCP	UCS 6200 Series UCS 6300 Series UCS 6400 Series	CIMC Web Service / Direct KVM
7546	CFS	CFSD	TCP	UCS 6400 Series UCS 6500 Series	Cisco Fabric Service

## TCP and UDP Ports

The tables below list the incoming and outgoing TCP and UDP ports used in Cisco UCS for management access.

**Table 1: Incoming ports**

Port	Interface	Protocol	Traffic type	Usage
23	CLI	Telnet	TCP	Cisco UCS Manager CLI access
22	CLI	SSH	TCP	Cisco UCS Manager CLI access
443	Static HTML	HTTPS	TCP	Cisco UCS Manager login page access
80	Static HTML	HTTP	TCP	Client download
443	XML	HTTPS	TCP	Cisco UCS Manager XML API access
80	XML	HTTP	TCP	Ports used by Cisco UCS Manager GUI and third party management stations.
23	Serial-over-LAN	Telnet	TCP	COM1 port access on a specified server
22	Serial-over-LAN	SSH	TCP	COM1 port access on a specified server
161	SNMP	SNMP	UDP	SNMP MIBs exposed for monitoring
623	IPMI-over-LAN	RMCP	UDP	IPMI access to BMCs
2068	KVM	HTTPS	TCP	Data path for the BMCs

Port	Interface	Protocol	Traffic type	Usage
5988	CIMC XML	HTTP	TCP	Send CIMC messages over HTTP
743	KVM	HTTP	TCP	CIMC Web Service / Direct KVM
5661		HTTPD	TCP	Internal communication This port is applicable only to UCS 6400 Series Fabric Interconnects. It is disabled in Cisco UCS Manager Release 4.0(4f) and later releases.
7162		HTTPD	TCP	Internal communication This port is applicable only to UCS 6400 Series Fabric Interconnects. It is disabled in Cisco UCS Manager Release 4.0(4g) and later releases.
7546	CFS	CFSD	TCP	Cisco Fabric Service This port is applicable only to UCS 6400 Series Fabric Interconnects.

Table 2: Outgoing ports

Port	Service	Protocol	Traffic type	Usage
1812	AAA	RADIUS	UDP	AAA server authentication requests
1813	AAA	RADIUS	UDP	AAA server authentication requests
49	AAA	TACACS	TCP	AAA server authentication requests
389	AAA	LDAP	UDP	
123	Time Sync	NTP	UDP	Synchronize the time with global time servers
162	SNMP Traps	SNMP	UDP	Send traps to a remote network management system.

Port	Service	Protocol	Traffic type	Usage
25	Call Home	SMTP	TCP	Email-based and web-based notifications for critical system events
514	Syslog	SYSLOG	UDP	Cisco UCS Manager generated Syslog messages
53	Name resolution	DNS	UDP	DNS queries
69	TFTP	TFTP	UDP	File transfers
115	SFTP	SFTP	TCP	File transfers
20-21	FTP	FTP	TCP	File transfers
21	SCP	SCP	TCP	File transfers

## Breakout Ethernet Ports

### Port Breakout Functionality on Cisco UCS 6536 Fabric Interconnects

The Cisco UCS 6536 36-Port Fabric Interconnect is a One-Rack-Unit (1RU) 1/10/25/40/100 Gigabit Ethernet, FCoE, and Fibre Channel switch offering up to 7.42 Tbps throughput and up to 36 ports.

Cisco UCS 6536 Fabric Interconnect supports splitting a single 40 Gigabit(G)/100G Quad Small Form-factor Pluggable (QSFP) port into four 10G/25G ports using a supported breakout cable. The switch has 32 40/100-Gbps Ethernet ports and four unified ports that can support 40/100-Gbps Ethernet ports or 16 Fiber Channel (FC) ports after breakout at 8/16/32-Gbps FC speeds. The 16 FC ports after breakout can operate as an FC Uplink or FC storage port. The switch also supports two ports (Port 9 and Port 10) at 1-Gbps speed using QSA, and all 36 ports can breakout for 10 or 25 Gbps Ethernet connectivity. All Ethernet ports can support FCoE.

Port breakout is supported for Ethernet ports (1-32) and Unified ports (33-36). These 40/100G ports are numbered in a 2-tuple naming convention. The process of changing the configuration from 40G to 10G, or from 100G to 25G is called breakout, and the process of changing the configuration from [4X]10G to 40G or from [4X]25G to 100G is called unconfigure.

When you break out a 40G port into 10G ports or a 100G port into 25G ports, the resulting ports are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/31/1, 1/31/2, 1/31/3, and 1/31/4.

FC breakout is supported on ports 36 through 33 when each port is configured with a four-port breakout cable. For example: Four FC breakout ports on the physical port 33 are numbered as 1/33/1, 1/33/2, 1/33/3, and 1/33/4.



**Note** Fibre Channel support is only available through the configuration of the Unified Ports (36-33) as Fibre Channel breakout port.

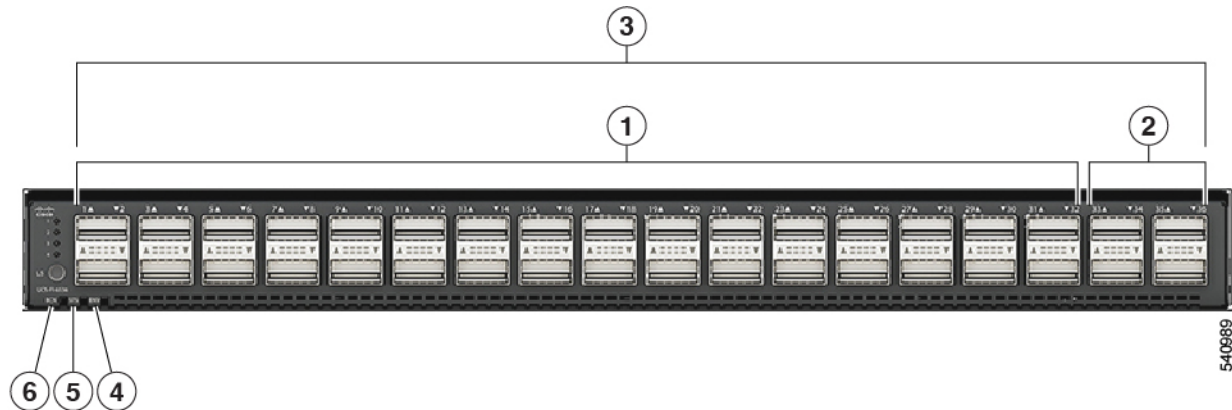
The following image shows the rear view of the Cisco UCS 6536 fabric interconnect:

**Figure 1: Cisco UCS 6536 Fabric Interconnect Rear View**



The following image shows the rear view of the Cisco UCS 6536 fabric interconnect that include Ports and LEDs:

**Figure 2: Cisco UCS 6536 Fabric Interconnect Rear View**



<p>1</p>	<p>Ports 1-32.</p> <p>Uplink ports are Ethernet port that can operate with the port speed of 10 Gbps/25 Gbps/40 Gbps/100 Gbps.</p> <p>When using a breakout cable, each of these ports can operate as: 4 x 10 Gbps/4x 25 Gbps/1 x 40 Gbps/1 x 100 Gbps Ethernet or FCoE ports.</p>	<p>2</p>	<p>Ports 33-36.</p> <p>Unified Ports can operate with port speed of 10 Gbps/25 Gbps/ 40 Gbps/100 Gbps Ethernet.</p> <p>or</p> <p>8 Gbps/16 Gbps/32 Gbps Fibre Channel (FC).</p> <p>When using a breakout cable, each of these ports can operate as 4 x 10 Gbps/4 x 25 Gbps Ethernet or 4x8Gbps/4x16Gbps/4x32Gbps FC ports.</p>
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3	Ports 1-36.  Uplink ports and Unified ports that can be configured as Ethernet Breakout Port and can operate with the port speed of 10 Gbps/25 Gbps/40 Gbps/100 Gbps.  When using a breakout cable, each of these ports can operate as: 4 x 10 Gbps/4x 25 Gbps/1 x 40 Gbps/1 x 100 Gbps Ethernet or FCoE ports.	4	System environment (fan fault) LED
5	System status (STS) LED	6	Beacon (BCN) LED

### Breakout Port Guidelines

The following are the guidelines for breakout functionality for Cisco UCS 6536 Fabric Interconnects:

- The configurable breakout ports are from port 1-36.
- You can configure the speed for each breakout port. Each breakout port can be configured at the speed of 4 x 8 Gbps/ 4 x 16 Gbps/ 4 x 32 Gbps for Fibre Channel.
  - For Fibre Channel breakout, each breakout port can be configured at the speed of 4 x 8 Gbps/ 4 x 16 Gbps/ 4 x 32 Gbps.
  - For Ethernet breakout, each breakout port can be configured at the speed of 4 x 10 Gbps/4 x 25 Gbps.
- Fibre Channel breakout ports are supported, and Fiber Channel direct ports are not supported.
- FC breakout port can be configured from 1/36 through 1/33. FC breakout ports (36-33) cannot be configured unless the previous ports are FC breakout ports. Configuration of a single (individual) FC breakout port is also supported.
- If the breakout mode for any of the supported Fabric Interconnect ports (1-36) is an Ethernet breakout, the Fabric Interconnect does not lead to a reboot.
- If the breakout mode for any of the supported Fabric Interconnect ports (36-33) is a Fibre Channel uplink breakout, the Fabric Interconnect leads to a reboot.
- Breakout ports are supported as destinations for traffic monitoring.
- Ports 1-36 can be configured as Server Port, FCoE Uplink Port, Appliance Port, and Monitor Port.
- Port 36-33 can be configured also as FC Uplink Port or FC Storage Port when configured as unified port.

## Configuring Ethernet Breakout Ports on UCS 6536 Fabric Interconnects

### Procedure

- Step 1** On the **Equipment** tab, expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.



The Fabric Interconnect **General** tab appears, providing at-a-glance status, actions, physical display, properties, and firmware information for the selected fabric interconnect.

**Step 2** View the available port(s) to break out.

Ensure that the port overall status is up and admin status is available. Do one of the following:

- In the **Work** pane, click the **Physical Ports** tab. The **Ethernet Ports** and **FC Ports** subtabs appear.
- In the **Work** pane, click the **Physical Display** tab. The Physical Display shows a graphical representation of the base fabric interconnect with a legend to help you identify port admin status.
- In the **Navigation** pane, expand *Fabric\_Interconnect\_Name* > **Fixed Module** > **Ethernet Ports**. this action displays ports in a tree view.

**Step 3** Select one or more ports that you can break out. On the UCS 6536 fabric interconnect, ports 1 to 36 support breakout. Do one of the following:

- On the **Physical Display**, click a port or Ctrl-click to select multiple ports.
- On the **Ethernet Ports** tab, click a port or Ctrl-click to select multiple ports.
- On the **Ethernet Ports** tree view, click a port or Ctrl-click to select multiple ports.

**Step 4** Configure the selected port(s) as breakout ports.

- On the **Ethernet Ports** tab, right-click the selected port(s) and choose **Configure 4x10G Breakout Port** or **Configure 4x25G Breakout Port** from the pop-up menu.
- On the **Ethernet Ports** tree view, right-click the selected port(s) and choose **Configure 4x10G Breakout Port** or **Configure 4x25G Breakout Port** from the pop-up menu. You can also select ports in the **Ethernet Ports** tree view and select **Configure Breakout Port** from the **Work** pane **Actions** Area. From the drop-down list, choose whether you want to configure the breakout port as a **4x10G port** or a **4x25G port**.

**Step 5** Click **OK**.

**Step 6** Configure the breakout ports according to your requirements.

Right-click one or more ports and select one of the following options. This table describes the actions that occur when you select the option. If a option is disabled, the port is already configured as such.

Configure Option	Action
<b>Configure as Server Port</b>	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
<b>Configure as Uplink Port</b>	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
<b>Configure as FCoE Uplink Port</b>	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
<b>Configure as FCoE Storage Port</b>	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
<b>Configure as Appliance Port</b>	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .

**Step 7** The confirmation dialog box displays. Click **Yes**.

**Note** Ethernet breakout port configuration will not lead to Fabric Interconnect reboot.

## Configuring a 10/25G Port with QSA on Cisco UCS FI 6536

When a port on UCS FI 6536 is operating at the default 40/100G port speed, Cisco UCS Manager does not let you choose port speeds of 1G, 10G, or 25G. To use a 40/100G port on UCS FI 6536 as a 10/25 G port with a QSFP+Adapter (QSA) transceiver on the other end, you must configure it in the breakout mode.



**Note** When you try to change port speeds to 10G or 25G, Cisco UCS Manager displays a prompt to configure the port in breakout mode. After you configure a breakout port, you can configure each 10/25G GB sub-port as an uplink, or FCoE uplink port as required.

When you break out the port, use a breakout cable to split a single port into four 10G or 25G ports, and configure the ports in breakout mode, you can use all lanes as 10 G or 25G ports. If you break out the port without a breakout cable, only the first lane becomes usable as a 10G or 25G interface.

### Procedure

- Step 1** Configure breakout feature on the port that you want to use as a 10/25G port on the Cisco UCS FI 64108. For more information about configuring the break out feature, see *Configuring Fabric Interconnect Ethernet Breakout Ports*.
- Step 2** In Cisco UCS Manager, the first tuple interface is enabled after the QSA transceiver is plugged into the FI port. You can configure this interface based on your requirements.
- The resulting ports after a break out of the 40/100G port are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/36/1, 1/36/2, 1/36/3, 1/36/4, and only the first port becomes usable as a 10 GB port.

## Port Breakout Functionality on Cisco UCS 64108 Fabric Interconnects

### About Breakout Ports

Cisco UCS 64108 fabric interconnects support splitting a single 40/100G QSFP port into four 10/25G ports using a supported breakout cable. On the UCS 64108 fabric interconnect, by default, there are 12 ports in the 40/100G mode. These are ports 97 to 108. These 40/100G ports are numbered in a 2-tuple naming convention. For example, the second 40G port is numbered as 1/99. The process of changing the configuration from 40G to 10 G, or from 100G to 25G is called breakout, and the process of changing the configuration from [4X]10G to 40G or from [4X]25G to 100G is called unconfigure. These ports can be used as uplink port, appliance port, server port (using FEX), and FCoE storage port.

When you break out a 40G port into 10G ports or a 100G port into 25G ports, the resulting ports are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/99/1, 1/99/2, 1/99/3, 1/99/4.

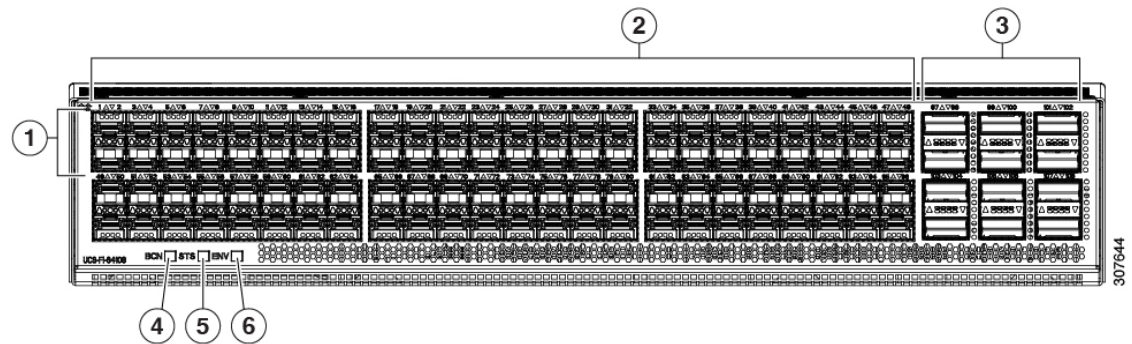


**Note** Cisco UCS Manager does not support connection of FEX, chassis, blade, IOM, or adapters (other than VIC adapters) to the uplink ports of Fabric Interconnect.

Starting with Cisco UCS Manager Release 4.2(3b), configuring the Ethernet breakout ports will not lead to Fabric Interconnect reboot.

The following image shows the rear view of the Cisco UCS 64108 fabric interconnect, and includes the ports that support breakout port functionality:

**Figure 3: Cisco UCS 64108 Fabric Interconnect Rear View**



1	Ports 1-16. Unified Ports can operate as 10/25 Gbps Ethernet or 8/16/32 Gbps Fibre Channel. FC ports are converted in groups of four.  Unified ports: <ul style="list-style-type: none"> <li>• 10/25 Gbps Ethernet or FCoE</li> <li>• 8/16/32 Gbps Fibre Channel</li> </ul>	2	Ports 1-96. Each port can operate as either a 10 Gbps or 25 Gbps Ethernet or FCoE SFP28 port.
3	Uplink Ports 97-108. Each port can operate as either a 40 Gbps or 100 Gbps Ethernet or FCoE port. When using a breakout cable, each of these ports can operate as 4 x 10 Gbps or 4 x 25 Gbps Ethernet or FCoE ports.  Ports 97 - 108 can be used to connect to Ethernet or FCoE uplink ports, and not to UCS server ports.	4	Ports 89-96 <ul style="list-style-type: none"> <li>• 10/25 Gbps Ethernet or FCoE</li> <li>• 1 Gbps Ethernet</li> </ul>
5	System environment (fan fault) LED	6	System status LED
7	Beacon LED		

**Breakout Port Guidelines**

The following are the guidelines for breakout functionality for Cisco UCS 64108 fabric interconnects:

- The breakout configurable ports are ports 97-108.
- You cannot configure the speed for each breakout port. Each breakout port is in auto mode.
- Breakout ports are not supported as destinations for traffic monitoring.
- Ports 97-108 can be configured as uplink, appliance, server(using FEX), and FCoE storage ports.

## Configuring Ethernet Breakout Ports on UCS 64108 Fabric Interconnects

Beginning with Cisco UCS Manager Release 4.2(3h), Ethernet breakout port configuration will not lead to Fabric Interconnect reboot.

After you configure a breakout port, you can configure each 10/25G GB sub-port as an uplink, or FCoE uplink port as required.

### Procedure

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- Step 1** On the **Equipment** tab, expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.  
The Fabric Interconnect **General** tab appears, providing at-a-glance status, actions, physical display, properties, and firmware information for the selected fabric interconnect.
- Step 2** View the available port(s) to break out.  
Ensure that the port overall status is up and admin status is available. Do one of the following:
- In the **Work** pane, click the **Physical Ports** tab. The **Ethernet Ports** and **FC Ports** subtabs appear.
  - In the **Work** pane, click the **Physical Display** tab. The Physical Display shows a graphical representation of the base fabric interconnect with a legend to help you identify port admin status.
  - In the **Navigation** pane, expand *Fabric\_Interconnect\_Name* > **Fixed Module** > **Ethernet Ports**. this action displays ports in a tree view.
- Step 3** Select one or more ports that you can break out. On the UCS 64108 fabric interconnect, ports 97 to 108 support breakout. Do one of the following:
- On the **Physical Display**, click a port or Ctrl-click to select multiple ports.
  - On the **Ethernet Ports** tab, click a port or Ctrl-click to select multiple ports.
  - On the **Ethernet Ports** tree view, click a port or Ctrl-click to select multiple ports.
- Step 4** Configure the selected ports as breakout ports.
- On the **Ethernet Ports** tab, right-click the selected port(s) and choose **Configure 4x10G Breakout Port** or **Configure 4x25G Breakout Port** from the pop-up menu. This command is disabled if the port does not support breakout.
  - On the **Ethernet Ports** tree view, right-click the selected port(s) and choose **Configure 4x10G Breakout Port** or **Configure 4x25G Breakout Port** from the pop-up menu. This command is disabled if the port does not support breakout. You can also select ports in the **Ethernet Ports** tree view and select **Configure Breakout Port** from the **Work** pane **Actions** Area. From the drop-down list, choose whether you want to configure the breakout port as a **4x10G port** or a **4x25G port**.
- Step 5** Click **OK**.
- Step 6** Configure the breakout ports according to your requirements.

Right-click one or more ports and select one of the following commands. This table describes the actions that occur when you select the command. If a command is disabled, the port is already configured as such.

Configure Command	Action
Configure as Server Port	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
Configure as Uplink Port	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
Configure as FCoE Uplink Port	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
Configure as FCoE Storage Port	Not supported on UCS 64108.
Configure as Appliance Port	Not supported on UCS 64108.

**Step 7** The confirmation dialog box displays. Click **Yes**.

## Configuring a 10/25G Port with QSA on Cisco UCS FI 64108

When a port on UCS FI 64108 is operating at the default 40/100G port speed, Cisco UCS Manager does not let you choose port speeds of 1G, 10G, or 25G. To use a 40/100G port on UCS FI 6454 as a 10/25 G port with a QSFP+Adapter (QSA) transceiver on the other end, you must configure it in the breakout mode.



**Note** When you try to change port speeds to 10G or 25G, Cisco UCS Manager displays a prompt to configure the port in breakout mode. After you configure a breakout port, you can configure each 10/25G GB sub-port as an uplink, or FCoE uplink port as required.

When you break out the port, use a breakout cable to split a single port into four 10G or 25G ports, and configure the ports in breakout mode, you can use all lanes as 10 G or 25G ports. If you break out the port without a breakout cable, only the first lane becomes usable as a 10G or 25G interface.

### Procedure

**Step 1** Configure breakout feature on the port that you want to use as a 10/25G port on the Cisco UCS FI 64108. For more information about configuring the break out feature, see *Configuring Fabric Interconnect Ethernet Breakout Ports*.

**Step 2** In Cisco UCS Manager, the first tuple interface is enabled after the QSA transceiver is plugged into the FI port. You can configure this interface based on your requirements.

The resulting ports after a break out of the 40/100G port are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/50/1, 1/50/2, 1/50/3, 1/50/4, and only the first port becomes usable as a 10 GB port.

# Port Breakout Functionality on Cisco UCS 6454 Fabric Interconnects

## About Breakout Ports

Cisco UCS 6454 fabric interconnects support splitting a single 40/100G QSFP port into four 10/25G ports using a supported breakout cable. These ports can be used only as uplink ports connecting to a 10/25G switch. On the UCS 6454 fabric interconnect, by default, there are 6 ports in the 40/100G mode. These are ports 49 to 54. These 40/100G ports are numbered in a 2-tuple naming convention. For example, the second 40G port is numbered as 1/50. The process of changing the configuration from 40G to 10 G, or from 100G to 25G is called breakout, and the process of changing the configuration from [4X]10G to 40G or from [4X]25G to 100G is called unconfigure.

When you break out a 40G port into 10G ports or a 100G port into 25G ports, the resulting ports are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/50/1, 1/50/2, 1/50/3, 1/50/4.

Starting with Cisco UCS Manager Release 4.2(3b), Ethernet breakout ports configuration will not lead to Fabric Interconnect reboot.

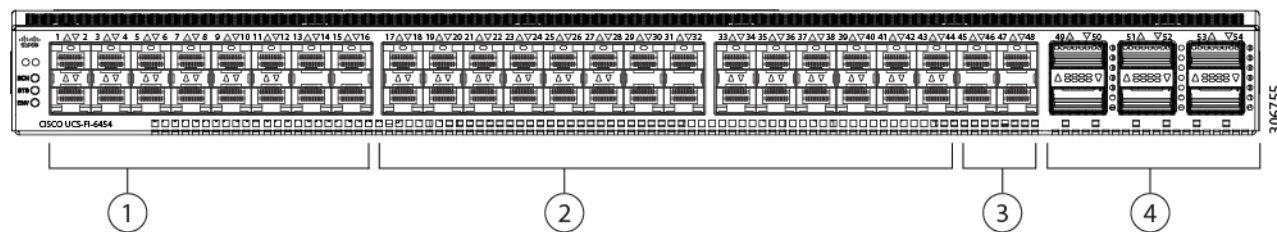
Starting with Cisco UCS Manager Release 4.1(3a), you can connect Cisco UCS Rack servers with VIC 1455 and 1457 adapters, to the uplink ports 49 to 54 (40/100 Gbps Ethernet or FCoE) in Cisco UCS 6454 Fabric Interconnects.



**Note** Cisco UCS Manager does not support connection of FEX, chassis, blade, IOM, or adapters (other than VIC 1455 and 1457 adapters) to the uplink ports of Fabric Interconnect.

The following image shows the rear view of the Cisco UCS 6454 fabric interconnect, and includes the ports that support breakout port functionality:

**Figure 4: Cisco UCS 6454 Fabric Interconnect Rear View**



1	Ports 1-16 (Unified Ports 10/25 Gbps Ethernet or FCoE or 8/16/32 Gbps Fibre Channel)	2	Ports 17-44 (10/25 Gbps Ethernet or FCoE)
3	Ports 45-48 (1/10/25 Gbps Ethernet or FCoE)	4	Uplink Ports 49-54 (40/100 Gbps Ethernet or FCoE)

## Breakout Port Guidelines

The following are the guidelines for breakout functionality for Cisco UCS 6454 fabric interconnects:

- The breakout configurable ports are ports 49-54.

- You cannot configure the speed for each breakout port. Each breakout port is in auto mode.
- In Cisco UCS Manager Release 4.0(2), breakout ports are not supported as destinations for traffic monitoring.
- Ports 49-54 can only be configured as uplink ports. They cannot be configured as any of the following:
  - Server ports
  - FCoE storage ports
  - Appliance ports

## Configuring Ethernet Breakout Ports on UCS 6454 Fabric Interconnects



**Caution** Beginning with Cisco UCS Manager Release 4.2(3h), Ethernet breakout ports configuration will not lead to Fabric Interconnect reboot.

### Procedure

- Step 1** On the **Equipment** tab, expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.  
The Fabric Interconnect **General** tab appears, providing at-a-glance status, actions, physical display, properties, and firmware information for the selected fabric interconnect.
- Step 2** View the available port(s) to break out.  
Ensure that the port overall status is up and admin status is available. Do one of the following:
- In the **Work** pane, click the **Physical Ports** tab. The **Ethernet Ports** and **FC Ports** subtabs appear.
  - In the **Work** pane, click the **Physical Display** tab. The Physical Display shows a graphical representation of the base fabric interconnect with a legend to help you identify port admin status.
  - In the **Navigation** pane, expand *Fabric\_Interconnect\_Name* > **Fixed Module** > **Ethernet Ports**. this action displays ports in a tree view.
- Step 3** Select one or more ports that you can break out. On the UCS 6454 fabric interconnect, ports 49 to 54 support breakout. Do one of the following:
- On the **Physical Display**, click a port or Ctrl-click to select multiple ports.
  - On the **Ethernet Ports** tab, click a port or Ctrl-click to select multiple ports.
  - On the **Ethernet Ports** tree view, click a port or Ctrl-click to select multiple ports.
- Step 4** Configure the selected port(s) as breakout ports.
- On the **Ethernet Ports** tab, right-click the selected port(s) and choose **Configure 4x10G Breakout Port** or **Configure 4x25G Breakout Port** from the pop-up menu. This command is disabled if the port does not support breakout.
  - On the **Ethernet Ports** tree view, right-click the selected port(s) and choose **Configure 4x10G Breakout Port** or **Configure 4x25G Breakout Port** from the pop-up menu. This command is disabled if the port does not support breakout. You can also select ports in the **Ethernet Ports** tree view and select **Configure**

**Breakout Port** from the **Work** pane **Actions** Area. From the drop-down list, choose whether you want to configure the breakout port as a **4x10G port** or a **4x25G port**.

**Step 5** Click **OK**.

**Step 6** Configure the breakout ports according to your requirements.

Right-click one or more ports and select one of the following commands. This table describes the actions that occur when you select the command. If a command is disabled, the port is already configured as such.

Configure Command	Action
Configure as Server Port	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
Configure as Uplink Port	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
Configure as FCoE Uplink Port	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
Configure as FCoE Storage Port	Not supported on Cisco UCS 6454.
Configure as Appliance Port	Not supported on Cisco UCS 6454.

**Step 7** The confirmation dialog box displays. Click **Yes**.

## Configuring a 10/25G Port with QSA Adapter on Cisco UCS FI 6454

When a port on UCS FI 6454 is operating at the default 40/100G port speed, Cisco UCS Manager does not let you choose port speeds of 1G, 10G, or 25G. To use a 40/100G port on UCS FI 6454 as a 10/25 G port with a QSFP+Adapter (QSA) transceiver on the other end, you must configure it in the breakout mode.



**Note** When you try to change port speeds to 10G or 25G, Cisco UCS Manager displays a prompt to configure the port in breakout mode. After you configure a breakout port, you can configure each 10/25G GB sub-port as an uplink, or FCoE uplink port as required.

When you break out the port, use a breakout cable to split a single port into four 10G or 25G ports, and configure the ports in breakout mode, you can use all lanes as 10 G or 25G ports. If you break out the port without a breakout cable, only the first lane becomes usable as a 10G or 25G interface.

### Procedure

**Step 1** Configure breakout feature on the port that you want to use as a 10/25G port on the Cisco UCS FI 6454. For more information about configuring the break out feature, see *Configuring Fabric Interconnect Ethernet Breakout Ports*.

**Step 2** In Cisco UCS Manager, the first tuple interface is enabled after the QSA transceiver is plugged into the FI port. You can configure this interface based on your requirements.



The resulting ports after a break out of the 40/100G port are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/50/1, 1/50/2, 1/50/3, 1/50/4, and only the first port becomes usable as a 10 GB port.

## Port Breakout Functionality on Cisco UCS 6300 Series Fabric Interconnects

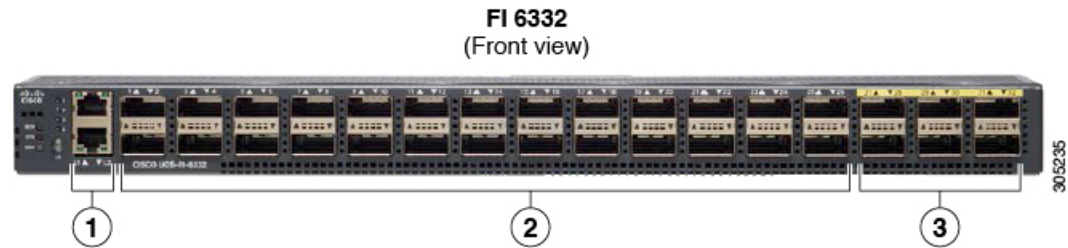
### About Breakout Ports

Cisco UCS fabric interconnect 6300 series supports splitting a single QSFP port into four 10G ports using a supported breakout cable. By default, there are 32 ports in the 40G mode. These 40G ports are numbered in a 2-tuple naming convention. For example, the second 40G port is numbered as 1/2. The process of changing the configuration from 40G to 10G is called breakout and the process of changing the configuration from [4X]10G to 40G is called unconfigure.

When you break out a 40G port into 10G ports, the resulting ports are numbered using a 3-tuple naming convention. For example, the breakout ports of the second 40-Gigabit Ethernet port are numbered as 1/2/1, 1/2/2, 1/2/3, 1/2/4.

The following image shows the front view for the Cisco UCS 6332 series fabric interconnects, and includes the ports that may support breakout port functionality:

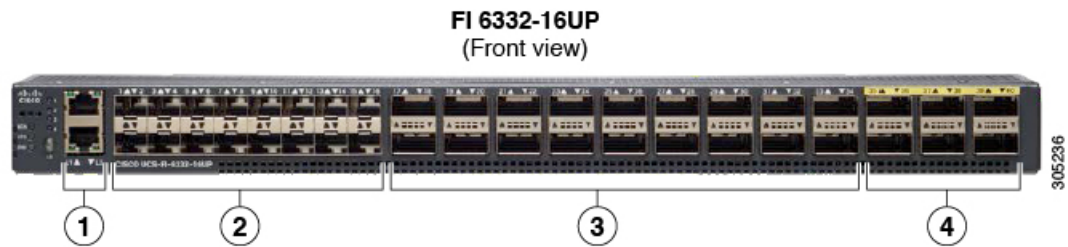
**Figure 5: Cisco UCS 6332 Series Fabric Interconnects Front View**



1	L1 and L2 high availability ports
2	28 X 40G QSFP ports ( 98 X 10G SFP ports) <b>Note</b> <ul style="list-style-type: none"> <li>• QSA module is required on ports 13–14</li> <li>• A QSFP to 4XSFP breakout cable is required for 10G support.</li> </ul>
3	6 X 40G QSFP ports

The following image shows the front view for the Cisco UCS 6332-16UP series fabric interconnects, and includes the ports that may support breakout port functionality:

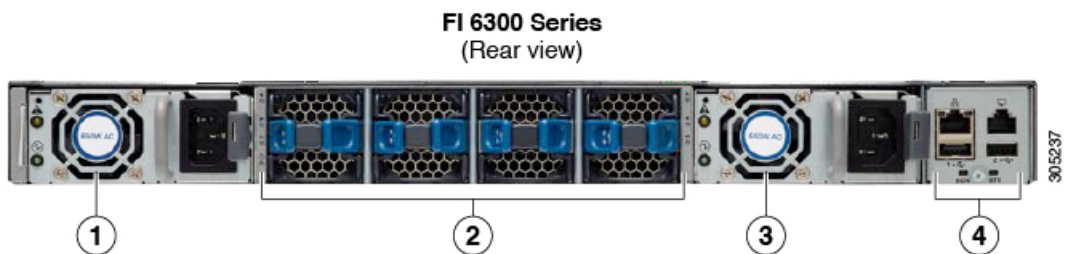
Figure 6: Cisco UCS 6332-16UP Series Fabric Interconnects Front View



1	L1 and L2 high availability ports
2	16 X 1/10G SFP (16 X 4/8/16G FC ports)
3	18 X 40G QSFP(72 X 10G SFP+) <b>Note</b> • A QSFP to 4XSFP breakout cable is required for 10G support.
4	6 X 40G QSFP ports

The following image shows the rear view of the Cisco UCS 6300 series fabric interconnects.

Figure 7: Cisco UCS 6300 Series Fabric Interconnects Rear View



1	Power supply
2	Four fans
3	Power supply
4	Serial ports

### Breakout Port Constraints

The following table summarizes the constraints for breakout functionality for Cisco UCS 6300 series fabric interconnects:

Cisco UCS 6300 Series Fabric Interconnect Series	Breakout Configurable Ports	Ports without breakout functionality support
Cisco UCS 6332	1–12, 15–26	13–14, 27–32 <b>Note</b> • Auto-negotiate behavior is not supported on ports 27–32.
Cisco UCS 6332-16UP	17–34	1–16, 35–40 <b>Note</b> • Auto-negotiate behavior is not supported on ports 35–40




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**Important** Up to four breakout ports are allowed if QoS jumbo frames are used.

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## Configuring Ethernet Breakout Ports on UCS 6300 Fabric Interconnects

You can configure Cisco UCS 6300 Fabric Interconnects with 40 GB Ethernet ports as four breakout 10 GB ports, using a supported breakout cable. The configuration requires a Small Form-Factor Pluggable adapter (SFP) that has one 40GB QSFP+ on one end to connect to the Fabric Interconnect and four 10 GB ports to connect to different end points supporting 10 GB connectivity. .




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**Caution** Configuring breakout ports requires rebooting the Fabric Interconnect. Any existing configuration on a port is erased. We recommend that you break out all required ports in a single transaction.

---

Once you configure a breakout port, you can configure each 10 GB sub-port as server, uplink, FCoE uplink, FCoE storage, or appliance as required.

The following table summarizes the constraints for breakout functionality for Cisco UCS 6300 series fabric interconnects:

Fabric Interconnect	Breakout Configurable Ports	Normal Ports with no Breakout Support
UCS-FI-6332	1-12,15-26	13-14,27-32  <b>Note</b> <ul style="list-style-type: none"> <li>• Auto-negotiate behavior is not supported on ports 27–32.</li> <li>• A maximum of four ports are allowed as breakout ports if using QoS jumbo frames.</li> </ul>
UCS-FI-6332-16UP	17-34	1-16,35-40  <b>Note</b> <ul style="list-style-type: none"> <li>• Auto-negotiate behavior is not supported on ports 35-40.</li> <li>• A maximum of four ports are allowed as breakout ports if using QoS jumbo frames.</li> </ul>

### Procedure

- Step 1** On the **Equipment** tab, expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.  
The Fabric Interconnect **General** tab appears, providing at-a-glance status, actions, physical display, properties, and firmware information for the selected fabric interconnect.
- Step 2** View the available port(s) to break out.  
Ensure that the port overall status is up and admin status is available. Do one of the following:
- In the **Work** pane, click the **Physical Ports** tab. The **Ethernet Ports** and **FC Ports** subtabs appear.
  - In the **Work** pane, click the **Physical Display** tab. The Physical Display shows a graphical representation of the base fabric interconnect with a legend to help you identify port admin status.
  - In the **Navigation** pane, expand *Fabric\_Interconnect\_Name* > **Fixed Module** > **Ethernet Ports**. this action displays ports in a tree view.
- Step 3** Select one or more ports that you can break out. Do one of the following:
- On the **Physical Display**, click a port or Ctrl-click to select multiple ports.
  - On the **Ethernet Ports** tab, click a port or Ctrl-click to select multiple ports.

- On the **Ethernet Ports** tree view, click a port or Ctrl-click to select multiple ports.

**Step 4** Configure the selected port(s) as a breakout ports.  
Right-click the selected port(s) and choose **Configure Breakout Port** from the pop-up menu. This command is disabled if the port does not support breakout. You can also select ports in the **Ethernet Ports** tree view and select **Configure Breakout Port** from the **Work** pane **Actions** Area.

**Caution** Configuring breakout ports requires rebooting the fabric interconnect. Any existing configuration on a port is erased. We recommend that you break out all required ports in a single transaction.

**Step 5** Click **OK**.

The reboot process takes several minutes.

**Step 6** When the fabric interconnect reboots, log in to Cisco UCS Manager and configure the breakout ports according to your requirements.

Right-click one or more ports and select one of the following commands. This table describes the actions that occur when you select the command. If a command is disabled, the port is already configured as such.

Configure Command	Action
<b>Configure as Server Port</b>	You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
<b>Configure as Uplink Port</b>	
<b>Configure as FCoE Uplink Port</b>	
<b>Configure as FCoE Storage Port</b>	The system notifies you that FC Switching mode must be set to End Host Mode. Configuring a storage port in the current mode is unsuccessful. You confirm your action. Configuration takes place. The system displays a successful message. Click <b>Yes</b> .
<b>Configure as Appliance Port</b>	Displays the <b>Configure as Appliance Port Dialog Box</b> from which you can configure settings, including the Ethernet Target Endpoint.

**Step 7** The confirmation dialog box displays. Click **Yes**.

The fabric interconnect reboots and all traffic stops.

## Configuring a 10G Port with QSA Adapter on Cisco UCS FI 6332 and 6332-16UP

When a port on UCS FI 6332 or 6332-16UP is operating at the default 40G port speed, Cisco UCS Manager does not let you choose port speeds of 1GB or 10GB. To use a 40G port on UCS FI 6332 or 6332-16UP as a 10 GB port with a QSFP+Adapter (QSA) transceiver on the other end, you must configure it in the breakout mode.



**Note** When you try to change port speeds to 1GB or 10GB, Cisco UCS Manager displays a prompt to configure the port in breakout mode. Once you configure a breakout port, you can configure each 10GB sub-port as server, uplink, FCoE uplink, FCoE storage or appliance as required.

When you break out the port, only the first lane becomes usable as a 10G interface. If you use a breakout cable to split a single port into four 10G ports, and configure the ports in breakout mode, you can use all lanes as 10 GB ports.

### Procedure

**Step 1** Configure breakout feature on the port that you want to use as a 10GB port on the Cisco UCS FI 6332 or 6332-16UP. For more information about configuring the break out feature, see *Configuring Fabric Interconnect Ethernet Breakout Ports*.

**Caution** Configuring breakout ports requires rebooting the Fabric Interconnect. Any existing configuration on a port is erased. It is recommended to break out all required ports in a single transaction.

**Step 2** In Cisco UCS Manager, the first tuple interface is enabled after the QSA transceiver is plugged into the FI port. You can configure this interface based on your requirements.

The resulting ports after a break out of the 40G port are numbered using a 3-tuple naming convention. For example, the supported breakout ports are numbered Br-Ethernet 1/25/1, Br-Ethernet 1/25/2, Br-Ethernet 1/25/3, and Br-Ethernet 1/25/4, and only the first port becomes usable as a 10 GB port.

## Reconfiguring an Ethernet Breakout Port

You can reconfigure an unconfigured breakout port in a particular role, such as Server, Uplink, or Appliance. Reconfiguring a Cisco UCS 6300, 6400, or 6500 Series Fabric Interconnect breakout port allows you to modify the existing port configuration to your current requirements.

An unconfigured Cisco UCS 6400 Series Fabric Interconnect breakout port can be reconfigured only as an Uplink or FCoE Uplink port.

### Procedure

**Step 1** On the **Equipment** tab, expand **Equipment > Fabric Interconnects > Fabric\_Interconnect\_Name > Fixed Module**.

**Step 2** Select one or more ports that you have broken out. Do one of the following:

- On the **Physical Display**, click a port or Ctrl-click to select multiple ports.
- On the **Ethernet Ports** tab, click a port or Ctrl-click to select multiple ports.
- On the **Ethernet Ports** tree view, click a port or Ctrl-click to select multiple ports.

**Step 3** Reconfigure the port(s)  
On the **General Tab Actions** area, click **Reconfigure** from the pop-up menu.

**Step 4** The confirmation dialog box displays.  
Click **Yes**. The fabric interconnect reboots and all traffic stops.

**Step 5** The system displays a success message.  
Click **OK**.

**Note** Starting with Cisco UCS Manager Release 4.2(3b), configuring the Ethernet breakout ports will not lead to Fabric Interconnect reboot.

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## Unconfiguring a Breakout Port

If you want to configure a Cisco UCS 6300 Series Fabric Interconnect breakout port back to a 40 GB Ethernet port, a Cisco UCS 6400, or a Cisco UCS 6500 Series Fabric Interconnect breakout port back to a 40/100 GB Ethernet port, you must first unconfigure it.

### Procedure

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**Step 1** On the **Equipment** tab, expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name* > **Fixed Module**.

**Step 2** On the **General Tab**, right-click a port in the physical display area and select **Unconfigure**.

**Step 3** Click **Yes** in the confirmation box.

The fabric interconnect reboots and all traffic stops.

**Note** Starting with Cisco UCS Manager Release 4.2(3b), configuring the Ethernet breakout ports will not lead to Fabric Interconnect reboot.

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## Unified Ports

### Beacon LEDs for Unified Ports

Each port on the 6200 series fabric interconnect has a corresponding beacon LED. When the **Beacon LED** property is configured, the beacon LEDs illuminate, showing you which ports are configured in a given port mode.

You can configure the **Beacon LED** property to show you which ports are grouped in one port mode: either Ethernet or Fibre Channel. By default, the Beacon LED property is set to Off.



**Note** For unified ports on the expansion module, you can reset the **Beacon LED** property to the default value of **Off** during expansion module reboot.

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## Guidelines for Configuring Unified Ports

Consider the following guidelines and restrictions when configuring unified ports:

### Hardware and Software Requirements

Unified ports are supported on the following:

- Cisco UCS 6536 Fabric Interconnect with Cisco UCS Manager Release 4.2(3b) and later releases
- Cisco UCS 64108 Fabric Interconnect with Cisco UCS Manager Release 4.1 and later releases
- Cisco UCS 6454 Fabric Interconnect with Cisco UCS Manager Release 4.0 and later releases
- UCS 6300 Series Fabric Interconnects with Cisco UCS Manager Release 3.1 and later releases
- UCS 6200 Series Fabric Interconnects with Cisco UCS Manager Release 2.0 and later releases
- UCS 6324 Fabric Interconnects with Cisco UCS Manager Release 3.0 and later releases

Unified ports are not supported on 6100 series Fabric Interconnects, even if they are running Cisco UCS Manager, version 2.0.

### Port Mode Placement

Because the Cisco UCS Manager GUI interface uses a slider to configure the port mode for unified ports on a fixed or expansion module, it automatically enforces the following restrictions which limits how port modes can be assigned to unified ports. When using the Cisco UCS Manager CLI interface, these restrictions are enforced when you commit the transaction to the system configuration. If the port mode configuration violates any of the following restrictions, the Cisco UCS Manager CLI displays an error:

- Ethernet ports must be grouped together in a block. For each module (fixed or expansion), the Ethernet port block must start with the first port and end with an even numbered port.
- Fibre Channel ports must be grouped together in a block. For each module (fixed or expansion), the first port in the Fibre Channel port block must follow the last Ethernet port and extend to include the rest of the ports in the module. For configurations that include only Fibre Channel ports, the Fibre Channel block must start with the first port on the fixed or expansion module.




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**Note** On the Cisco UCS 6400 Series Fabric Interconnect, the Unified Port capability is restricted to first 16 ports. Only ports 1/1-1/16 can be configured as FC. The FC ports must be contiguous, followed by contiguous Ethernet ports.

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**Note** On the Cisco UCS 6536 Fabric Interconnect, the Unified Port capability is restricted to the first 16 ports. Only ports 1/1-1/16 can be configured as FC. The FC ports must be contiguous, followed by contiguous Ethernet ports.

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- On the Cisco UCS 6400 Series Fabric Interconnect connected to a Cisco UCS server, connecting more than 16 ports will result in an error.
- Alternating Ethernet and Fibre Channel ports is not supported on a single module.



**Example of a valid configuration**— Might include unified ports 1–16 on the fixed module configured in Ethernet port mode and ports 17–32 in Fibre Channel port mode. On the expansion module you could configure ports 1–4 in Ethernet port mode and then configure ports 5–16 in Fibre Channel mode. The rule about alternating Ethernet and Fibre Channel port types is not violated because this port arrangement complies with the rules on each individual module.

**Example of an invalid configuration**— Might include a block of Fibre Channel ports starting with port 16. Because each block of ports has to start with an odd-numbered port, you would have to start the block with port 17.



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**Note** The total number of uplink Ethernet ports and uplink Ethernet port channel members that can be configured on each fabric interconnect is limited to 31. This limitation includes uplink Ethernet ports and uplink Ethernet port channel members configured on the expansion module.

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## Cautions and Guidelines for Configuring Unified Uplink Ports and Unified Storage Ports

The following are cautions and guidelines to follow while working with unified uplink ports and unified storage ports:

- In an unified uplink port, if you enable one component as a SPAN source, the other component will automatically become a SPAN source.



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**Note** If you create or delete a SPAN source under the Ethernet uplink port, Cisco UCS Manager automatically creates or deletes a SPAN source under the FCoE uplink port. The same happens when you create a SPAN source on the FCoE uplink port.

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- You must configure a non default native VLAN on FCoE and unified uplink ports. This VLAN is not used for any traffic. Cisco UCS Manager will reuse an existing `fcoe-storage-native-vlan` for this purpose. This `fcoe-storage-native-vlan` will be used as a native VLAN on FCoE and unified uplinks.
- In an unified uplink port, if you do not specify a non default VLAN for the Ethernet uplink port the `fcoe-storage-native-vlan` will be assigned as the native VLAN on the unified uplink port. If the Ethernet port has a non default native VLAN specified as native VLAN, this will be assigned as the native VLAN for unified uplink port.
- When you create or delete a member port under an Ethernet port channel, Cisco UCS Manager automatically creates or deletes the member port under FCoE port channel. The same happens when you create or delete a member port in FCoE port channel.
- When you configure an Ethernet port as a standalone port, such as server port, Ethernet uplink, FCoE uplink or FCoE storage and make it as a member port for an Ethernet or FCoE port channel, Cisco UCS Manager automatically makes this port as a member of both Ethernet and FCoE port channels.
- When you remove the membership for a member port from being a member of server uplink, Ethernet uplink, FCoE uplink or FCoE storage, Cisco UCS Manager deletes the corresponding members ports from Ethernet port channel and FCoE port channel and creates a new standalone port.

- If you downgrade Cisco UCS Manager from release 2.1 to any of the prior releases, all unified uplink ports and port channels will be converted to Ethernet ports and Ethernet port channels when the downgrade is complete. Similarly, all the unified storage ports will be converted to appliance ports.
- For unified uplink ports and unified storage ports, when you create two interfaces, only one license is checked out. As long as either interface is enabled, the license remains checked out. The license will be released only if both the interfaces are disabled for a unified uplink port or a unified storage port.
- Cisco UCS 6100 series fabric interconnect switch can only support 1VF or 1VF-PO facing same downstream NPV switch.
- In Cisco UCS 6536 Fabric Interconnect to configure FC breakout port, you have to configure ports from the sequence from 1/36 through 1/33. FC breakout ports (36 - 33) cannot be configured unless the previous ports are FC breakout ports. Also, configuring a single (individual) FC breakout port is supported.  
Ports 33-36 can be configured only as FC Uplink Port or FC Storage Port when it is configured as unified port.

## Configuring the Beacon LEDs for Unified Ports

Complete the following task for each module for which you want to configure beacon LEDs.

### Procedure

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- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Depending upon the location of the unified ports for which you want to configure the beacon LEDs, click on one of the following:
- **Fixed Module**
  - **Expansion Module**
- Step 4** In the **Work** pane, click the **General** tab.
- Step 5** In the **Properties** area, click one of the following radio buttons in the **Beacon LED** field:
- **Off**—All physical LEDs are off.
  - **Eth**—The physical LEDs next to all Ethernet ports are on.
  - **Fc**—The physical LEDs next to all Fibre Channel ports are on.
- Step 6** Click **Save Changes**.
-

# Changing Port Modes

## Effect of Port Mode Changes on Data Traffic

Port mode changes can cause an interruption to the data traffic for the Cisco UCS domain. The length of the interruption and the traffic that is affected depend upon the configuration of the Cisco UCS domain and the module on which you made the port mode changes.



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**Tip** To minimize the traffic disruption during system changes, form a Fibre Channel uplink port-channel across the fixed and expansion modules.

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### Impact of Port Mode Changes on an Expansion Module

After you make port mode changes on an expansion module, the module reboots. All traffic through ports on the expansion module is interrupted for approximately one minute while the module reboots.

### Impact of Port Mode Changes on the Fixed Module in a Cluster Configuration

A cluster configuration has two fabric interconnects. After you make port changes to the fixed module, the fabric interconnect reboots. The impact on the data traffic depends upon whether or not you have configured the server vNICs to failover to the other fabric interconnect when one fails.

If you change the port modes on the expansion module of one fabric interconnect and then wait for that to reboot before changing the port modes on the second fabric interconnect, the following occurs:

- With server vNIC failover, traffic fails over to the other fabric interconnect and no interruption occurs.
- Without server vNIC failover, all data traffic through the fabric interconnect on which you changed the port modes is interrupted for approximately eight minutes while the fabric interconnect reboots.

If you change the port modes on the fixed modules of both fabric interconnects simultaneously, all data traffic through the fabric interconnects are interrupted for approximately eight minutes while the fabric interconnects reboot.

### Impact of Port Mode Changes on the Fixed Module in a Standalone Configuration

A standalone configuration has only one fabric interconnect. After you make port changes to the fixed module, the fabric interconnect reboots. All data traffic through the fabric interconnect is interrupted for approximately eight minutes while the fabric interconnect reboots.

## Configuring Port Modes for a 6536 Fabric Interconnect

In Cisco UCS 6536 Fabric Interconnects, port breakout is supported for Ethernet Ports (1-36) and Unified Ports (33-36). The unified ports can be configured as FC uplink ports (with sub-group of 4 in each unified port, a maximum 16 sub-ports can be configured as FC port).



**Caution** Changing the port mode can cause an interruption in data traffic and lead to immediate Fabric Interconnect reboot.

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

### Procedure

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- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
- **Yes**—To continue with configuring the port mode.
  - **No**—To exit without configuring the port mode, and, wait for an appropriate maintenance window.
- Step 6** In the **Configure Unified Ports** dialog box, use your mouse to drag the slider along the bar, from right to left, until the display shows the port-mode configuration that you want for the module.
- To unconfigure Unified Ports, use your mouse to drag the slider along the bar, from left to right. When you unconfigure the unified port, it defaults to Ethernet Uplink port.
- Step 7** Click **OK** to save your port-mode configuration.
- The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. If this occurs in a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.
- 

### What to do next

Configure the port types for the ports. You can right-click on any port in the module display above the slider and configure that port for an available port type.

## Configuring Port Modes for a 64108 Fabric Interconnect

On the UCS 64108 Fabric Interconnect, the first 16 ports are unified ports and can be configured as FC ports in groups of 4 or 8 ports by one of the following ways:

- First 4 ports - Ports 1 to 4 on the Fabric Interconnect
- First 8 ports - Ports 1 to 8 on the Fabric Interconnect



**Caution** Changing the port mode can cause an interruption in data traffic and lead to immediate Fabric Interconnect reboot.

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

### Procedure

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
  - **Yes**—To continue with configuring the port mode.
  - **No**—To exit without configuring the port mode, and, wait for an appropriate maintenance window.
- Step 6** In the **Configure Unified Ports** dialog box, use your mouse to drag the slider along the bar, from left to right, until the display shows the port-mode configuration that you want for the module.  
  
To unconfigure Unified Ports, use your mouse to drag the slider along the bar, from right to left. When you unconfigure the unified port, it defaults to Ethernet Uplink port.
- Step 7** If you need to configure port modes for the other module, repeat Steps 5 and 6.
- Step 8** Click **OK** to save your port-mode configuration.  
  
The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. If this occurs in a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.

### What to do next

Configure the port types for the ports. You can right-click on any port in the module display above the slider and configure that port for an available port type.

## Configuring Port Modes for a 6454 Fabric Interconnect

On the 6454 Fabric Interconnect, the first 16 ports are unified ports and can be configured as FC ports in groups of 4 or 8 ports by one of the following ways:

- First 4 ports - Ports 1 to 4 on the Fabric Interconnect
- First 8 ports - Ports 1 to 8 on the Fabric Interconnect



**Caution** Changing the port mode can cause an interruption in data traffic and lead to immediate Fabric Interconnect reboot.

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
- **Yes**—To continue with configuring the port mode.
  - **No**—To exit without configuring the port mode, and, wait for an appropriate maintenance window.
- Step 6** In the **Configure Unified Ports** dialog box, use your mouse to drag the slider along the bar, from left to right, until the display shows the port-mode configuration that you want for the module.
- To unconfigure Unified Ports, use your mouse to drag the slider along the bar, from right to left. When you unconfigure the unified port, it defaults to Ethernet Uplink port.
- Step 7** If you need to configure port modes for the other module, repeat Steps 5 and 6.
- Step 8** Click **OK** to save your port-mode configuration.
- The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. If this occurs in a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.

### What to do next

Configure the port types for the ports. You can right-click on any port in the module display above the slider and configure that port for an available port type.

## Configuring Port Modes for a 6332-16UP Fabric Interconnect

On the 6332-16UP fabric interconnect, the first 16 ports are unified ports and can be configured as FC ports in groups of 6 ports.



---

**Caution** Changing the port mode on either module can cause an interruption in data traffic because changes to the fixed module require a reboot of the fabric interconnect and changes on an expansion module require a reboot of that module .

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

---

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
- **Yes**—To continue with configuring the port mode.
  - **No**—To exit without configuring the port mode, and, wait for an appropriate maintenance window.
- Step 6** In the **Configure Unified Ports** dialog box, use your mouse to drag the slider along the bar, from left to right, until the display shows the port-mode configuration that you want for the module.
- To unconfigure Unified Ports, use your mouse to drag the slider along the bar, from right to left.
- If you change the port mode for a previously configured port, the port returns to an unconfigured state.
- Step 7** If you need to configure port modes for the other module, repeat Steps 5 and 6.
- Step 8** Click **OK** to save your port-mode configuration.
- The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. If this occurs in a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.

---

### What to do next

Configure the port types for the ports. You can right-click on any port in the module display above the slider and configure that port for an available port type.

## Configuring Port Modes for a 6324 Fabric Interconnect



**Caution** Changing the port mode on either module can cause an interruption in data traffic because changes to the fixed module require a reboot of the fabric interconnect and changes on an expansion module require a reboot of that module .

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
- **Yes**—To continue with configuring the port mode.
  - **No**—To exit without configuring the port mode, and, wait for an appropriate maintenance window.
- Step 6** In the **Configure Fixed Module Ports** dialog box, use your mouse to drag the slider along the bar until the display shows the port-mode configuration that you want for the module.
- To unconfigure the port-mode configuration, drag the slider in opposite direction.
- If you change the port mode for a previously configured port, the port returns to an unconfigured state.
- Step 7** If you need to configure port modes for the other module, repeat Steps 5 and 6.
- Step 8** Click **OK** to save your port-mode configuration.
- The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. If this occurs in a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.

---

### What to do next

Configure the port types for the ports. You can right-click on any port in the module display above the slider and configure that port for an available port type.



## Configuring Port Modes for a 6248 Fabric Interconnect



**Caution** Changing the port mode on either module can cause an interruption in data traffic because changes to the fixed module require a reboot of the fabric interconnect and changes on an expansion module require a reboot of that module .

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
- **Yes**—To continue with configuring the port mode.
  - **No**—To exit without configuring the port mode, and, wait for an appropriate maintenance window.
- Step 6** Click one of the following buttons to choose the module for which you want to configure the port modes:
- **Configure Fixed Module**
  - **Configure Expansion Module**
- Step 7** Use your mouse to drag the slider along the bar until the display shows the port-mode configuration that you want for the module.
- To unconfigure the port-mode configuration, drag the slider in opposite direction.
- If you change the port mode for a previously configured port, the port returns to an unconfigured state.
- Step 8** If you need to configure port modes for the other module, repeat Steps 6 and 7.
- Step 9** Click **OK** to save your port mode configuration.

Based on the module for which you configured the port modes, data traffic for the Cisco UCS domain is interrupted as follows:

- **Fixed module**—The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. In a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.

It takes about 8 minutes for the fixed module to reboot.

- **Expansion module**—The module reboots. All data traffic through ports in that module is interrupted.

It takes about 1 minute for the expansion module to reboot.

---

**What to do next**

Configure the port types for the ports. You can right-click on any port in the module display above the slider and configure that port for an available port type.

**Configuring Port Modes for a 6296 Fabric Interconnect**

**Caution** Changing the port mode on either module can cause an interruption in data traffic because changes to the fixed module require a reboot of the fabric interconnect and changes on an expansion module require a reboot of that module .

If the Cisco UCS domain has a cluster configuration that is set up for high availability and servers with service profiles that are configured for failover, traffic fails over to the other fabric interconnect and data traffic is not interrupted when the port mode is changed on the fixed module.

**Procedure**

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** 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 **Configure Unified Ports**.
- Step 5** Review the confirmation message and click one of the following:
- **Yes**—To open the **Configure Unified Ports** wizard and continue with configuring the port mode.
  - **No**—To exit without configuring the port mode and wait for an appropriate maintenance window.
- Step 6** On the **Configure Fixed Module Ports** page, do the following:
- a) Use your mouse to drag the slider along the bar until the displays shows the port mode configuration that you want for the fixed module.
  - b) If you want to configure the port type for a port, right-click on any port in the module display above the slider and configure that port for an available port type.
  - c) Do one of the following:
    - Click **Next** to configure the port mode for ports in expansion module 1.
    - If you do not wish to configure the port mode for ports on the expansion modules, continue with Step 9.
- If you change the port mode for a previously configured port, the port returns to an unconfigured state.
- Step 7** On the **Configure Expansion Module 1 Ports** page, do the following:
- a) Use your mouse to drag the slider along the bar until the displays shows the port mode configuration that you want for the expansion module.
  - b) If you want to configure the port type for a port, right-click on any port in the module display above the slider and configure that port for an available port type.
  - c) Do one of the following:
    - Click **Next** to configure the port mode for ports in expansion module 2.

- If you do not wish to configure the port mode for ports on the remaining expansion modules, continue with Step 9.

If you change the port mode for a previously configured port, the port returns to an unconfigured state.

**Step 8** If you need to configure port modes for expansion module 3, repeat Step 7.

**Step 9** Click **OK** to save your port mode configuration.

Based on the module for which you configured the port modes, data traffic for the Cisco UCS domain is interrupted as follows:

- **Fixed module**—The fabric interconnect reboots. All data traffic through that fabric interconnect is interrupted. In a cluster configuration that provides high availability and includes servers with vNICs that are configured for failover, traffic fails over to the other fabric interconnect and no interruption occurs.

It takes about 8 minutes for the fixed module to reboot.

- **Expansion module**—The module reboots. All data traffic through ports in that module is interrupted.

It takes about 1 minute for the expansion module to reboot.

---

## Reconfiguring a Port on a Fabric Interconnect

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to reconfigure.
- Step 4** Click the port or ports that you want to reconfigure.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click **Reconfigure**.
- Step 7** From the drop-down list, choose which way you want the port reconfigured.
- 

### Example: Reconfiguring an Uplink Ethernet Port as a Server Port

1. Expand the **Ethernet Ports** node and select the port you want to reconfigure.
2. Follow steps 5 and 6 above.
3. From the drop-down list choose **Configure as Server Port**.

## Enabling or Disabling a Port on a Fabric Interconnect

After you enable or disable a port on a fabric interconnect, wait for at least 1 minute before you re-acknowledge the chassis. If you re-acknowledge the chassis too soon, the pinning of server traffic from the chassis might not get updated with the changes to the port that you enabled or disabled.

You can enable or disable a port only when it is configured. If the port is unconfigured, the enable and disable options are not active.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the node for the ports that you want to enable or disable.
  - Step 4** Under the **Ethernet Ports** node, select a port.
  - Step 5** In the **Work** pane, click the **General** tab.
  - Step 6** In the **Actions** area, click **Enable Port** or **Disable Port**.
  - Step 7** If a confirmation dialog box displays, click **Yes**.
  - Step 8** Click **OK**.
- 

## Unconfiguring a Port on a Fabric Interconnect

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the node for the ports that you want to unconfigure.
  - Step 4** Under the **Ethernet Ports** node, select a port.
  - Step 5** In the **Work** pane, click the **General** tab.
  - Step 6** In the **Actions** area, click **Unconfigure**.
  - Step 7** If a confirmation dialog box displays, click **Yes**.
  - Step 8** Click **OK**.
- 

## Server Ports

### Automatic Configuration of Fabric Interconnect Server Ports

Starting with Cisco UCS Manager release 3.1(3), you can automatically configure the fabric interconnect server ports. The server **Port Auto-Discovery Policy** determines how the system reacts when a new rack

server, chassis, or FEX is added. By enabling this policy, Cisco UCS Manager automatically determines the type of device connected to the switch port and configures the switch port accordingly.



- Note**
- If you do not want a Cisco UCS C-Series appliance to be UCS Managed, pre-configure the appliance ports before connecting VIC ports to the Cisco UCS Fabric Interconnects.
  - The **Port Auto-Discovery Policy** is not applicable for servers connected through direct 25G port or 4x25g breakout on Cisco UCS 6454, UCS 64108, , and 6536 Fabric Interconnects.
  - The **Port Auto-Discovery Policy** is not supported on Cisco UCS 6324 Fabric Interconnects.

## Automatically Configuring Server Ports

### Procedure

- Step 1** In the Navigation pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Policies** > **Port Auto-Discovery Policy**.
- Step 3** In the **Port Auto-Discovery Policy** actions area, by default the policy is set to **Local**. The policy is determined and managed by Cisco UCS Manager. In this case, **Use Global** is visible in Cisco UCS Manager.
- To have the port auto-discovery policy managed by Cisco UCS Central, refer *Registering a Cisco UCS Domain with Cisco UCS Central* in the [Cisco UCS Manager Server Management Guide](#).
- Step 4** In the **Properties** area complete the following fields:

Name	Description
Owner field	If set to local, the policy is determined and managed by Cisco UCS Manager. If set to global, the policy is determined and managed by Cisco UCS Central.
Auto Configure Server Port	<ul style="list-style-type: none"> <li>• <b>Enabled</b> - Cisco UCS Manager automatically determines the type of server connected to a switch port and configures the switch port accordingly.</li> <li>• <b>Disabled</b> - Disables automatic configuration of fabric interconnect server ports.</li> </ul>

## Configuring Server Ports

All of the port types listed are configurable on both the fixed module and expansion module, including the server ports.

This task describes only one method of configuring ports. You can also configure ports from a right-click menu, or in the LAN Uplinks Manager.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name* > **Fixed Module** > **Ethernet Ports**.
  - Step 3** Click a port under the **Ethernet Ports** node.
  - Step 4** In the **Work** pane, click the **General** tab.
  - Step 5** In the **Actions** area, click **Reconfigure**.
  - Step 6** From the drop-down list, choose **Configure as Server Port**.
- 

## Modifying the Properties of a Server Port

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the node for the server port that you want to modify.
  - Step 4** Expand **Ethernet Ports**.
  - Step 5** Click the server port for which you want to modify the properties.
  - Step 6** In the **Work** pane, click the **General** tab.
  - Step 7** In the **Actions** area, click **Show Interface**.  
You may need to expand the pane or use the scroll bars in the **Properties** dialog box to see all the fields.
  - Step 8** In the **Properties** dialog box, modify the values as needed.
  - Step 9** Click **OK**.
- 

## Configuring a Server Port for Forward Error Correction

The N9K-C93180YC-FX3 in FEX mode connects to 25Gbps or 100Gbps server port on the Cisco UCS 6400 series Fabric Interconnects. To have the link-up at 25Gbps, the server port on Cisco UCS 6400 series Fabric Interconnect requires forward error correction (FEC) of CL-74. This CL-74 configuration on the server port is required only for connecting N9K-C93180YC-FX3 to Cisco UCS 6400 series Fabric Interconnects.

For Cisco UCS 6500 Series Fabric Interconnect, the N9K-C93180YC-FX3 in FEX mode connects to Fabric Interconnect at 100Gbps server port. To have the link at 100Gbps, the server port and Cisco UCS 6500 Series Fabric Interconnect requires forward error correction (FEC) of CL-91.



**Note** The CL-74 configuration is not applicable for other server port connectivity such as I/O module or direct-attached rack server.

**Table 3: FEC CL-74 Support Matrix**

Port Speed	FEC CL-74
1 Gbps	Not supported
10 Gbps	Not supported
25 Gbps	Supported
40 Gbps	Not supported
100 Gbps	Supported
Auto	Based on inserted transceiver's maximum supported speed

### Procedure

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the server ports that you want to configure.
- Step 4** Select **Show Interface**.
- Step 5** Choose **Eth Server**.
- Step 6** Select **Auto** or **CI74** to set the forward error correction mode as for the server port. **Auto** is the default option.
- Step 7** Select **Enabled** or **Disabled** to set the auto negotiation for the server port. **Enabled** is the default option.
- Step 8** Click **OK**.

**Note** Following are the mandatory configuration parameters on the server port for connecting to N9K-C93180YC-FX3:

- The FEC must be **Auto** for 100Gps server port.
- The FEC must be **CI74** for 25Gps server port.
- The auto-negotiation must be **Disabled** for 100Gps server port.

# Uplink Ethernet Ports

## Configuring Uplink Ethernet Ports

You can configure uplink Ethernet ports on either the fixed module or an expansion module.

This task describes only one method of configuring uplink Ethernet ports. You can also configure uplink Ethernet ports from a right-click menu.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the node for the ports that you want to configure.
  - Step 4** Click on one of the ports under the **Ethernet Ports** node.  
If you want to reconfigure a server port, appliance port, or FCoE storage port, expand the appropriate node.
  - Step 5** In the **Work** pane, click the **General** tab.
  - Step 6** In the **Actions** area, click **Reconfigure**.
  - Step 7** From the drop-down list choose **Configure as Uplink Port**.
- 

### What to do next

If desired, change the properties for the default flow control policy and admin speed of the uplink Ethernet port.

## Changing the Properties of an Uplink Ethernet Port

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to configure.
- Step 4** In the **Ethernet Ports** node, click the uplink Ethernet port that you want to change.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click **Show Interface**.
- Step 7** In the **Properties** dialog box, complete the following fields:
  - a) (Optional) In the **User Label** field, enter a label to identify the port.
  - b) From the **Flow Control Policy** drop-down list, select a flow control policy to determine how the port sends and receives IEEE 802.3x pause frames when the receive buffer fills.
  - c) In the **Admin Speed** field, click one of the following radio buttons:



- 1 Gbps
- 10 Gbps
- 25 Gbps
- 40 Gbps
- 100 Gbps

**Note** 25 Gbps can be selected for ports 1 to 48 only on Cisco UCS 6454 Fabric Interconnects. 40 Gbps and 100 Gbps speeds are only for ports 49 to 54 on Cisco UCS 6454 Fabric Interconnects.

25 Gbps can be selected for ports 1 to 96 only on Cisco UCS 64108 Fabric Interconnects. 40 Gbps and 100 Gbps speeds are only for ports 97 to 108 on Cisco UCS 64108 Fabric Interconnects.

25 Gbp, 40 Gbps and 100 Gbps can be selected for ports 1 to 36 only on Cisco UCS 6500 series Fabric Interconnects.

**Step 8** Click **OK**.

## Configuring an Ethernet Port for Forward Error Correction

You can configure forward error correction (FEC) for uplink Ethernet ports, Ethernet appliances, and FCoE uplinks for transceiver modules that operate at 25 Gbps and 100 Gbps speeds.

**Table 4: FEC CL-74 and FEC CL-91 Support Matrix**

Port Speed	FEC CL-74	FEC CL-91
1 Gbps	Not supported	Not supported
10 Gbps	Not supported	Not supported
25 Gbps	Supported	Supported
40 Gbps	Not supported	Not supported
100 Gbps	Not supported	Supported
Auto	Based on inserted transceiver's maximum supported speed	Based on inserted transceiver's maximum supported speed

### Procedure

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to configure.
- Step 4** Click on one of the ports under the **Ethernet Ports** node.

If you want to reconfigure a server port, appliance port, or FCoE storage port, expand the appropriate node.

- Step 5** Select **Show Interface**.
- Step 6** Choose **Uplink Eth Interface** or **Uplink FCoE Interface**.
- Step 7** Select **Auto**, **Cl74**, or **CL91** for the forward error correction mode.
- Step 8** Click **OK**.

This sets the forward error correction setting to auto, cl74, or cl91 for the Ethernet uplink port. For the , UCS 6400 Series, UCS 6500 Series Fabric Interconnects, forward error correction is only configurable for 25 Gbps or 100 Gbps port speeds.

## Q-in-Q Forwarding

QinQ is defined by IEEE 802.1ad. QinQ is also known as 802.1Q-in-802.1Q that helps to expand the VLAN space through the addition of 802.1Q tag to 802.1Q-tagged packets. This expansion is also termed as VLAN stacking or double VLAN.

In general, the QinQ packets have a standard format. In a VLAN stacking, one 802.11Q tagged packet is encapsulated in another 802.1Q tag. During transmission, packets are forwarded on the outer VLAN tag on the public network and on the inner VLAN tag for private network.



**Note** The 802.1Q supports 4096 VLANs.

## Configuring Q-in-Q Forwarding

You can configure Q-in-Q Forwarding on Cisco UCS 6400 Series Fabric Interconnects and Cisco UCS 6536 Fabric Interconnect.

To configure Q-in-Q Forwarding, do the following:

### Procedure

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > LAN Cloud**.
- Step 3** In the **Work** pane, click the **Global Policies** tab.
- Step 4** In the **Q-in-Q Forwarding** section, click to select **Enabled** radio button.
- Step 5** Click **Save Changes**.
- Step 6** If the **Q-in-Q Forwarding** option is successfully selected, a confirmation message displays. Click **OK** to close the dialog box.

## Unconfiguring Q-in-Q Forwarding

You can unconfigure Q-in-Q Forwarding on Cisco UCS 6400 Series Fabric Interconnects and Cisco UCS 6536 Fabric Interconnect. By default, Q-in-Q Forwarding is disabled.

To unconfigure Q-in-Q Forwarding, do the following:

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
  - Step 2** Expand **LAN > LAN Cloud**.
  - Step 3** In the **Work** pane, click the **Global Policies** tab.
  - Step 4** In the **Q-in-Q Forwarding** section, choose **Disabled**.
  - Step 5** Click **Save Changes**.
  - Step 6** If the **Q-in-Q Forwarding** option is successfully disabled, a confirmation message displays. Click **OK** to close the dialog box.
- 

## Appliance Ports

Appliance ports are only used to connect fabric interconnects to directly attached NFS storage.



---

**Note** When you create a new appliance VLAN, its IEEE VLAN ID is not added to the LAN Cloud. Therefore, appliance ports that are configured with the new VLAN remain down, by default, due to a pinning failure. To bring up these appliance ports, you have to configure a VLAN in the LAN Cloud with the same IEEE VLAN ID.

---

Cisco UCS Manager supports up to four appliance ports per fabric interconnect.

## Configuring an Appliance Port

You can configure Appliance ports on either the fixed module or an expansion module.

This task describes only one method of configuring appliance ports. You can also configure appliance ports from the **General** tab for the port.



---

**Note** If you configure an appliance port when the uplink port is down, Cisco UCS Manager may display an error message stating that the appliance port has failed. This message is controlled by the **Action on Uplink Fail** option in the associated Network Control Policy.

---

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to configure.
- Step 4** Under the **Ethernet Ports** node, select a port.
- If you want to reconfigure a server port, uplink Ethernet port, or FCoE storage port, expand the appropriate node.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click **Reconfigure**.
- Step 7** From the drop-down list, click **Configure as Appliance Port**.
- Step 8** If a confirmation dialog box displays, click **Yes**.
- Step 9** In the **Configure as Appliance Port** dialog box, complete the required fields.
- Step 10** In the **VLANs** area, do the following:
- a) In the **Port Mode** field, click one of the following radio buttons to select the mode you want to use for the port channel:
    - **Trunk**—Cisco UCS Manager GUI displays the VLANs Table that lets you choose the VLANs you want to use.
    - **Access**—Cisco UCS Manager GUI displays the **Select VLAN** drop-down list that allows you to choose a VLAN to associate with this port or port channel.

With either mode, you can click the **Create VLAN** link to create a new VLAN.

**Note** If traffic for the appliance port needs to traverse the uplink ports, you must also define each VLAN used by this port in the LAN cloud. For example, you need the traffic to traverse the uplink ports if the storage is also used by other servers, or if you want to ensure that traffic fails over to the secondary fabric interconnect if the storage controller for the primary fabric interconnect fails.
  - b) If you clicked the **Trunk** radio button, complete the required fields in the VLANs table.
  - c) If you clicked the **Access** radio button, choose a VLAN from the **Select VLAN** drop-down list.
- Step 11** (Optional) If you want to add an endpoint, check the **Ethernet Target Endpoint** check box and specify the name and MAC address.
- Step 12** Click **OK**.
- 

## Modifying the Properties of an Appliance Port

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.

- Step 3** Expand the node for the appliance port that you want to modify.
- Step 4** Expand **Ethernet Ports**.
- Step 5** Click the appliance port for which you want to modify the properties.
- Step 6** In the **Work** pane, click the **General** tab.
- Step 7** In the **Actions** area, click **Show Interface**.
- You may need to expand the pane or use the scroll bars in the **Properties** dialog box to see all the fields.
- Step 8** In the **Properties** dialog box, modify the values as needed.
- Step 9** Click **OK**.

## Configuring an Appliance Port for Forward Error Correction

You can configure forward error correction (FEC) for appliance ports that operate at 25 Gbps and 100 Gbps speeds that support this feature.

*Table 5: FEC CL-74 and FEC CL-91 Support Matrix*

Port Speed	FEC CL-74	FEC CL-91
1 Gbps	Not supported	Not supported
10 Gbps	Not supported	Not supported
25 Gbps	Supported	Supported
40 Gbps	Not supported	Not supported
100 Gbps	Not supported	Supported
Auto	Based on inserted transceiver's maximum supported speed	Based on inserted transceiver's maximum supported speed

### Procedure

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the Appliance ports that you want to configure.
- Step 4** Select **Show Interface**.
- Step 5** Choose **Appliance Port**.
- Step 6** Select **Auto** or **CL-74** or **CL-91** to set the forward error correction mode as for the Appliance port. **Auto** is the default option.
- Step 7** Select **Enabled** or **Disabled** to set the auto negotiation for the Appliance port. **Enabled** is the default option.
- Step 8** Click **OK**.

## Modifying an Appliance Breakout Port for Forward Error Correction

You can configure forward error correction (FEC) for appliance breakout ports.

*Table 6: FEC CL-74 and FEC CL-91 Support Matrix*

BreakoutType	Port Speed	Forward Error Correction	Allowed
25x4	25 Gbps	Auto	Yes
25x4	25 Gbps	CL74	Yes
25x4	25 Gbps	CL91	Yes
25x4	Auto	Auto	Yes
v	Auto	CL74	No
25x4	Auto	CL91	No

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the node for the Appliance ports that you want to configure.
  - Step 4** Select **Show Interface**.
  - Step 5** Choose **Appliance Port**.
  - Step 6** Select **Auto** or **CL-74** or **CL-91** to set the forward error correction mode as for the Appliance port. **Auto** is the default option.
  - Step 7** Select **Enabled** or **Disabled** to set the auto negotiation for the Appliance port. **Enabled** is the default option.
  - Step 8** Click **OK**.
- 

## FCoE and Fibre Channel Storage Ports

### Configuring an Ethernet Port as an FCoE Storage Port

You can configure FCoE storage ports on either the fixed module or an expansion module.

This task describes only one method of configuring FCoE storage ports. You can also configure FCoE storage ports from the **General** tab for the port.

#### Before you begin

The Fibre Channel switching mode must be set to Switching for these ports to be valid. The storage ports cannot function in end-host mode.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Depending upon the location of the ports you want to configure, expand one of the following:
- **Fixed Module**
  - **Expansion Module**
- Step 4** Click one or more of the ports under the **Ethernet Ports** node.  
If you want to reconfigure an uplink Ethernet port, server port, or appliance port, expand the appropriate node.
- Step 5** Right-click the selected port or ports and choose **Configure as FCoE Storage Port**.  
On Cisco UCS 6454 Fabric Interconnects, ports 49-54 cannot be configured as FCoE storage ports.  
On Cisco UCS 64108 Fabric Interconnects, port 97-108 cannot be configured as FCoE storage ports.
- Step 6** If a confirmation dialog box displays, click **Yes**.
- Step 7** Click **OK**.
- 

## Configuring a Fibre Channel Storage Port

This task describes only one method of configuring FC storage ports. You can also configure FC storage ports from the **General** tab for the port.

### Before you begin

The Fibre Channel switching mode must be set to Switching for these ports to be valid. The storage ports cannot function in end-host mode.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the **Expansion Module** node.
- Step 4** Click one or more of the ports under the **FC Ports** node.
- Step 5** Right-click the selected port or ports and choose **Configure as FC Storage Port**.
- Step 6** If a confirmation dialog box displays, click **Yes**.
- Step 7** Click **OK**.
-

## Restoring an Uplink Fibre Channel Port

This task describes only one method of restoring an FC storage port to function as an uplink FC port. You can also reconfigure FC storage ports from the **General** tab for the port.

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the **Expansion Module** node.
  - Step 4** Click one or more of the ports under the **FC Ports** node.
  - Step 5** Right-click the selected port or ports and choose **Configure as Uplink Port**.
  - Step 6** If a confirmation dialog box displays, click **Yes**.
  - Step 7** Click **OK**.
- 

## Converting FC Storage Port to FC Uplink Port

You can configure an FC Uplink port on either a fixed module or an expansion module.

This task describes only one method of configuring FC Uplink ports. You can also configure FC uplink ports from a right-click menu for the port.




---

**Important** For Cisco UCS 6400 Series and Cisco UCS 6500 Series Fabric Interconnects, the fill pattern is greyed out and is automatically set to IDLE.

---

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
  - Step 3** Expand the node for the ports that you want to configure.
  - Step 4** Under the **FC Ports** node, select any **Storage** port.
  - Step 5** In the **Work** pane, click the **General** tab.
  - Step 6** From the **Actions** area, select **Configure as Uplink Port**.
  - Step 7** If a confirmation dialog box displays, click **Yes**.
  - Step 8** The Cisco UCS Manager GUI displays a success message.

In the **Actions** area, **Configure as Uplink Port** becomes grayed out and **Configure as FC Storage Port** becomes active.

---



# Configuring FCoE Uplink for Forward Error Correction

You can configure forward error correction (FEC) for FCoE uplinks that operate at 25 Gbps and 100 Gbps speeds that support this feature.

Cisco UCS Manager Release 4.2(3b) introduces support for FCoE uplink ports in Fibre Channel switch mode on the Cisco UCS 6536 Fabric Interconnect.

**Table 7: FEC CL-74 and FEC CL-91 Support Matrix**

Port Speed	FEC CL-74	FEC CL-91
1 Gbps	Not supported	Not supported
10 Gbps	Not supported	Not supported
25 Gbps	Supported	Supported
40 Gbps	Not supported	Not supported
100 Gbps	Not supported	Supported
Auto	Based on inserted transceiver's maximum supported speed	Based on inserted transceiver's maximum supported speed

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	UCS-A# <b>scope fc-uplink</b>	Enters FCoE uplink mode.
<b>Step 2</b>	UCS-A /fc-uplink # <b>scope fabric a   b</b>	Enters fabric mode for the specified fabric.
<b>Step 3</b>	UCS-A /fc-uplink/fabric # <b>scope fcoeinterface slot-id port-id</b>	Enters FCoE interface mode for the specified interface.
<b>Step 4</b>	Required: UCS-A /fc-uplink/fabric/fcoeinterface # <b>set fec {auto  cl74   cl91}</b>	Sets the forward error correction setting as auto, cl74, or cl91 for the FCoE uplink. For the UCS 6400 Series Fabric Interconnect and Cisco UCS 6536 Fabric Interconnect, forward error correction is only configurable for 25 Gbps or 100 Gbps port speeds.
<b>Step 5</b>	UCS-A /fc-uplink/fabric/fcoeinterface # <b>commit-buffer</b>	Commits the transaction to the system configuration.

## Example

The following example shows how to enable forward error correction cl74 on an interface for FCoE uplink 35 on slot 1 of fabric A, and commits the transaction:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # scope fcoeinterface 1 35
UCS-A /fc-uplink/fabric/fcoeinterface # set fec c174
UCS-A /fc-uplink/fabric/fcoeinterface # commit-buffer
```

## FCoE Uplink Ports

FCoE uplink ports are physical Ethernet interfaces between the fabric interconnects and the upstream Ethernet switch, used for carrying FCoE traffic. With this support the same physical Ethernet port can carry both Ethernet traffic and Fibre Channel traffic.

FCoE uplink ports connect to upstream Ethernet switches using the FCoE protocol for Fibre Channel traffic. This allows both the Fibre Channel traffic and Ethernet traffic to flow on the same physical Ethernet link.




---

**Note** FCoE uplinks and unified uplinks enable the multi-hop FCoE feature, by extending the unified fabric up to the distribution layer switch.

---

You can configure the same Ethernet port as any of the following:

- **FCoE uplink port**—As an FCoE uplink port for only Fibre Channel traffic.
- **Uplink port**—As an Ethernet port for only Ethernet traffic.
- **Unified uplink port**—As a unified uplink port to carry both Ethernet and Fibre Channel traffic.

## Configuring FCoE Uplink Ports

You can configure an FCoE Uplink port on either a fixed module or an expansion module.

This task describes only one method of configuring FCoE Uplink ports. You can also configure FCoE uplink ports from a right-click menu or from the General tab for the port.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to configure.
- Step 4** Under the **Ethernet Ports** node, select any **Unconfigured** port.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click **Reconfigure**.
- Step 7** From the drop down options, select **Configure as FCoE Uplink Port**.
- Step 8** If a confirmation dialog box displays, click **Yes**.
- Step 9** The Cisco UCS Manager GUI displays a success message.

In the **Properties** area, the **Role** changes to **Fcoe Uplink**.

---

## Unified Storage Ports

Unified storage involves configuring the same physical port as both an Ethernet storage interface and an FCoE storage interface. You can configure any appliance port or FCoE storage port as a unified storage port. To configure a unified storage port, you must have the fabric interconnect in Fibre Channel switching mode.

In a unified storage port, you can enable or disable individual FCoE storage or appliance interfaces.

- In an unified storage port, if you do not specify a non-default VLAN for the appliance port, the FCoE-storage-native-vlan will be assigned as the native VLAN on the unified storage port. If the appliance port has a non-default native VLAN specified as native VLAN, this will be assigned as the native VLAN for the unified storage port.
- When you enable or disable the appliance interface, the corresponding physical port is enabled or disabled. So when you disable the appliance interface in unified storage, even if the FCoE storage is enabled, it goes down with the physical port.
- When you enable or disable the FCoE storage interface, the corresponding VFC is enabled or disabled. So when the FCoE storage interface is disabled in a unified storage port, the appliance interface will continue to function normally.

## Configuring an Appliance Port as a Unified Storage Port

You can configure a unified storage port either from an appliance port or from an FCoE storage port. You can also configure the unified storage port from an unconfigured port. If you start from an unconfigured port, you will assign either an appliance configuration or an FCoE storage configuration to the port, and then will add another configuration to enable it as a unified storage port.



---

**Important** Make sure the fabric interconnect is in Fibre Channel switching mode.

---

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Depending on the location of the ports you want to configure, expand one of the following:
- **Fixed Module**
  - **Expansion Module**
- Step 4** Under the **Ethernet Ports** node, select any the port that is already configured as an appliance port. In the **Work** pane, under the **General** tab, in the **Properties** area, the **Role** will show as **Appliance Storage**.

- Step 5** In the **Actions** area, click **Reconfigure**.
- Step 6** From the pop-up menu, select **Configure as FCoE Storage** port.
- Step 7** If a confirmation dialog box displays, click **Yes**.
- Step 8** The Cisco UCS Manager GUI displays a success message. In the **Properties** area, the **Role** changes to **Unified Storage**.
- 

## Unconfiguring a Unified Storage Port

You can unconfigure and remove both configurations from the unified connect port. Or you can unconfigure either of them and retain the other on the port.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to unconfigure.
- Step 4** Under the **Ethernet Ports** node, select the port that you want to unconfigure.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click **Unconfigure**. You will see the following options:
- **Unconfigure FCoE Storage Port**
  - **Unconfigure Appliance Port**
  - **Unconfigure both**
- Step 7** Select one of the unconfigure options.
- Step 8** If a confirmation dialog box displays, click **Yes**.
- Step 9** The Cisco UCS Manager GUI displays a success message. In the **Properties** area, the **Role** changes to based on your unconfigure selection.
- 

## Unified Uplink Ports

When you configure an Ethernet uplink and an FCoE uplink on the same physical Ethernet port, it is called a unified uplink port. You can individually enable or disable either the FCoE or Ethernet interfaces independently.

- Enabling or disabling the FCoE uplink results in the corresponding VFC being enabled or disabled.
- Enabling or disabling an Ethernet uplink results in the corresponding physical port being enabled or disabled.

If you disable an Ethernet uplink, it disables the underlying physical port in a unified uplink. Therefore, even when the FCoE uplink is enabled, the FCoE uplink also goes down. But if you disable an FCoE uplink, only the VFC goes down. If the Ethernet uplink is enabled, it can still function properly in the unified uplink port.

## Configuring Unified Uplink Ports

You can configure the unified uplink port from either of the following:

- From an existing FCoE uplink port or Ethernet uplink port
- From an unconfigured uplink port

You can configure the unified uplink port on either a fixed module or on an expansion module.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to configure.
- Step 4** Under the **Ethernet Ports** node, select a port.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Properties** area, make sure the **Role** shows as **Fcoe Uplink**.
- Step 7** In the **Actions** area, click **Reconfigure**.
- Step 8** From the drop-down options, select **Configure as Uplink Port**.
- Step 9** If a confirmation dialog box displays, click **Yes**.
- Step 10** The Cisco UCS Manager GUI displays a success message.
- In the **Properties** area, the **Role** changes to **Unified Uplink**.
- 

## Unconfiguring Unified Uplink Port

You can unconfigure and remove both configurations from the unified uplink port. Or you can unconfigure either the FCoE configuration or Ethernet port configuration and retain the other on the port.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Fabric Interconnects** > *Fabric\_Interconnect\_Name*.
- Step 3** Expand the node for the ports that you want to unconfigure.
- Step 4** Under the **Ethernet Ports** node, select the port you want to unconfigure.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click **Unconfigure**. Select one of the following options:
- **Unconfigure FCoE Uplink Port**

- **Unconfigure Uplink Port**
- **Unconfigure both**

- Step 7** If a confirmation dialog box displays, click **Yes**.
- Step 8** The Cisco UCS Manager GUI displays a success message. In the **Properties** area, the **Role** changes based on your unconfigure selection.
- Step 9** Click **Save Changes**.

## Uplink Ethernet Port Channels

An uplink Ethernet port channel allows you to group several physical uplink Ethernet ports (link aggregation) to create one logical Ethernet link to provide fault-tolerance and high-speed connectivity. In Cisco UCS Manager, you create a port channel first and then add uplink Ethernet ports to the port channel. You can add up to 16 uplink Ethernet ports to a port channel.



- Important** The state of a configured port changes to unconfigured in the following scenarios:
- The port is deleted or removed from a port channel. The port channel can be of any type, such as, uplink or storage.
  - A port channel is deleted.



- Note** Cisco UCS uses Link Aggregation Control Protocol (LACP), not Port Aggregation Protocol (PAgP), to group the uplink Ethernet ports into a port channel. If the ports on the upstream switch are not configured for LACP, the fabric interconnects treat all ports in an uplink Ethernet port channel as individual ports, and therefore forward packets.

## Creating an Uplink Ethernet Port Channel

### Procedure

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > LAN Cloud**.
- Step 3** Expand the node for the fabric interconnect where you want to add the port channel.
- Step 4** Right-click the **Port Channels** node and choose **Create Port Channel**.
- Step 5** In the **Set Port Channel Name** panel, specify the ID and name, then click **Next**.
- Step 6** In the **Add Ports** panel, specify the ports that you want to add.

**Note** Cisco UCS Manager warns you if you select a port that has been configured as a server port. You can click **Yes** in the dialog box to reconfigure that port as an uplink Ethernet port and include it in the port channel.

**Step 7** Click **Finish**.

---

## Enabling an Uplink Ethernet Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
  - Step 2** Expand **LAN > LAN Cloud**.
  - Step 3** Expand the node for the fabric interconnect that includes the port channel you want to enable.
  - Step 4** Expand the **Port Channels** node.
  - Step 5** Right-click the port channel you want to enable and choose **Enable Port Channel**.
  - Step 6** If a confirmation dialog box displays, click **Yes**.
- 

## Disabling an Uplink Ethernet Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
  - Step 2** Expand **LAN > LAN Cloud**.
  - Step 3** Expand the node for the fabric interconnect that includes the port channel you want to disable.
  - Step 4** Expand the **Port Channels** node.
  - Step 5** Right-click the port channel you want to disable and choose **Disable Port Channel**.
- 

## Adding Ports to and Removing Ports from an Uplink Ethernet Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > LAN Cloud > Fabric > Port Channels**.
- Step 3** Click the port channel to which you want to add or remove ports.
- Step 4** In the **Work** pane, click the **General** tab.
- Step 5** In the **Actions** area, click **Add Ports**.

- Step 6** In the **Add Ports** dialog box, do one of the following:
- To add ports, choose one or more ports in the **Ports** table, and then click the >> button to add the ports to the **Ports in the port channel** table.
  - To remove ports, choose one or more ports in the **Ports in the port channel** table, and then click the << button to remove the ports from the port channel and add them to the **Ports** table.
- Step 7** Click **OK**.
- 

## Deleting an Uplink Ethernet Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > LAN Cloud**.
- Step 3** Expand the node for the fabric interconnect where you want to delete the port channel.
- Step 4** Click the **Port Channels** node.
- Step 5** In the **General** tab for the **Port Channels** node, choose the port channel that you want to delete.
- Step 6** Right-click the port channel and choose **Delete**.
- 

## Appliance Port Channels

An appliance port channel allows you to group several physical appliance ports to create one logical Ethernet storage link for the purpose of providing fault-tolerance and high-speed connectivity. In Cisco UCS Manager, you create a port channel first and then add appliance ports to the port channel. You can add up to eight appliance ports to a port channel.

## Creating an Appliance Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > Appliances**.
- Step 3** Expand the node for the fabric interconnect where you want to add the port channel.
- Step 4** Right-click the **Port Channels** node and choose **Create Port Channel**.
- Step 5** In the **Set Port Channel Name** panel of the **Create Port Channel** wizard, complete the required fields to specify the identity and other properties of the port channel.
- You can create a LAN pin group, network control policy, and flow control policy from this panel.
- Step 6** In the **VLANs** area, specify the **Port Mode** and other information for the VLANs.



You can create a VLAN from this panel.

- Step 7** (Optional) If you want to add an endpoint, click the **Ethernet Target Endpoint** check box to specify the name and MAC address.
- Step 8** Click **Next**.
- Step 9** In the **Add Ports** panel of the **Create Port Channel** wizard, specify the ports that you want to add.
- Note** Cisco UCS Manager warns you if your configuration could cause issues with service profiles or port configurations. You can click **Yes** in the dialog box if you want to create the port channel despite those potential issues.
- Step 10** Click **Finish**.
- 

## Enabling an Appliance Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > Appliances**.
- Step 3** Expand the node for the fabric interconnect that includes the port channel you want to enable.
- Step 4** Expand the **Port Channels** node.
- Step 5** Right-click the port channel you want to enable and choose **Enable Port Channel**.
- Step 6** If a confirmation dialog box displays, click **Yes**.
- 

## Disabling an Appliance Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > Appliances**.
- Step 3** Expand the node for the fabric interconnect that includes the port channel you want to disable.
- Step 4** Expand the **Port Channels** node.
- Step 5** Right-click the port channel that you want to disable and choose **Disable Port Channel**.
- Step 6** If a confirmation dialog box displays, click **Yes**.
-

## Deleting an Appliance Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
  - Step 2** Expand **LAN > Appliances**.
  - Step 3** Expand the node for the fabric interconnect that includes the port channel you want to delete.
  - Step 4** Expand the **Port Channels** node.
  - Step 5** Right-click the port channel you want to enable and choose **Delete**.
  - Step 6** If a confirmation dialog box displays, click **Yes**.
- 

## Adding Ports and Removing Ports within an Appliance Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **LAN**.
  - Step 2** Expand **LAN > Appliances > Fabric > Port Channels**.
  - Step 3** Click the port channel to which you want to add ports, or from which to remove ports.
  - Step 4** In the **Work** pane, click the **General** tab.
  - Step 5** In the **Actions** area, click **Add Ports**.
  - Step 6** In the **Add Ports** dialog box, do one of the following:
    - To add ports, choose one or more ports in the **Ports** table, and then click the >> button to add the ports to the **Ports in the port channel** table.
    - To remove ports, choose one or more ports in the **Ports in the port channel** table, and then click the << button to remove the ports from the port channel and add them to the **Ports** table.
  - Step 7** Click **OK**.
- 

## Cisco UCS Mini Scalability Ports

The Cisco UCS 6324 Fabric Interconnect contains a scalability port as well as four unified ports. The scalability port is a 40GB QSFP+ breakout port that, with proper cabling, can support four 1G or 10G SFP+ ports. A scalability port can be used as a licensed server port for supported Cisco UCS rack servers, as an appliance port, or as an FCoE port.

In the Cisco UCS Manager GUI, the scalability port is displayed as **Scalability Port 5** below the **Ethernet Ports** node. The individual breakout ports are displayed as **Port 1** through **Port 4**.

In the Cisco UCS Manager CLI, the scalability port is not displayed, but the individual breakout ports are displayed as **Br-Eth1/5/1** through **Br-Eth1/5/4**.

## Configuring Scalability Ports

To configure any type of supported port or port member on the scalability port, expand the **Ethernet Ports** mode, then the **Scalability Port 5** node.

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** In the **Equipment** tab, expand **Fabric Interconnects** > *Fabric\_Interconnect\_Name* > **Fixed Module** > **Ethernet Ports** > **Scalability Port 5**.
- Step 3** Click on a port under the **Scalability Port 5** node.
- Step 4** Configure the port as needed.
- 

## Creating a Threshold Definition

### Procedure

---

- Step 1** In the **Navigation** pane, click **Admin**.
- Step 2** In the **Admin** tab, expand **All** > **Stats Management** > **fabric** > **Internal LAN** > **thr-policy-default**.
- Step 3** Click **Create Threshold Class**.
- Step 4** In the **Choose Statistics Class** > **Create Threshold Class**, choose **NI Ether Error Stats** statistics class to monitor network interface ports. You can configure a custom threshold for these ports from the **Stat Class** drop-down list.
- Step 5** Click **Next**.
- Step 6** In the **Threshold Definitions** screen of the **Create Threshold Class** wizard, click **Add**.
- The **Create Threshold Definition** dialog box opens.
- From the **Property Type** field, choose the threshold property that you want to define for the class.
  - In the **Normal Value** field, enter the desired value for the property type.
  - In the **Alarm Triggers (Above Normal Value)** fields, check one or more of the following check boxes:
    - **Critical**
    - **Major**
    - **Minor**
    - **Warning**
    - **Condition**
    - **Info**
  - In the **Up and Down** fields, enter the range of values that should trigger the alarm.
  - In the **Alarm Triggers (Below Normal Value)** fields, click one or more of the following check boxes:

- **Critical**
- **Major**
- **Minor**
- **Warning**
- **Condition**
- **Info**

- f) In the **Up and Down** fields, enter the range of values that should trigger the alarm.
- g) Click **Ok**.

## Monitoring a Fabric Port

### Procedure

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** On the **Equipment** tab, expand **Chassis > IO Modules > IO Module 1 > Fabric Ports**.
- Step 3** Click the fabric port that you want to monitor.
- Step 4** Click one of the following tabs to view the status of the fabric:

Option	Description
<b>General</b>	Provides an overview of the status of the fabric, including a summary of any faults, a summary of the fabric properties, and a physical display of the fabric and its components.
<b>Faults</b>	Provides details of the faults generated by the fabric.
<b>Events</b>	Provides details of the events generated by the fabric.
<b>Statistics</b>	Provides statistics about the fabric and its components. You can view these statistics in tabular format or in chart format.

## Policy-Based Port Error Handling

If Cisco UCS Manager detects any errors on active network interface (NI) ports, and if the error-disable feature has been implemented, Cisco UCS Manager automatically disables the respective fabric interconnect port that is connected to the NI port that had errors. When a fabric interconnect port is error disabled, it is effectively shut down and no traffic is sent or received on that port.

The error-disable function serves two purposes:

- It lets you know which fabric interconnect port is error-disabled and that the connected NI Port has errors.
- It eliminates the possibility that this port can cause the failure of other ports other ports connected to the same Chassis/FEX. Such a failure can occur when the NI port has errors, which can ultimately cause serious network issues. The error-disable function helps prevent these situations.

## Configuring Error-Based Action

### Procedure

---

- Step 1** In the **Navigation** pane, click **Admin**.
- Step 2** Expand **Admin > All > Stats Management > fabric > Internal LAN > thr-policy-default > etherNiErrStats**.
- Step 3** Select a delta property.
- Step 4** In the **Work** pane, click the **General** tab.
- Step 5** To implement an error-disable state on a fabric interconnect port, check the **Disable FI port when fault is raised** check box.
- Step 6** To enable auto recovery, in the **Enable Auto Recovery** field, select **Enable**.
- Step 7** To specify the time after which the port can automatically be re-enabled, in the **Time (in minutes)** field, type the desired value.
- Step 8** Click **Save Changes**.
- 

## FCoE Port Channels

An FCoE port channel allows you to group several physical FCoE ports to create one logical FCoE port channel. At a physical level, the FCoE port channel carries FCoE traffic over an Ethernet port channel. So an FCoE port channel with a set of members is essentially an Ethernet port channel with the same members. This Ethernet port channel is used as a physical transport for FCoE traffic.

For each FCoE port channel, Cisco UCS Manager creates a VFC internally and binds it to an Ethernet port channel. FCoE traffic received from the hosts is sent over the VFC the same way as the FCoE traffic is sent over Fibre Channel uplinks.

## Creating an FCoE Port Channel

### Procedure

---

- Step 1** In the **Navigation** pane, click **SAN**.
- Step 2** Expand **SAN > SAN Cloud**.
- Step 3** Expand the node for the fabric where you want to create the port channel.
- Step 4** Right-click the **FCoE Port Channels** node and choose **Create FCoE Port Channel**.

- Step 5** In the **Set Port Channel Name** panel of the **Create FCoE Port Channel** wizard, specify the ID and name, then click **Next**.
- Step 6** In the **Add Ports** panel of the **Create FCoE Port Channel** wizard, specify the ports that you want to add.
- Step 7** Click **Finish**.
- 

## Deleting an FCoE Port Channel

### Procedure

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- Step 1** In the **Navigation** pane, click **SAN**.
- Step 2** On the **SAN** tab, expand **SAN > SAN Cloud > Fabric > FCoE Port Channels**.
- Step 3** Right-click the port channel you want to delete and choose **Delete**.
- Step 4** If a confirmation dialog box displays, click **Yes**.
- 

## Unified Uplink Port Channel

When you create an Ethernet port channel and an FCoE port channel with the same ID, it is called a unified uplink port channel. When the unified port channel is created, a physical Ethernet port channel and a VFC are created on the fabric interconnect with the specified members. The physical Ethernet port channel is used to carry both Ethernet and FCoE traffic. The VFC binds FCoE traffic to the Ethernet port channel.

The following rules will apply to the member port sets of the unified uplink port channel:

- The Ethernet port channel and FCoE port channel on the same ID, must have the same set of member ports.
- When you add a member port channel to the Ethernet port channel, Cisco UCS Manager adds the same port channel to FCoE port channel as well. Similarly, adding a member to the FCoE port channel adds the member port to the Ethernet port channel.
- When you delete a member port from one of the port channels, Cisco UCS Manager automatically deletes the member port from the other port channel.

If you disable an Ethernet uplink port channel, it disables the underlying physical port channel in a unified uplink port channel. Therefore, even when the FCoE uplink is enabled, the FCoE uplink port channel also goes down. If you disable an FCoE uplink port channel, only the VFC goes down. If the Ethernet uplink port channel is enabled, it can still function properly in the unified uplink port channel.

## Adapter Port Channels

An adapter port channel groups into one logical link all the physical links going from a Cisco UCS Virtual Interface Card (VIC) into an I/O.

Adapter port channels are created and managed internally by Cisco UCS Manager when it detects that the correct hardware is present. Adapter port channels cannot be configured manually. Adapter port channels are viewable using the Cisco UCS Manager GUI or the Cisco UCS Manager CLI.

## Viewing Adapter Port Channels

### Procedure

- 
- Step 1** In the **Navigation** pane, click **Equipment**.
  - Step 2** On the **Equipment** tab, expand **Equipment** > **Chassis** > *Chassis\_Number* > **Servers** > *Server\_Number* > **Interface Cards**
  - Step 3** Click the adapter for which you want to view the adapter port channels.
  - Step 4** In the **Work** pane, click the **DCE Interfaces** tab.
  - Step 5** To view details of the adapter port channel, click the link in the **Port Channel** column.
- 

## Fabric Port Channels

Fabric port channels allow you to group several of the physical links from an IOM and IFM (IOM for Cisco UCS X-Series Servers) to a fabric interconnect into one logical link for redundancy and bandwidth sharing. As long as one link in the fabric port channel remains active, the fabric port channel continues to operate.

If the correct hardware is connected, fabric port channels are created by Cisco UCS Manager in the following ways:

- During chassis discovery according to the settings configured in the chassis discovery policy.
- After chassis discovery according to the settings configured in the chassis connectivity policy for a specific chassis.

For each IOM and IFM (IOM for Cisco UCS X-Series Servers) there is a single fabric port channel. Each uplink connecting an IOM and IFM (IOM for Cisco UCS X-Series Servers) to a fabric interconnect can be configured as a discrete link or included in the port channel, but an uplink cannot belong to more than one fabric port channel. For example, if a chassis with two IOMs is discovered and the chassis discovery policy is configured to create fabric port channels, Cisco UCS Manager creates two separate fabric port channels: one for the uplinks connecting IOM-1 and another for the uplinks connecting IOM-2. No other chassis can join these fabric port channels. Similarly, uplinks belonging to the fabric port channel for IOM-1 cannot join the fabric port channel for IOM-2.

## Load Balancing Over Ports

Load balancing traffic among ports between IOMs and fabric interconnects uses the following criteria for hashing.

- For Ethernet traffic:
  - Layer 2 source and destination address

Layer 3 source and destination address

Layer 4 source and destination ports

- For FCoE traffic:

Layer 2 source and destination address

Source and destination IDs (SID and DID) and Originator Exchange ID (OXID)

In this example, a 2200 Series IOM module is verified by connecting iom X (where X is the chassis number).

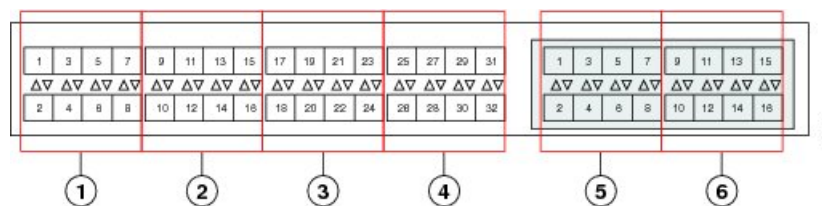
```
show platform software fwmctrl nifport
(....)
Hash Parameters:
  l2_da: 1 l2_sa: 1 l2_vlan: 0
  l3_da: 1 l3_sa: 1
  l4_da: 1 l4_sa: 1
FCoE l2_da: 1 l2_sa: 1 l2_vlan: 0
FCoE l3_did: 1 l3_sid: 1 l3_oxid: 1
```

## Cabling Considerations for Fabric Port Channels

When you configure the links between the Cisco UCS 2200 Series FEX and a Cisco UCS 6200 series fabric interconnect in fabric port channel mode, the available virtual interface namespace (VIF) on the adapter varies depending on where the FEX uplinks are connected to the fabric interconnect ports.

Inside the 6248 fabric interconnect there are six sets of eight contiguous ports, with each set of ports managed by a single chip. When all uplinks from an FEX are connected to a set of ports managed by a single chip, Cisco UCS Manager maximizes the number of VIFs used in service profiles deployed on the blades in the chassis. If uplink connections from an IOM are distributed across ports managed by separate chips, the VIF count is decreased.

**Figure 8: Port Groups for Fabric Port Channels**



**Caution** Adding a second link to a fabric-port-channel port group is disruptive and will automatically increase the available amount of VIF namespace from 63 to 118. Adding further links is not disruptive and the VIF namespace stays at 118.



**Caution** Linking a chassis to two fabric-port-channel port groups does not affect the VIF namespace unless it is manually acknowledged. The VIF namespace is then automatically set to the smaller size fabric port-channel port group usage (either 63 or 118 VIFs) of the two groups.



For high availability cluster-mode applications, we strongly recommend symmetric cabling configurations. If the cabling is asymmetric, the maximum number of VIFs available is the smaller of the two cabling configurations.

For more information on the maximum number of VIFs for your Cisco UCS environment, see the Configuration Limits document for your hardware and software configuration.

## Configuring a Fabric Port Channel

### Procedure

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- Step 1** To include all links from the IOM to the fabric interconnect in a fabric port channel during chassis discovery, set the link grouping preference in the chassis discovery policy to port channel.
- See the *Configuring the Chassis/FEX Discovery Policy* section in *Cisco UCS Manager Infrastructure Management Guide, Release 3.2*.
- Step 2** To include links from an individual chassis in a fabric port channel during chassis discovery, set the link grouping preference in the chassis connectivity policy to port channel.
- See the *Configuring a Chassis Connectivity Policy* section in *Cisco UCS Manager Infrastructure Management Guide, Release 3.2*.
- Step 3** After chassis discovery, enable or disable additional fabric port channel member ports.
- See [Enabling or Disabling a Fabric Port Channel Member Port, on page 66](#)
- 

### What to do next

To add or remove chassis links from a fabric port channel after making a change to the chassis discovery policy or the chassis connectivity policy, reacknowledge the chassis. Chassis reacknowledgement is not required to enable or disable chassis member ports from a fabric port channel.

## Viewing Fabric Port Channels

### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment** > **Chassis** > *Chassis Number* > **IO Modules**.
- Step 3** Click the IOM for which you want to view the fabric port channels.
- Step 4** In the **Work** pane, click the **Fabric Ports** tab.
- Step 5** To view details of the fabric port channel, click the link in the **Port Channel** column.
-

## Enabling or Disabling a Fabric Port Channel Member Port

### Procedure

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- Step 1** In the **Navigation** pane, click **LAN**.
- Step 2** Expand **LAN > Internal LAN > Fabric > Port Channels**.
- Step 3** Expand the port channel for which you want to enable or disable a member port.
- Step 4** Click the Ethernet interface for the member port that you want to enable or disable.
- Step 5** In the **Work** pane, click the **General** tab.
- Step 6** In the **Actions** area, click one of the following:
- **Enable Interface**
  - **Disable Interface**
- Step 7** If a confirmation dialog box displays, click **Yes**.
- 

## Configuring Server Ports with the Internal Fabric Manager

### Internal Fabric Manager

The Internal Fabric Manager provides a single interface through which you can configure server ports for a fabric interconnect in a Cisco UCS domain. The Internal Fabric Manager is accessible from the **General** tab for that fabric interconnect.

Some of the configuration that you can do in the Internal Fabric Manager can also be done in nodes on the **Equipment** tab, on the **LAN** tab, or in the LAN Uplinks Manager.

### Launching the Internal Fabric Manager

#### Procedure

---

- Step 1** In the **Navigation** pane, click **Equipment**.
- Step 2** Expand **Equipment > Fabric Interconnects > Fabric\_Interconnect\_Name**.
- Step 3** Click **Fixed Module**.
- Step 4** In the **Work** pane, click **Internal Fabric Manager** in the **Actions** area.
- The Internal Fabric Manager opens in a separate window.
-

## Configuring a Server Port with the Internal Fabric Manager

### Procedure

---

- Step 1** In the Internal Fabric Manager, click the down arrows to expand the **Unconfigured Ports** area.
  - Step 2** Right-click the port that you want to configure and choose **Configure as Server Port**.
  - Step 3** If a confirmation dialog box displays, click **Yes**.
  - Step 4** If you complete all of the tasks in the Internal Fabric Manager, click **OK**.
- 

## Unconfiguring a Server Port with the Internal Fabric Manager

### Procedure

---

- Step 1** In the Internal Fabric Manager, click the server port in the **Server Ports** table.
  - Step 2** Click **Unconfigure Port**.
  - Step 3** If a confirmation dialog box displays, click **Yes**.
  - Step 4** If you complete all of the tasks in the Internal Fabric Manager, click **OK**.
- 

## Enabling a Server Port with the Internal Fabric Manager

### Procedure

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- Step 1** In the Internal Fabric Manager, click the server port in the **Server Ports** table.
  - Step 2** Click **Enable Port**.
  - Step 3** If a confirmation dialog box displays, click **Yes**.
  - Step 4** If you complete all of the tasks in the Internal Fabric Manager, click **OK**.
- 

## Disabling a Server Port with the Internal Fabric Manager

### Procedure

---

- Step 1** In the Internal Fabric Manager, click the server port in the **Server Ports** table.
- Step 2** Click **Disable Port**.
- Step 3** If a confirmation dialog box displays, click **Yes**.

**Step 4** If you complete all of the tasks in the Internal Fabric Manager, click **OK**.

---