



Lan Ports and Port Channels

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Unified Ports on the Cisco UCS 6200 Series and 6324 Fabric Interconnects

Unified ports are ports on the Cisco UCS 6200 Series and 6324 Fabric Interconnects that you can configure to carry either Ethernet or Fibre Channel traffic. A Cisco UCS domain cannot use these un-reserved ports until you configure them.



Note When you configure a port on a fabric interconnect, the administrative state is automatically set to enabled. If the port is connected to another device, this may cause traffic disruption. You can disable the port after configuring it. Configurable beacon LEDs indicate which unified ports are configured for the selected port mode.

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



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

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.

Data Traffic Interruption from Port Mode Changing

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



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

Impact of Port Mode on an Expansion Module

After you make port mode changes on an expansion module, the module reboots. All traffic through port on the expansion module is interrupted for approximately 1 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.

When 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.

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 6200 series fabric interconnect with Cisco UCS Manager, version 2.0.

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.
- Alternating Ethernet and Fibre Channel ports is not supported.

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.

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.

Special Considerations for UCS Manager CLI Users

Because the Cisco UCS Manager CLI does not validate port mode changes until you commit the buffer to the system configuration, it is easy to violate the grouping restrictions if you attempt to commit the buffer before creating at least two new interfaces. To prevent errors, we recommend that you wait to commit your changes to the system configuration until you have created new interfaces for all of the unified ports changing from one port mode to another.

Committing the buffer before configuring multiple interfaces will result in an error, but you do not need to start over. You can continue to configure unified ports until the configuration satisfies the aforementioned requirements.

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.



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.

- 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 a member port for an Ethernet or FCoE port channel, Cisco UCS Manager automatically makes this port 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.

Configuring the Port Mode



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

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.

In the Cisco UCS Manager CLI, there are no new commands to support Unified Ports. Instead, you change the port mode by scoping to the mode for the desired port type and then creating a new interface. When you create a new interface for an already configured slot ID and port ID, UCS Manager deletes the previously configured interface and creates a new one. If a port mode change is required because you configure a port that previously operated in Ethernet port mode to a port type in Fibre Channel port mode, UCS Manager notes the change.

Expansions modules are not supported with Cisco UCS Mini.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope <i>port-type-mode</i>	<p>Enters the specified port type mode for one of the following port types:</p> <p>eth-server For configuring server ports.</p> <p>eth-storage For configuring Ethernet storage ports and Ethernet storage port channels.</p> <p>eth-traffic-mon For configuring Ethernet SPAN ports.</p> <p>eth-uplink For configuring Ethernet uplink ports.</p> <p>fc-storage For configuring Fibre Channel storage ports.</p> <p>fc-traffic-mon For configuring Fibre Channel SPAN ports.</p> <p>fc-uplink For configuring Fibre Channel uplink ports and Fibre Channel uplink port channels.</p>
Step 2	UCS-A <i>/port-type-mode</i> # scope fabric { a b }	Enters the specified port type mode for the specified fabric.

	Command or Action	Purpose
Step 3	UCS-A <i>/port-type-mode/fabric</i> # create interface <i>slot-id port-id</i>	Creates an interface for the specified port type. If you are changing the port type from Ethernet port mode to Fibre Channel port mode, or vice-versa, the following warning appears: Warning: This operation will change the port mode (from Ethernet to FC or vice-versa). When committed, this change will require the module to restart.
Step 4	Create new interfaces for other ports belonging to the Ethernet or Fibre Channel port block.	There are several restrictions that govern how Ethernet and Fibre Channel ports can be arranged on a fixed or expansion module. Among other restrictions, it is required that you change ports in groups of two. Violating any of the restrictions outlined in the <i>Guidelines and Recommendations for Configuring Unified Ports</i> section will result in an error.
Step 5	UCS-A <i>/port-type-mode/fabric/interface</i> # commit-buffer	Commits the transaction to the system 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. Changing the port mode for both sides at once results in both fabric interconnects rebooting simultaneously and a complete loss of traffic until both fabric interconnects are brought back up.

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.

Example

The following example changes ports 3 and 4 on slot 1 from Ethernet uplink ports in Ethernet port mode to uplink Fibre Channel ports in Fibre Channel port mode:



Note This example is not applicable for Cisco UCS 6500 Series Fabric Interconnect.

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # create interface 1 3
Warning: This operation will change the port mode (from Ethernet to FC or vice-versa).
When committed, this change will require the fixed module to restart.
UCS-A /fc-uplink/fabric/interface* # up
```

```
UCS-A /fc-uplink/fabric* #create interface 1 4
Warning: This operation will change the port mode (from Ethernet to FC or vice-versa).
When committed, this change will require the fixed module to restart.
UCS-A /fc-uplink/fabric/interface* #commit-buffer
```

Configuring Breakout Ports

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.

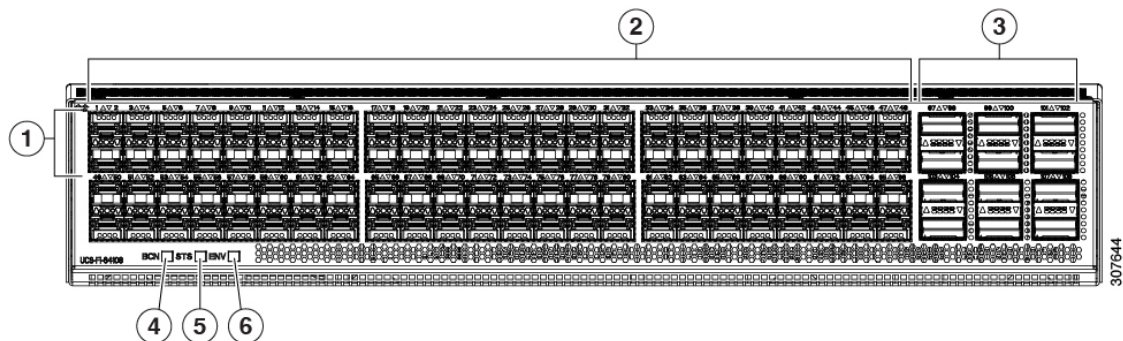


Note Cisco UCS Manager does not support connection of FEX, chassis, blade, IOM, or adapters (other than VIC adapters) to the uplink ports of Fabric Interconnect.

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 1: 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"> • 10/25 Gbps Ethernet or FCoE • 8/16/32 Gbps Fibre Channel 	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"> • 10/25 Gbps Ethernet or FCoE • 1 Gbps Ethernet
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 at 40/100G can be configured as uplink, FCoE, or appliance port. Ports 97-108 after breakout to 10/25G can be configured as uplink, appliance, FCoE, or for direct-connect rack server connectivity.

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.

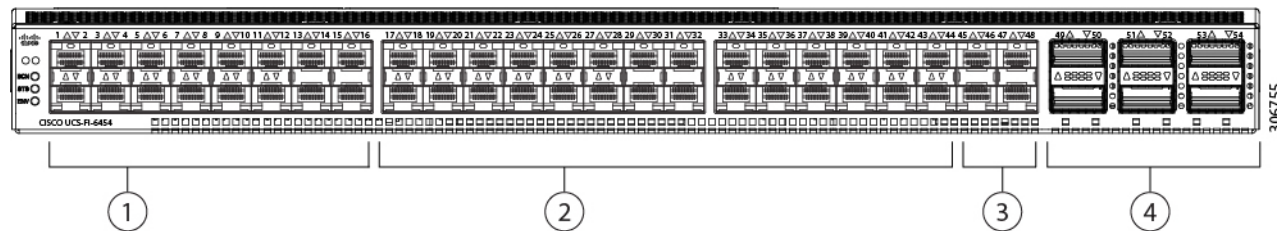
Starting with Cisco UCS Manager Release 4.1(3a), you can connect Cisco UCS Rack servers with VIC 1455 and 1457 adapters, to the uplink ports 49 to 54 (40/100 Gbps Ethernet or FCoE) in Cisco UCS 6454 Fabric Interconnects.



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 2: 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 at 40/100G can be configured as uplink, FCoE, or appliance port. Ports 49-54 after breakout to 10/25G can be configured as uplink, appliance, FCoE, or for direct-connect rack server connectivity.

Port Breakout Functionality on Cisco UCS 6300 Series Fabric Interconnects

About Breakout Ports

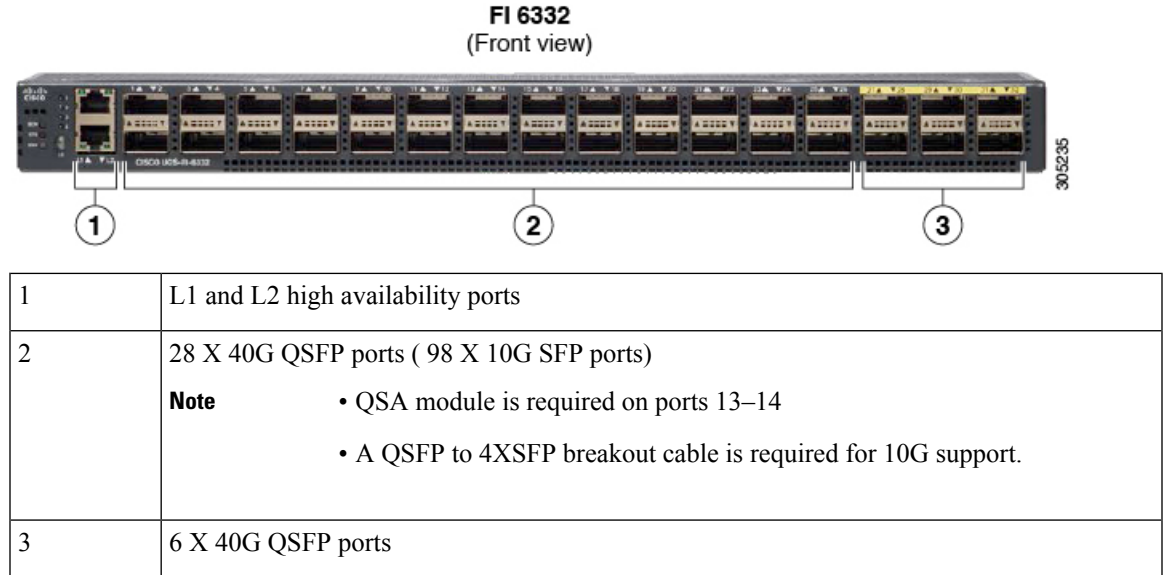
Cisco UCS fabric interconnect 6300 series supports splitting a single QSFP port into four 10G ports using a supported breakout cable. By default, there are 32 ports in the 40G mode. These 40G ports are numbered in a 2-tuple naming convention. For example, the second 40G port is numbered as 1/2. The process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

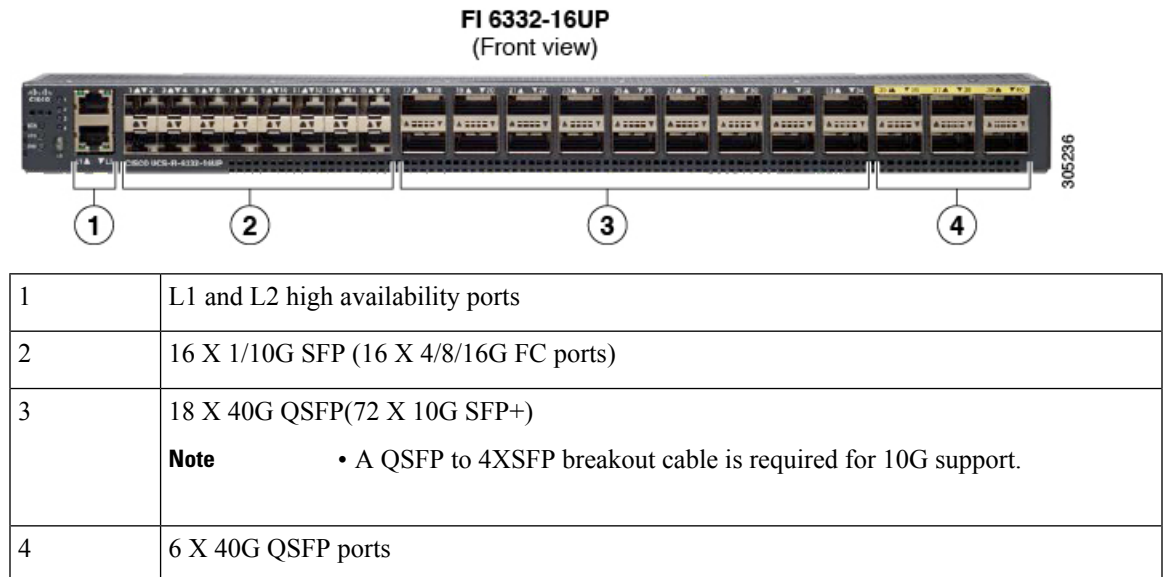
The following image shows the front view for the Cisco UCS 6332 series fabric interconnects, and includes the ports that may support breakout port functionality:

Figure 3: Cisco UCS 6332 Series Fabric Interconnects Front View



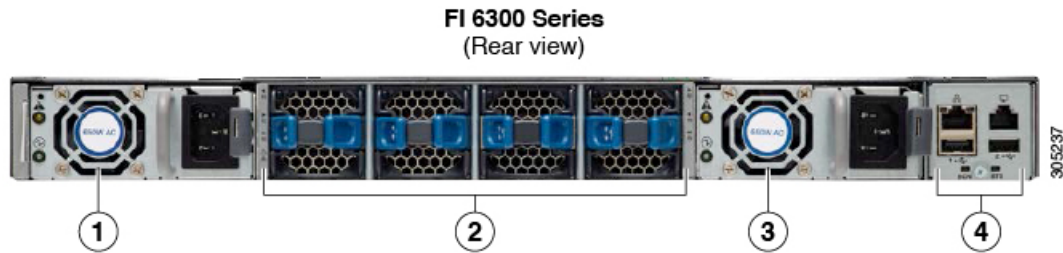
The following image shows the front view for the Cisco UCS 6332-16UP series fabric interconnects, and includes the ports that may support breakout port functionality:

Figure 4: Cisco UCS 6332-16UP Series Fabric Interconnects Front View



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

Figure 5: 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 Note • Auto-negotiate behavior is not supported on ports 27–32.
Cisco UCS 6332-16UP	17–34	1–16, 35–40 Note • Auto-negotiate behavior is not supported on ports 35–40



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

Configuring Multiple Breakout Ports

On a UCS 6300 Fabric Interconnect, you can specify a 40 Gigabit Ethernet port and create four 10 Gigabit Ethernet unconfigured breakout ports. On a UCS 6454 Fabric Interconnect, you can specify a 40 or 100 Gigabit Ethernet port and create four 10 or 25 Gigabit Ethernet unconfigured breakout ports.

On a UCS 6536 Fabric Interconnect, you can specify a 40 or 100 Gigabit Ethernet port and create four 10 or 25 Gigabit Ethernet unconfigured breakout ports. Also, configuring breakout ports on a port do not require Fabric Interconnect reboot.

Before you begin

Before configuring a breakout port, view the port status using the **show port** command.

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope cabling	Enters the cabling mode.
Step 2	UCS-A /cabling # scope fabric {a b}	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /cabling/fabric # create breakout slot-id port-id	Creates the breakout port on the selected slot and port.
Step 4	UCS-A /cabling/fabric/breakout* # set breakouttype {10g-4x 25g-4x}	Specifies the type of breakout port on UCS 6454 and UCS 6536 Fabric Interconnects.
Step 5	UCS-A /cabling/fabric/breakout* # up	Returns you to fabric mode. Repeat steps 3 and 5 for each breakout port on UCS 6300 Fabric Interconnect Repeat steps 3, 4, and 5 for each breakout port on a UCS 6454 and UCS 6536.
Step 6	UCS-A /cabling/fabric/breakout* # commit-buffer	Commits the transaction to the server.

Example

The following example creates breakout ports 1/1 through 1/4 on a UCS 6300 Fabric Interconnect and commits the transaction:

```
UCS-A# scope cabling
UCS-A /cabling # scope fabric a
UCS-A /cabling/fabric # create breakout 1 1
Warning: Port breakout create action reboots FI and any existing configurations on 40G port
will be erased.!
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 2
Warning: Port breakout create action reboots FI and any existing configurations on 40G port
will be erased.!
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 3
Warning: Port breakout create action reboots FI and any existing configurations on 40G port
will be erased.!
UCSM--A /cabling/fabric/breakout* # up
UCSM-shiva-a-A /cabling/fabric* # create breakout 1 4
Warning: Port breakout create action reboots FI and any existing configurations on 40G port
will be erased.!
UCSM--A /cabling/fabric/breakout* # commit-buffer
```

The following example creates breakout ports 1/49 through 1/52 on a UCS 6454 Fabric Interconnect, sets the breakout type, and commits the transaction:

```
UCS-A# scope cabling
UCS-A /cabling # scope fabric a
UCS-A /cabling/fabric # create breakout 1 49
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 50
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 51
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCSM--A /cabling/fabric/breakout* # up
UCSM-shiva-a-A /cabling/fabric* # create breakout 1 52
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCS-A /cabling/fabric/breakout* # commit-buffer
```

The following example creates breakout ports 1/50 through 1/53 on a UCS 64108 Fabric Interconnect, sets the breakout type, and commits the transaction:

```
UCS-A# scope cabling
UCS-A /cabling # scope fabric a
UCS-A /cabling/fabric # create breakout 1 50
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 51
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 52
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCSM--A /cabling/fabric/breakout* # up
UCSM-shiva-a-A /cabling/fabric* # create breakout 1 53
UCS-A /cabling/fabric/breakout* # set breakouttype 10g-4x
UCS-A /cabling/fabric/breakout* # commit-buffer
```

The following example creates breakout ports 1/17 through 1/20 on a UCS 6536 Fabric Interconnect, sets the breakout type, and commits the transaction:

```
UCS-A# scope cabling
UCS-A /cabling # scope fabric a
UCS-A /cabling/fabric # create breakout 1 17
UCS-A /cabling/fabric/breakout* # set breakouttype 25g-4x
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 18
UCS-A /cabling/fabric/breakout* # set breakouttype 25g-4x
UCS-A /cabling/fabric/breakout* # up
UCS-A /cabling/fabric* # create breakout 1 19
UCS-A /cabling/fabric/breakout* # set breakouttype 25g-4x
UCSM--A /cabling/fabric/breakout* # up
UCSM-shiva-a-A /cabling/fabric* # create breakout 1 20
UCS-A /cabling/fabric/breakout* # set breakouttype 25g-4x
UCS-A /cabling/fabric/breakout* # commit-buffer
```

What to do next

Verify that you created breakout ports on the fabric interconnect and on the NXOS switch. On the fabric interconnect use the **show breakout** command in cabling fabric mode for the specified fabric. In NXOS, use the **show interface brief** command.

Configuring a Breakout Ethernet Uplink Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # create aggr-interface slot-numaggregate port-num	Creates the interface for the specified aggregate (main) Ethernet uplink port.
Step 4	UCS-A /eth-uplink/fabric/aggr-interface* # create br-interface breakout-port-num	Creates an interface for the specified breakout Ethernet uplink port.
Step 5	UCS-A /eth-uplink/fabric/aggr-interface/br-interface # commit-buffer	Commits the transaction to the server.

Example

The following example shows how to create an interface for breakout Ethernet uplink port 1 of the aggregate port 21 on slot 1 of fabric A:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # enter aggr-interface 1 21
UCS-A /eth-uplink/fabric/aggr-interface # create br-interface 1
UCS-A /eth-uplink/fabric/aggr-interface/br-interface*# commit-buffer
```

The following example shows how to create interfaces for breakout Ethernet uplink ports 1-4 of the aggregate port 49 on slot 1 of fabric A on a UCS 6454 fabric interconnect, and commit the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # create aggr-interface 1 49
UCS-A /eth-uplink/fabric/aggr-interface* # create br-interface 1
UCS-A /eth-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /eth-uplink/fabric/aggr-interface* # create br-interface 2
UCS-A /eth-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /eth-uplink/fabric/aggr-interface* # create br-interface 3
UCS-A /eth-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /eth-uplink/fabric/aggr-interface* # create br-interface 4
UCS-A /eth-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /eth-uplink/fabric/aggr-interface* # commit-buffer
UCS-A /eth-uplink/fabric/aggr-interface #
```

The following example shows the breakout configuration for ports 1/49/1 to 1/49/4 of fabric A on a UCS 6454 fabric interconnect:

```
UCS-A# scope fabric-interconnect a
UCS-A /fabric-interconnect # show port
Ether Port:
Slot Aggr      Port  Port Oper State  Mac                               Role   Xcvr
```

1	49	1	Sfp	Not	Present	8C:60:4F:BC:C4:D4	Unknown	N/A
1	49	2	Sfp	Not	Present	8C:60:4F:BC:C4:D5	Unknown	N/A
1	49	3	Sfp	Not	Present	8C:60:4F:BC:C4:D6	Unknown	N/A
1	49	4	Sfp	Not	Present	8C:60:4F:BC:C4:D7	Unknown	N/A

Configuring a Breakout Ethernet Uplink Port Channel Member

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A# /eth-uplink # scope fabric {a b}	Enters Ethernet uplink mode for the specified fabric.
Step 3	UCS-A# /eth-uplink/fabric # scope fcoe-port-channel fcoe-port-channel	Enters port channel for the specified FCoE uplink port.
Step 4	UCS-A /eth-uplink/fabric/port-channel/fcoe-port-channel # enter aggr-interface slot-id port-id	Enters the interface for the specified aggregate(main) FCoE uplink port.
Step 5	UCS-A /eth-uplink/fabric/port-channel/member-aggr-port # create br-member-port breakout-port-num	Creates the FCoE uplink port channel member.
Step 6	UCS-A /eth-uplink/fabric/port-channel/member-aggr-port/br-member-port # commit-buffer Example: The following example creates an Ethernet uplink port channel member for an Ethernet port on port 2, and commits the transaction: UCS-A# scope eth-storage UCS-A /eth-uplink # scope fabric a UCS-A /eth-uplink/fabric # scope fcoe-port-channel 51 UCS-A /eth-uplink/fabric/port-channel/member-aggr-port # create br-member-port 2 UCS-A /eth-uplink/fabric/port-channel/member-aggr-port/br-member-port* # commit-buffer	Commits the transaction to the server.

Configuring Ethernet Uplink Breakout Port as a Pin Group Target

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.

	Command or Action	Purpose
Step 2	UCS-A# /eth-uplink/pin-group # enter pin-group <i>pin-group-name</i>	Enters the pin group with the specified name.
Step 3	UCS-A# /eth-uplink/pin-group # set target {a b} breakout-port <i>slot-num aggregate-port-num breakout-port-num</i>	Sets the selected target as the breakout port.
Step 4	UCS-A # /eth-uplink/pin-group # commit-buffer Example: The following example sets the pin group target to breakout port 2 of the aggregate port 1 on slot 1, on fabric A , and commits the transaction: UCS-A# scope eth-uplink UCS-A /eth-uplink # enter pin-group test UCS-A /eth-uplink/pin-group # set target a breakout-port 1 1 2 UCS-A /eth-uplink/pin-group* # commit-buffer	Commits the transaction to the server.

Configuring Breakout Appliance Ports

You can follow the below steps to configure appliance breakout ports for both Cisco UCS 6400 Series Fabric Interconnect and Cisco UCS 6500 Series Fabric Interconnect:

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A# /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A# /eth-storage/fabric # enter aggr-interface <i>slot-num aggregate-port-num</i>	Enters the interface for the specified aggregate(main) appliance port.
Step 4	UCS-A# /eth-storage/fabric/port-channel/member-aggr-port # create br -interface <i>breakout-port-num</i>	Creates an interface for the specified breakout appliance port.
Step 5	UCS-A# /eth-storage/fabric/port-channel/member-aggr-port/br-member-port # commit-buffer Example: The following example creates an interface for an appliance port 1 of the aggregate port 20 on slot 1 of fabric B, and commits the transaction:	Commits the transaction to the server.

	Command or Action	Purpose
	<pre>UCS-A# scope eth-storage UCS-A /eth-storage # scope fabric a UCS-A /eth-storage/fabric # enter aggr-interface 1 20 UCS-A /eth-storage/fabric/aggr-interface # create br-interface 1 UCS-A /eth-storage/fabric/aggr-interface/br-interface* # commit-buffer</pre> <p>Example:</p> <p>Note If the port is only connected to 100G SFP which is broken out in 25x4 breakout port then when creating an appliance port, the default speed for a breakout port would be Auto.</p>	

Configuring a Breakout Appliance Port Channel Member

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A# /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A# /eth-storage # scope port-channel <i>port-channel-num</i>	Enters Ethernet storage mode for the specified port-channel.
Step 4	UCS-A# /eth-storage/fabric # enter aggr-interface <i>slot-num aggregate-port-num</i>	Enters the interface for the specified aggregate(main) appliance port.
Step 5	UCS-A /eth-storage/fabric/port-channel # enter member-aggr-port <i>slot-id port-id</i>	Enters the appliance port channel member port.
Step 6	UCS-A /eth-storage/fabric/port-channel/member-aggr-port # create br-member-port <i>breakout-port-num</i>	Creates the appliance port channel member.
Step 7	UCS-A /eth-storage/fabric/port-channel/member-aggr-port/br-member-port # commit-buffer	Commits the transaction to the server.

	Command or Action	Purpose
	<p>The following example creates an appliance port channel member for an appliance port 2, and commits the transaction:</p> <pre>UCS-A# scope eth-storage UCS-A /eth-storage # scope fabric a UCS-A /eth-storage/fabric # scope port-channel 21 UCS-A /eth-storage/fabric/port-channel # enter member-aggr-port 1 2 UCS-A /eth-storage/fabric/port-channel/member-aggr-port # create br-member-port 2 UCS-A /eth-storage/fabric/port-channel/member-aggr-port/br-member-port* # commit-buffer</pre>	

Configuring Breakout FCoE Storage Ports

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-storage	Enters Fibre Channel storage mode.
Step 2	UCS-A# /fc-storage scope fabric {a b}	Enters Fibre Channel storage mode for the specified fabric.
Step 3	UCS-A# /fc-storage/fabric enter aggr-interface slot-num aggregate port-num	Enter the interface for the specified aggregate(main) Fibre Channel storage port.
Step 4	UCS-A# /fc-storage/fabric/aggr-interface # create br-interface br-fcoe breakout-port-num	Creates an interface for the specified breakout Fibre Channel storage port.
Step 5	<pre>UCS-A# /fc-storage/fabric/aggr-interface/br-interface/br-fcoe # commit-buffer</pre> <p>Example:</p> <p>The following example creates an interface for a breakout Fibre Channel storage port 1 of the aggregate port 21 on slot 1 of fabric a, and commits the transaction:</p> <pre>UCS-A# scope fc-storage UCS-A /fc-storage # scope fabric a UCS-A /fc-storage/fabric # enter aggr-interface 1 21 UCS-A /fc-storage/fabric/aggr-interface # create br-interface 1 UCS-A /eth-uplink/fabric/aggr-interface/br-interface/br-fcoe # commit-buffer</pre>	Commits the transaction to the server.

Configuring a Breakout FCoE Uplink Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FC Uplink mode.
Step 2	UCS-A# /fc-uplink scope fabric {a b}	Enters FC - Uplink mode for the specific fabric.
Step 3	UCS-A# /fc-uplink/fabric enter aggr-interface slot-num aggregate port-num	Enters interface for the specified aggregate(main) FCoE uplink port.
Step 4	UCS-A# /fc-uplink/fabric/aggr-interface # create br-fcoeinterface breakout-port-num	Creates an interface for the specified breakout FCoE uplink port.
Step 5	UCS-A# /fc-uplink/fabric/aggr-interface/ br-fcoeinterface # commit-buffer Example: The following example shows how to create an interface for breakout FCoE uplink port 1 of the aggregate port 20 on slot 1 of fabric A: UCS-A# scope eth-uplink UCS-A /fc-uplink # scope fabric a UCS-A /fc-uplink/fabric # enter aggr-interface 1 20 UCS-A /fc-uplink/fabric/aggr-interface # create br-fcoeinterface 1 UCS-A /fc-uplink/fabric/aggr-interface/br-fcoeinterface # commit-buffer	Commits the transaction to the server.

Configuring an FCoE Port Channel Member

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Ethernet storage mode.
Step 2	UCS-A# /fc-uplink # scope fabric {a b}	
Step 3	UCS-A# /fc-uplink/fabric # scope fcoe-port-channel fcoe-port-num	
Step 4	UCS-A /fc-uplink/fabric/port-channel # enter aggr-interface slot-num port-num aggregate-port-num	Enters the FCoE port channel member port.
Step 5	UCS-A /fc-uplink/fabric/port-channel/member-aggr-port # create br-member-port breakout-port-num	Creates the FCoE port channel member for the specified breakout port.

	Command or Action	Purpose
Step 6	<pre>UCS-A /fc-uplink/fabric/port-channel/member-aggr-port/br-member-port # commit-buffer</pre> <p>Example:</p> <p>The following example creates a breakout FCoE port channel member port 4 on aggregate port 21, and commits the transaction:</p> <pre>UCS-A# scope eth-storage UCS-A /fc-uplink # scope fabric a UCS-A /fc-uplink/fabric # scope port-channel 51 UCS-A /fc-uplink/fabric/port-channel # enter member-aggr-port 1 21 UCS-A /fc-uplink/fabric/port-channel/member-aggr-port # create br-member-port 4 UCS-A /fc-uplink/fabric/port-channel/member-aggr-port/br-member-port* # commit-buffer</pre>	Commits the transaction to the server.

Configuring a Breakout VLAN Member Port

Procedure

	Command or Action	Purpose
Step 1	USA-A# scope eth-uplink	Enters Ethernet uplink mode for the specified fabric.
Step 2	USA-A /eth-uplink # scope vlan id	Enters VLAN mode.
Step 3	USA-A /eth-uplink/vlan # enter member-aggr-port {a b} slot-id port id	Enters an interface for the specified fabric, main aggregate port, and subport. breakout VLAN member port.
Step 4	USA-A /eth-uplink/vlan/member-aggr-port # create br-member-port breakout-port-name	Creates an interface for the specified breakout VLAN member port.
Step 5	<pre>USA-A /eth-uplink/vlan/member-aggr-port/br-member-port # commit-buffer</pre> <p>Example:</p> <p>The following example creates an interface for a VLAN member on the aggregate port 4 on slot 1 of breakout Ethernet uplink port 1, and commits the transaction:</p> <pre>USA-A# scope eth-uplink USA-A /eth-uplink # scope vlan id USA-A /eth-uplink/vlan # enter member-aggr-port a 1 1</pre>	Commits the transaction to the server.

	Command or Action	Purpose
	<pre> USA-A /eth-uplink/vlan/member-aggr-port* # create br-member-port 4 USA-A /eth-uplink/vlan/member-aggr-port/br-member-port* # commit-buffer </pre>	

What to do next

Verify that you created the breakout VLAN Member port using the **show** command.

Modifying a Breakout Port

The following table describes how to modify the supported breakout ports.

Breakout Port Type	Scope	CLI Location From Which To Modify	Modify Options
Ethernet Uplink	eth-uplink	<pre> UCS-A /eth-uplink/fabric/agg-interface/br-interface # create </pre>	mon-src — Creates a monitor source session.
		<pre> UCS-A /eth-uplink/fabric/agg-interface/br-interface # set </pre>	eth-link-profile — Sets the Ethernet Link profile name. flow-control-policy — Sets the flow control policy that configures the receive and send flow control parameters for the LAN and Ethernet uplink ports. speed — Sets the speed for an Ethernet uplink port. user-label — Assigns an identifying label to the Ethernet Uplink port.
		<pre> UCS-A /eth-uplink/fabric/agg-interface/br-interface # </pre>	disable — Disables the aggregate interface for the Ethernet Uplink breakout port. enable — Enables the aggregate interface for the Ethernet Uplink breakout port.

Breakout Port Type	Scope	CLI Location From Which To Modify	Modify Options
Ethernet Uplink port-channel member	fc-storage	UCS-A /uplink/eth/agg-interface-fc/ethport # set	eth-link-profile — Sets the Ethernet Link profile name.
		UCS-A /uplink/eth/agg-interface-fc/ethport #	disable — Disables the aggregate interface for the breakout Ethernet Uplink port-channel member. enable — Enables the aggregate interface for the breakout Ethernet Uplink port-channel member.
FCoE Uplink	fc-uplink	UCS-A /uplink/fc/agg-interface-fcoe/ethport # create	mon-src — Creates a monitor source session.
		UCS-A /uplink/fc/agg-interface-fcoe/ethport # set	eth-link-profile — Sets the Ethernet Link profile name. user-label — Assigns an identifying label to the FCoE uplink breakout port.
		UCS-A /uplink/fc/agg-interface-fcoe/ethport #	disable — Disables the aggregate interface for the FCoE uplink breakout port. enable — Enables the aggregate interface for the FCoE uplink breakout port.
FCoE Uplink port-channel member	eth-uplink	UCS-A /uplink/fcoe/agg-interface-fcoe/ethport # set	eth-link-profile — Sets the Ethernet Link profile name.
		A /uplink/fcoe/agg-interface-fcoe/ethport #	disable — Disables the aggregate interface for the breakout FCoE uplink port-channel member. enable — Enables the aggregate interface for the breakout FCoE uplink port-channel member.

Breakout Port Type	Scope	CLI Location From Which To Modify	Modify Options
FCoE Storage port	fc-storage	UCS-A /fc-storage/fabric/aggr-interface/br-fcoe # create	mon-src — Creates a monitor source session.
		UCS-A /fc-storage/fabric/aggr-interface/br-fcoe # set	user-label — Assigns an identifying label to the server.
		UCS-A /fc-storage/fabric/aggr-interface/br-fcoe #	disable — Disables the aggregate interface for the breakout FCoE Storage port enable — Enables the aggregate interface for the breakout FCoE Storage port.

Breakout Port Type	Scope	CLI Location From Which To Modify	Modify Options
Appliance Port	eth-storage	UCS-A /eth-storage/fabric/agg-interface/interface # set	<p>adminspped— Sets the speed for a fabric interface.</p> <p>flowctrlpolicy—Sets the flow control policy that configures the receive and send flow control parameters for the appliance ports.</p> <p>nw-control-policy — Creates a network control policy for the appliance port.</p> <p>pingroupname— Sets the pin group name for the fabric interface.</p> <p>portmode— Sets the appliance port mode.</p> <p>prio — Sets the QoS (Quality of Service) priority level.</p> <p>user-label— Assigns an identifying label to the appliance port.</p>
		UCS-A /eth-storage/fabric/agg-interface/interface # create	<p>eth-target — Creates the Ethernet target endpoint.</p> <p>mon-src— Creates a monitor source session.</p>
		UCS-A /eth-storage/fabric/agg-interface/interface #	<p>disable— Disables the aggregate interface for the appliance breakout port.</p> <p>enable—Enables the aggregate interface for the appliance breakout port.</p>
Appliance port-channel member	eth-storage	UCS-A /eth-storage/port-channel/member-agg-port #	<p>disable— Disables the aggregate interface for the breakout appliance port-channel member.</p> <p>enable—Enables the aggregate interface for the breakout appliance port-channel member.</p>

Breakout Port Type	Scope	CLI Location From Which To Modify	Modify Options
VLAN Member	eth-uplink	A /eth-uplink/aggport/br- # set	isnative — Marks a member-port as a native VLAN.
Pin Group - Pin Target	eth-uplink	N/A	N/A
SPAN (Traffic Monitoring) Destination Port	eth-traffic-mon	A /eth-traffic-mon/aggport/br- # set	speed — Sets the speed for the SPAN (Traffic Monitoring) destination port.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink .	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b} .	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # scope aggr-interface port-number port-id .	Enters the interface for the specified aggregate(main) Ethernet uplink port.
Step 4	UCS-A /eth-uplink/fabric/aggr-interface # scope br-interface port-id .	Enters the breakout Ethernet port for the specified port number.
Step 5	UCS-A /eth-uplink/fabric/aggr-interface/br-interface # create mon-src . Example: The following example shows how to modify a Ethernet uplink port as a monitor source in breakout port 1 of the aggregate (main) interface in port 1 with an ID of 21. UCS-A# scope eth-uplink UCS-A /eth-uplink # scope fabric a UCS-A /eth-uplink/fabric # scope aggr-interface 1 21 UCS-A /eth-uplink/fabric/aggr-interface # scope br-interface 1 UCS-A /eth-uplink/fabric/aggr-interface/br-interface # create UCS-A /eth-uplink/fabric/aggr-interface/br-interface # create mon-src	Modifies the interface as a monitoring source.

Modifying the Breakout Ethernet Uplink Port Speed and User Label

Enabling or Disabling a Breakout Ethernet Uplink Port

```
pranspat-3gfi-A /eth-uplink/fabric/aggr-interface/br-interface # set
eth-link-profile      Ethernet Link Profile name
flow-control-policy   flow control policy
speed                 Speed
user-label            User Label

pranspat-3gfi-A /eth-uplink/fabric/aggr-interface/br-interface #
disable               Disables services
enable                Enables services
```

Un-configuring Breakout Ports

If you have a breakout on port 2 in slot 1, you can un-configure the breakout port.

Before you begin

You can use the **show port** command to list the ports for the Fabric Interconnect (FI), and select the port that you want to breakout.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# / fabric-interconnect # show port Example: The following example lists the ports. <pre>Slot Aggr Port Port Oper State Mac Role Xcvr ----- 1 0 1 Link Down 84:B8:02:CA:37:56 Network 1000base T 1 2 1 Sfp Not Present 84:B8:02:CA:37:57 Unknown N/A 1 2 2 Sfp Not Present 84:B8:02:CA:37:57 Unknown N/A 1 2 3 Sfp Not Present 84:B8:02:CA:37:57 Unknown N/A 1 2 4 Sfp Not Present 84:B8:02:CA:37:57 Unknown N/A 1 0 3 Sfp Not Present 84:B8:02:CA:37:58 Unknown N/A</pre>	Displays the ports for the Fabric Interconnect.
Step 2	UCS-A# scope cabling	Enters the cabling mode.
Step 3	UCS-A# /cabling # scope fabric {a b}	Specifies fabric a or b.
Step 4	UCS-A #/ cabling # delete breakout {1 2}	

	Command or Action	Purpose
Step 5	UCS-A /cabling/fabric/breakout* # commit .	Commits the transaction to the system configuration.

What to do next

You can use the **show port** to view the unconfigured breakout ports.

Deleting Breakout Ports

You can delete 10 Gig Ethernet breakout ports. Use the **br-interface** or **br-member-port** scopes to select breakout sub-ports 1-4. You must provide the sub-port id for this scope. For example, **scope br-interface sub_port_id** .

The example described in this topic describes how to delete a breakout Ethernet uplink port. The following table describes how to delete the supported Ethernet breakout ports.

Breakout Port Type	Scope	CLI Location From Which To Delete
Ethernet Uplink	eth-uplink	UCS-A /eth-uplink/fabric/aggr-interface # delete br-interface number
Ethernet Uplink port-channel member	eth-uplink	UCS-A /eth-uplink/fabric/port-channel/aggr-interface # delete br-member-port number
FCoE Uplink	fc-uplink	UCS-A /fc-uplink/fabric/aggr-interface # delete br-fcoeinterface number
FCoE Uplink port-channel member	eth-uplink	UCS-A /fc-uplink/fabric/fcoe-port-channel/aggr-interface # delete br-member-port number
FCoE Storage port	fc-storage	UCS-A /fc-storage/fabric/aggr-interface # delete br-interface br-fcoe number
Appliance Port	eth-storage	UCS--A /eth-storage/fabric/port-channel/member-aggr-port # delete br-member-port number
Appliance port-channel member	eth-storage	UCS-A /eth-storage/fabric/aggr-interface # delete br-interface number
VLAN Member	eth-uplink	UCS-A /eth-uplink/vlan/member-aggr-port # delete br-member-port number
Pin Group - Pin Target	eth-uplink	UCS-A /eth-uplink/pin-group # delete target number
SPAN (Traffic Monitoring) Destination Port	eth-traffic-mon	UCS-A /eth-traffic-mon/fabric/eth-mon-session/dest-aggr-interface # delete br-dest-interface

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters the Ethernet uplink mode.
Step 2	UCS-A# /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # scope port-channel number	Enters Ethernet uplink fabric port channel mode for the specified port channel.
Step 4	UCS-A /eth-uplink/fabric/port-channel/aggr-interface # delete br-member-port number	Deletes the specified breakout port.
Step 5	UCS-A /eth-uplink/fabric/port-channel/aggr-interface # commit-buffer Example: This example deletes an Ethernet Uplink port-channel member in breakout port 1 of the aggregate (main) interface port 1 slot 1. UCS-A# scope eth-uplink UCS-A /eth-uplink # scope fabric a UCS-A /eth-uplink/fabric # scope port-channel 1 UCS-A /eth-uplink/fabric/port-channel # enter aggr-interface 1 1 UCS-A /eth-uplink/fabric/port-channel/aggr-interface # delete br-member-port 1 UCS-A /eth-uplink/fabric/port-channel/aggr-interface* # commit-buffer	Commits the transaction to the server.

What to do next

Verify that you deleted the specified breakout port using the **show** command.

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. The scalability ports can be used as a licensed server port for supported Cisco UCS rack servers, an appliance port, or a 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 ports, port channel members or SPAN members on the scalability port, scope into the scalability port first, then follow the steps for a standard unified port.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-server	Enters Ethernet server mode.
Step 2	UCS-A /eth-server # scope fabric {a b}	Enters Ethernet server fabric mode for the specified fabric.
Step 3	UCS-A /eth-server/fabric # scope aggr-interface slot-num port-num	Enters ethernet server fabric aggregate interface mode for the scalability port.
Step 4	UCS-A /eth-server/fabric/aggr-interface # show interface	Displays the interfaces on the scalability port.
Step 5	UCS-A /eth-server/fabric/aggr-interface # create interface slot-num port-num	Creates an interface for the specified Ethernet server port.
Step 6	UCS-A /eth-server/fabric/aggr-interface # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to create an interface for Ethernet server port 3 on the fabric A scalability port and commit the transaction:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric a
UCS-A /eth-server/fabric # scope aggr-interface 1 5
UCS-A /eth-server/fabric/aggr-interface # show interface
Interface:

Slot Id Aggr-Port ID Port Id Admin State Oper State State Reason
-----
      1          5      1 Enabled      Up
      1          5      2 Enabled      Up
      1          5      3 Enabled  Admin Down  Administratively Down
      1          5      4 Enabled  Admin Down  Administratively Down

UCS-A /eth-server/fabric/aggr-interface # create interface 1 3
UCS-A /eth-server/fabric/aggr-interface* # commit-buffer
UCS-A /eth-server/fabric/aggr-interface #
```

Beacon LEDs for Unified Ports

Each port 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.

Configuring the Beacon LEDs for Unified Ports

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

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fabric-interconnect {a b}	Enters fabric interconnect mode for the specified fabric.
Step 2	UCS-A /fabric # scope card slot-id	Enters card mode for the specified fixed or expansion module.
Step 3	UCS-A /fabric/card # scope beacon-led	Enters beacon LED mode.
Step 4	UCS-A /fabric/card/beacon-led # set admin-state {eth fc off}	Specifies which port mode is represented by illuminated beacon LED lights. eth All of the Unified Ports configured in Ethernet mode illuminate. fc All of the Unified Ports configured in Fibre Channel mode illuminate. off Beacon LED lights for all ports on the module are turned off.
Step 5	UCS-A /fabric/card/beacon-led # commit-buffer	Commits the transaction to the system configuration.

Example

The following example illuminates all of the beacon lights for Unified Ports in Ethernet port mode and commits the transaction:

```
UCS-A# scope fabric-interconnect a
UCS-A /fabric # scope card 1
UCS-A /fabric/card # scope beacon-led
UCS-A /fabric/card/beacon-led # set admin-state eth
UCS-A /fabric/card/beacon-led* # commit-buffer
UCS-A /fabric/card/beacon-led #
```

Unified Ports on the Cisco UCS 6500 Series Fabric Interconnects

Unified ports are ports on the Cisco UCS 6500 Series Fabric Interconnects that you can configure to carry either Ethernet or Fibre Channel traffic. A Cisco UCS domain cannot use these un-reserved ports until you configure them.



Note When you configure a port on a Fabric Interconnect, the administrative state is automatically set to enabled. If the port is connected to another device, this may cause traffic disruption. You can disable the port after configuring it. Configurable beacon LEDs indicate which unified ports are configured for the selected port mode.

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

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

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

Configuring Fibre Channel Breakout Ports

Converting Ethernet Ports to Fibre Channel Breakout Port

You can follow the below steps to configure ethernet ports to Fibre Channel ports using scope cabling:

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope cabling	Enters the cabling mode.
Step 2	UCS-A /cabling # scope fabric a	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /cabling/fabric # create breakout / 36	Creates the breakout port on the selected slot and port.
Step 4	UCS-A /cabling/fabric/breakout* # set transport fc	Creates Fibre Channel uplink breakout ports.
Step 5	UCS-A /cabling/fabric/breakout* # commit-buffer	Commits the transaction to the server.

Example

The following example creates breakout ports on a UCS 6536 Fabric Interconnect, sets the breakout type, and commits the transaction:

```
UCS-A# scope cabling
UCS-A /cabling # scope fabric a
UCS-A /cabling/fabric/breakout* # create breakout 1 36
UCS-A /cabling/fabric/breakout* # set transport fc
```



Note This operation will change port mode from Ethernet to Fibre Channel or vice-versa. When committed, this change will require the switch to reboot.

```
UCS-A /cabling/fabric/breakout* # commit-buffer
```

Converting Ethernet Breakout Port to Fibre Channel Breakout Port

Follow the below commands to convert any existing ethernet breakout ports to Fibre Channel breakout ports using scope cabling:

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope cabling	Enters the cabling mode.
Step 2	UCS-A /cabling # scope fabric a	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /cabling/fabric # show breakout	Shows the existing breakout ports.
Step 4	UCS-A /fc-uplink/fabric # scope breakout 1 36	Enters the breakout port.
Step 5	UCS-A /fc-uplink/fabric/breakout # set transport fc	Creates the FC uplink breakout ports.
Step 6	UCS-A /cabling/fabric/breakout* # commit-buffer	Commits the transaction to the server.

Example

The following example creates breakout ports on a UCS 6536 Fabric Interconnect, sets the breakout type, and commits the transaction:

```
UCS-A# scope cabling
UCS-A /cabling # scope fabric a
UCS-A /fc-uplink/fabric # show breakout
port breakout:
  Slot ID   Port ID   breakout type FC breakout type transport type
  -----
           1       36       10g 4x           Unknown           Ether
```

```
UCS-A /cabling/fabric # scope breakout 1 36
UCS-A /fc-uplink/fabric/breakout # set transport fc
```



Note This operation will change port mode from Ethernet to Fibre Channel or vice-versa. When committed, this change will require the switch to reboot.

```
UCS-A /cabling/fabric/breakout* # commit-buffer
```

Converting Ethernet Breakout Port to Fibre Channel Breakout Port Using Fibre Channel Uplink

To create ethernet breakout port through Fibre Channel Uplink, the port should already be in ethernet breakout mode.

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope fc-uplink	Enters the Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric a	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # create aggr-interface slot-id port-id	Creates the breakout port on the selected slot and port. The Slot ID ranges from 1 through 4 and the Port ID ranges from 36 through 33.
Step 4	UCS-A /fc-uplink/fabric/aggr-interface* # create br-interface slot-id	Creates the breakout port on the selected port.
Step 5	UCS-A /fc-uplink/fabric/aggr-interface/br-interface* # up	Sets the breakout port on the selected slot and port as FC uplink port.
Step 6	Repeat steps 4 and 5 for the remaining <i>slot-id</i> from 1 through 4.	
Step 7	UCS-A /fc-uplink/fabric/aggr-interface/br-interface*# commit-buffer	Commits the transaction to the server.

Example

The following example creates breakout ports on a UCS 6536 Fabric Interconnect, sets the breakout type, and commits the transaction:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # create aggr-interface 1 36
UCS-A /fc-uplink/fabric/aggr-interface* # create br-interface 1
UCS-A /fc-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /fc-uplink/fabric/aggr-interface* # create br-interface 2
UCS-A /fc-uplink/fabric/aggr-interface/br-interface* # up
```

```
UCS-A /fc-uplink/fabric/aggr-interface* # create br-interface 3
UCS-A /fc-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /fc-uplink/fabric/aggr-interface* # create br-interface 4
UCS-A /fc-uplink/fabric/aggr-interface/br-interface* # up
UCS-A /fc-uplink/fabric/aggr-interface/br-interface* # commit-buffer
```



Note You must create all four breakout interfaces to proceed with **commit-buffer**.

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.

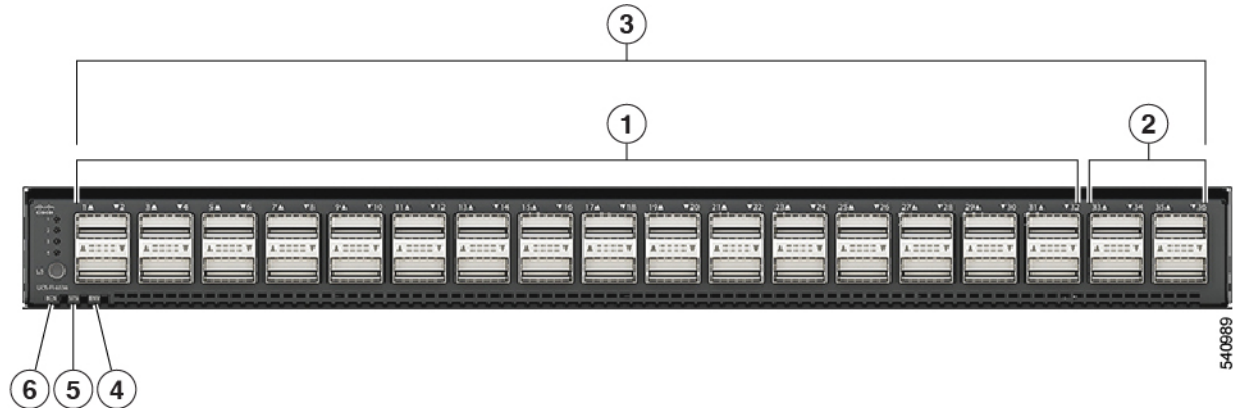
The following image shows the rear view of the Cisco UCS 6536 fabric interconnect:

Figure 6: 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 7: Cisco UCS 6536 Fabric Interconnect Rear View



1	Ports 1-32. Uplink ports are Ethernet port that 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.	2	Ports 33-36. Unified Ports can operate with port speed of 10 Gbps/25 Gbps/ 40 Gbps/100 Gbps Ethernet. or 8 Gbps/16 Gbps/32 Gbps Fibre Channel (FC). 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.
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.

Deleting Fibre Channel Breakout Port

Deleting Fibre Channel Breakout Ports

The example described in this topic describes how to delete an entire breakout interface and to convert the port to normal ethernet interface using scope cabling.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope cabling	Enters the cabling mode.
Step 2	UCS-A# /cabling # scope fabric {a b}	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /cabling/fabric # delete breakout <i>slot-id port-id</i>	Deletes the breakout for the specified ports. Slot ID ranges from 1 through 4 and Port ID ranges from 33 through 36. Note This operation will change the port mode (from Ethernet to FC or vice-versa). When committed, it leads to reboot.
Step 4	UCS-A /cabling/fabric* # commit-buffer	Commits the transaction to the server.

What to do next

Verify that you deleted the specified breakout port using the **show** command.

Deleting Fibre Channel Breakout Ports Using Fibre Channel Uplink

You can follow the below steps to delete an entire breakout interface and to convert the port to normal ethernet interface.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters the cabling mode.
Step 2	UCS-A# /fc-uplink # scope fabric {a b}	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # delete aggr-interface slot-id port-id	Deletes the breakout for the specified ports. Slot ID ranges from 1 through 4 and Port ID ranges from 33 through 36. Note This operation will change the port mode (from Ethernet to FC or vice-versa). When committed, it leads to reboot.
Step 4	UCS-A /fc-uplink/fabric* # commit-buffer	Commits the transaction to the server.

What to do next

Verify that you deleted the specified breakout port using the **show** command.

Appliance Breakout Port**Configuring Breakout Appliance Ports**

You can follow the below steps to configure appliance breakout ports for both Cisco UCS 6400 Series Fabric Interconnect and Cisco UCS 6500 Series Fabric Interconnect:

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A# /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A# /eth-storage/fabric # enter aggr-interface slot-numaggregate-port-num	Enters the interface for the specified aggregate(main) appliance port.

	Command or Action	Purpose
Step 4	UCS-A# /eth-storage/fabric/port-channel/member-aggr-port # create br -interface <i>breakout-port-num</i>	Creates an interface for the specified breakout appliance port.
Step 5	UCS-A# /eth-storage/fabric/port-channel/member-aggr-port/member-port # commit-buffer Example: The following example creates an interface for an appliance port 1 of the aggregate port 20 on slot 1 of fabric B, and commits the transaction: UCS-A# scope eth-storage UCS-A /eth-storage # scope fabric a UCS-A /eth-storage/fabric # enter aggr-interface 1 20 UCS-A /eth-storage/fabric/aggr-interface # create br-interface 1 UCS-A /eth-storage/fabric/aggr-interface/br-interface* # commit-buffer Example: Note If the port is only connected to 100G SFP which is broken out in 25x4 breakout port then when creating an appliance port, the default speed for a breakout port would be Auto .	Commits the transaction to the server.

Modifying Speed for Breakout Port of Type 25x4Gbps

Beginning from Cisco UCS Manager release 4.2(3b), you can modify the speed for breakout port of type 25x4Gbps for both Cisco UCS 6400 and Cisco UCS 6500 Series Fabric Interconnects. The commands are:

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A# /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A# /eth-storage/fabric /aggr-interface # create aggr-interface 1 28	Enters the interface for the specified aggregate(main) appliance port.

	Command or Action	Purpose
Step 4	UCS-A# /eth-storage/fabric/aggr-interface # scope br -interface l	Creates an interface for the specified breakout appliance port.
Step 5	UCS-A# /eth-storage/fabric/aggr-interface/br-interface* # set adminspeed 25gbps	Modifies the admin speed to 25Gbps.
Step 6	UCS-A# /eth-storage/fabric/aggr-interface/br-interface* # commit-buffer	Commits the transaction.

Modifying FEC Value for Breakout Port of Type 25 x 4Gbps

From Release 4.2(3i) onwards, you can modify the FEC value for breakout port of type 25 x 4Gbps. The commands are:

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A# /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A# /eth-storage/fabric /aggr-interface # create aggr-interface l 28	Enters the interface for the specified aggregate(main) appliance port.
Step 4	UCS-A# /eth-storage/fabric/aggr-interface # scope br -interface l	Creates an interface for the specified breakout appliance port.
Step 5	UCS-A# /eth-storage/fabric/aggr-interface/br-interface* # set fec cl91	Modifies the FEC value to cl91.
Step 6	UCS-A# /eth-storage/fabric/aggr-interface/br-interface* # commit-buffer	Commits the transaction to the server. Note You cannot modify FEC value for any other port which is not a 25x4 breakout port. If you modify the speed of a breakout port other than 25x4, it will revert to Auto .

Unified Breakout Storage Ports

Converting Fibre Channel Uplink Port to Fibre Channel Storage Port

Follow the below commands to convert Fibre Channel Uplink port to Fibre Channel Storage port using scope cabling:

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope fc-storage	Enters the Fibre Channel storage mode.
Step 2	UCS-A /fc-storage # scope fabric a	Enters cabling fabric mode for the specified fabric.
Step 3	UCS-A /fc-storage/fabric # create aggr-interface 1 36	Creates the breakout port on the specified aggregate (main) FC storage port.
Step 4	UCS-A /fc-storage/fabric/aggr-interface* # create br-interface br-fc 1	Creates the breakout port on the selected port.
Step 5	UCS-A /fc-storage/fabric/aggr-interface/br-fc* # commit-buffer	Commits the transaction to the server.
Step 6	UCS-A /fc-storage/fabric/aggr-interface/br-fc # up	
Step 7	UCS-A /fc-storage/fabric/aggr-interface # up	
Step 8	UCS-A /fc-storage/fabric # show interface fc	Displays the output.

Example

Breakout FC Interface:

```

Slot ID   Aggr-Port ID Port ID   Admin State Speed           Config State Operational State
State Reason   Lic State           Grace Prd
-----
          1           36 1       Enabled    16gbps           Inconsistent Sfp Not Present
FC storage interface unsupported in FC end host mode

                Not Applicable           0
UCS-A /fc-storage/fabric # scope aggr-interface 1 36
UCS-A /fc-storage/fabric/aggr-interface # show br-interface br-fc

```

Breakout FC Interface:

```

Slot ID   Aggr-Port ID Port ID   Admin State Speed           Config State Operational
State State Reason Lic State           Grace Prd
-----
          1           36 1       Enabled    16gbps           Inconsistent Sfp Not Present
FC storage interface unsupported in FC end host mode

                Not Applicable           0
UCS-A /fc-storage/fabric/aggr-interface #

```

Fibre Channel Uplink Breakout Port Channels

Configuring Fibre Channel Uplink Breakout Port Channel and Member Addition

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric a	Enters Fibre Channel uplink fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # create port-channel 100	Creates a port channel on the specified Fibre Channel uplink port, and enters Fibre Channel uplink fabric port channel mode.
Step 4	UCS-A /fc-uplink/fabric/port channel* # create aggr-interface 1 36	Creates the interface for the specified aggregate (main) Fibre Channel uplink port.
Step 5	UCS-A /fc-uplink/fabric/port channel/aggr-interface* # create br-member-port 2	Creates the member port for the specified breakout Fibre Channel uplink port.
Step 6	UCS-A /fc-uplink/fabric/port channel/aggr-interface/br-member-port* # commit-buffer	Commits the transaction to the system configuration.
Step 7	UCS-A /fc-uplink/fabric/port channel/aggr-interface/br-member-port # up	
Step 8	UCS-A /fc-uplink/fabric/port channel/aggr-interface/br-member-port # show br-member-port	Displays the output.

Example

The following is the example for creating and adding a member to a breakout port channel:

Breakout Fc Member Port:

```

Slot Id   Aggr-Port ID  Port Id   Membership      Admin State  User Label  Oper State
      Speed          Oper Speed  State Reason Lic State          Grace Perio
-----
d          Fill Pattern
-----
-----
          1 36          2          Down          Enabled          Sfp Not Present
Auto          Indeterminate SFP not present Not Applicable
          0 Idle
UCS-A /fc-uplink/fabric/port-channel/aggr-interface # up
UCS-A /fc-uplink/fabric/port-channel # show aggr-interface

```

Aggregate-Interface:

```

Slot      Port          Config State Lic State Grace Prd
-----

```

```

1 36          Disabled      Unknown    0
UCS-A /fc-uplink/fabric/port-channel # up
UCS-A /fc-uplink/fabric # show interface

```

Breakout Interface:

Slot Id	Aggr-Port ID	Port Id	Admin State	Oper State	Fill Pattern	State Reason
Speed	Oper Speed	Lic State	Grace Prd			
1 34	1	Disabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			
1 34	2	Disabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			
1 34	3	Disabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			
1 34	4	Enabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			
1 35	1	Enabled	Sfp Not Present	Idle	SFP not	
present 32gbps	Indeterminate	Not Applicable	0			
1 35	2	Enabled	Sfp Not Present	Idle	SFP not	
present 32gbps	Indeterminate	Not Applicable	0			
1 35	3	Enabled	Sfp Not Present	Idle	SFP not	
present 32gbps	Indeterminate	Not Applicable	0			
1 35	4	Enabled	Sfp Not Present	Idle	SFP not	
present 32gbps	Indeterminate	Not Applicable	0			
1 36	1	Disabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			
1 36	3	Enabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			
1 36	4	Enabled	Sfp Not Present	Idle	SFP not	
present 16gbps	Indeterminate	Not Applicable	0			

Breakout Fc Member Port:

Port-channel	Slot	AggregatePort	Port	Oper State	State Reason
100	1 36		2	Sfp Not Present	SFP not present

UCS-A /fc-uplink/fabric #

Physical and Backplane Ports

Displaying VIF Port Statistics Obtained From the Adaptor

Procedure

	Command or Action	Purpose
Step 1	UCS-A /fabric-interconnect # connect nxos {a b}	Enters NX-OS mode for the fabric interconnect.
Step 2	UCS-A(nxos)# show interface vethernet veth-id counters	Displays VIF port statistics that are obtained from the adaptor.

Example

The following example shows how to display VIF port statistics that are obtained from the adaptor:

```
UCS-A /fabric-interconnect # connect nxos a
UCS-A(nxos) # show interface vethernet 684 counters
```

```
-----
Port                               InOctets                               InUcastPkts
-----
Veth684                             0                                       0
```

```
-----
Port                               InMcastPkts                             InBcastPkts
-----
Veth684                               0                                       0
```

```
-----
Port                               OutOctets                                OutUcastPkts
-----
Veth684                               0                                       0
```

```
-----
Port                               OutMcastPkts                             OutBcastPkts
-----
Veth684                               0                                       0
```

Displaying VIF Port Statistics Obtained From the ASIC

Procedure

	Command or Action	Purpose
Step 1	UCS-A /fabric-interconnect # connect nxos {a b}	Enters NX-OS mode for the fabric interconnect.
Step 2	UCS-A(nxos) # show platform fwm info lif vethernet veth-id grep frame	Displays VIF-port RX and TX frame statistics obtained from the ASIC. RX statistics are for all type of frames. Tx statistics are only for known unicast frames.

Example

The following example shows how to display VIF-port RX and TX frame statistics obtained from the ASIC:

```
UCS-A /fabric-interconnect # connect nxos a
UCS-A(nxos) # show platform fwm info lif vethernet 684 | grep frame
```

```
vif29 pd: rx frames: 0 tx frames: 0;
UCS-A(nxos)#
```

Displaying VIF Ports That Correspond to NIV Ports

Procedure

	Command or Action	Purpose
Step 1	UCS-A /fabric-interconnect # connect nxos {a b}	Enters NX-OS mode for the fabric interconnect.
Step 2	UCS-A(nxos)# show platform fwm info lif vethernet veth-id grep niv	Displays VIF ports that correspond to NIV ports.

Example

The following example shows how to display VIF ports that correspond to NIV ports:

```
UCS-A /fabric-interconnect # connect nxos a
UCS-A(nxos)# show platform fwm info lif vethernet 741 | grep niv

vif20 pd: niv_port_id 0x7000001f (the 0x1F or "31" is the Source/Dest-VP index)
```

Verifying Status of Backplane Ports

Procedure

	Command or Action	Purpose
Step 1	UCS-A /fabric-interconnect # connect nxos {a b}	Enters NX-OS mode for the fabric interconnect.
Step 2	UCS-A(nxos)# show interface br	Displays the configuration of the interface, including the speed and status of the backplane ports.

Example

The following example shows how to verify the status of backplane ports for fabric interconnect A:

```
UCS-A /fabric-interconnect # connect nxos a
UCS-A(nxos) # show interface br
```

Ethernet Interface	VLAN	Type	Mode	Status	Reason	Speed	Port Ch #
Eth1/1	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/2	1	eth	access	down	SFP not inserted	40G (D)	--
Br-Eth1/3/1	1	eth	access	down	Administratively down	10G (D)	--
Br-Eth1/3/2	1	eth	access	down	Administratively down	10G (D)	--
Br-Eth1/3/3	1	eth	access	down	Administratively down	10G (D)	--
Br-Eth1/3/4	1	eth	access	down	Administratively down	10G (D)	--
Eth1/4	1	eth	access	down	SFP not inserted	40G (D)	--
Br-Eth1/5/1	4044	eth	trunk	down	Link not connected	10G (D)	--
Br-Eth1/5/2	4044	eth	trunk	down	Link not connected	10G (D)	--
Br-Eth1/5/3	4044	eth	trunk	down	Link not connected	10G (D)	--
Br-Eth1/5/4	4044	eth	trunk	down	Link not connected	10G (D)	--
Eth1/6	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/7	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/8	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/9	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/10	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/11	1	eth	fabric	up	none	40G (D)	--
Eth1/12	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/13	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/14	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/15	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/16	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/17	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/18	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/19	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/20	1	eth	access	down	SFP not inserted	40G (D)	--
Br-Eth1/21/1	1	eth	trunk	up	none	10G (D)	--
Br-Eth1/21/2	1	eth	trunk	up	none	10G (D)	--
Br-Eth1/21/3	1	eth	trunk	down	Link not connected	10G (D)	--
Br-Eth1/21/4	1	eth	trunk	up	none	10G (D)	--
Eth1/22	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/23	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/24	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/25	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/26	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/27	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/28	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/29	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/30	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/31	1	eth	access	down	SFP not inserted	40G (D)	--
Eth1/32	1	eth	access	down	SFP not inserted	40G (D)	--

Port-channel Interface	VLAN	Type	Mode	Status	Reason	Speed	Protocol
Pol285	1	eth	vntag	up	none	a-10G (D)	none
Pol286	1	eth	vntag	up	none	a-10G (D)	none
Pol287	1	eth	vntag	up	none	a-10G (D)	none
Pol288	1	eth	vntag	up	none	a-10G (D)	none
Pol289	1	eth	vntag	up	none	a-10G (D)	none

Port	VRF	Status	IP Address	Speed	MTU
------	-----	--------	------------	-------	-----

Verifying Status of Backplane Ports

```
mgmt0  --                down  10.197.157.252                --                1500
```

```
-----
Vethernet      VLAN  Type Mode  Status Reason              Speed
-----
Veth691        4047 virt trunk down  nonParticipating   auto
Veth692        4047 virt trunk up    none                auto
Veth693         1    virt trunk down  nonParticipating   auto
Veth695         1    virt trunk up    none                auto
Veth699         1    virt trunk up    none                auto
-----
```

```
-----
Interface      Secondary VLAN(Type)              Status Reason
-----
Vlan1          --                                down  Administratively down
-----
```

```
-----
Ethernet      VLAN  Type Mode  Status Reason              Speed  Port
Interface                                           Ch #
-----
Eth1/1/1      1    eth  vntag up    none                10G(D) 1286
Eth1/1/2      1    eth  access down  Administratively down 10G(D) --
Eth1/1/3      1    eth  vntag up    none                10G(D) 1286
Eth1/1/4      1    eth  access down  Administratively down 10G(D) --
Eth1/1/5      1    eth  vntag up    none                10G(D) 1287
Eth1/1/6      1    eth  access down  Administratively down 10G(D) --
Eth1/1/7      1    eth  vntag up    none                10G(D) 1287
Eth1/1/8      1    eth  access down  Administratively down 10G(D) --
Eth1/1/9      1    eth  vntag up    none                10G(D) 1289
Eth1/1/10     1    eth  access down  Administratively down 10G(D) --
Eth1/1/11     1    eth  vntag up    none                10G(D) 1289
Eth1/1/12     1    eth  access down  Administratively down 10G(D) --
Eth1/1/13     1    eth  vntag up    none                10G(D) 1285
Eth1/1/14     1    eth  access down  Administratively down 10G(D) --
Eth1/1/15     1    eth  vntag up    none                10G(D) 1285
Eth1/1/16     1    eth  access down  Administratively down 10G(D) --
Eth1/1/17     1    eth  access down  Administratively down 10G(D) --
Eth1/1/18     1    eth  vntag up    none                10G(D) 1288
Eth1/1/19     1    eth  access down  Administratively down 10G(D) --
Eth1/1/20     1    eth  vntag up    none                10G(D) 1288
Eth1/1/21     1    eth  access down  Administratively down 10G(D) --
Eth1/1/22     1    eth  access down  Administratively down 10G(D) --
Eth1/1/23     1    eth  access down  Administratively down 10G(D) --
Eth1/1/24     1    eth  access down  Administratively down 10G(D) --
Eth1/1/25     1    eth  access down  Administratively down 10G(D) --
Eth1/1/26     1    eth  access down  Administratively down 10G(D) --
Eth1/1/27     1    eth  access down  Administratively down 10G(D) --
Eth1/1/28     1    eth  access down  Administratively down 10G(D) --
Eth1/1/29     1    eth  access down  Administratively down 10G(D) --
Eth1/1/30     1    eth  access down  Administratively down 10G(D) --
Eth1/1/31     1    eth  access down  Administratively down 10G(D) --
Eth1/1/32     1    eth  access down  Administratively down 10G(D) --
Eth1/1/33     4044 eth  trunk up    none                1000(D) --
-----
```


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** UCS-A# **scope org/**
Enters the root organization mode.
- Step 2** UCS-A / org# **scope por**
Enters organization port discovery policy mode.
- Step 3** UCS-A / org / port-disc-policy# **set descr**
Provides a description for the port discovery policy.
- Step 4** UCS-A / org / port-disc-policy# **set server-auto-disc**
Enables port auto-discovery.

Note By default `server-auto-disc` is disabled. Port auto-discovery is triggered by enabling `server-auto-disc`.

Example

The following example shows how to enable automatic configuration of fabric interconnect server ports:

```
UCS-A# scope org/
UCS-A /org# scope por
UCS-A / org / port-disc-policy # set descr
UCS-A / org / port-disc-policy # set server-auto-disc
```

Configuring a Server Port

All of the port types listed are configurable on both the fixed and expansion module, including server ports, which are not configurable on the 6100 series fabric interconnect expansion module, but are configurable on the 6200 series fabric interconnect expansion module.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-server	Enters Ethernet server mode.
Step 2	UCS-A /eth-server # scope fabric {a b}	Enters Ethernet server fabric mode for the specified fabric.
Step 3	UCS-A /eth-server/fabric # create interface slot-num port-num	Creates an interface for the specified Ethernet server port.
Step 4	UCS-A /eth-server/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to create an interface for Ethernet server port 4 on slot 1 of fabric B and commit the transaction:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric b
UCS-A /eth-server/fabric # create interface 1 4
UCS-A /eth-server/fabric* # commit-buffer
UCS-A /eth-server/fabric #
```

Unconfiguring a Server Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-server	Enters Ethernet server mode.
Step 2	UCS-A /eth-server # scope fabric {a b}	Enters Ethernet server fabric mode for the specified fabric.
Step 3	UCS-A /eth-server/fabric # delete interface slot-num port-num	Deletes the interface for the specified Ethernet server port.

	Command or Action	Purpose
Step 4	UCS-A /eth-server/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example unconfigures Ethernet server port 12 on slot 1 of fabric B and commits the transaction:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric b
UCS-A /eth-server/fabric # delete interface 1 12
UCS-A /eth-server/fabric* # commit-buffer
UCS-A /eth-server/fabric #
```

Configuring a Server Port for Forward Error Correction

The N9K-C93180YC-FX3 in FEX mode connects to 25Gps or 100 Gps server port on the Cisco UCS 6400 series Fabric Interconnects and Cisco UCS 6500 series Fabric Interconnects. To have the link-up at 25Gps, 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 and Cisco UCS 6500 series Fabric Interconnects.



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

Table 1: 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

	Command or Action	Purpose
Step 1	UCS-A# scope eth-server	Enters Server mode.

	Command or Action	Purpose
Step 2	UCS-A /eth-server # scope fabric {a b}	Enters Server mode for the specified fabric.
Step 3	UCS-A /eth-server/fabric/interface # scope interface slot-id port-id	Enters Server interface mode for the specified interface.
Step 4	UCS-A /eth-server/fabric/interface # set fec {auto c174}	Sets the forward error correction setting as auto or c174 for the server port.
Step 5	UCS-A /eth-server/fabric/interface # set auto-neg {enabled disabled}	Sets the auto negotiate as enabled or disabled for the server port.
Step 6	UCS-A /eth-server/fabric/interface # commit-buffer	Commits the transaction to the system configuration. Note Following are the mandatory configuration parameters on the server port for connecting to N9K-C93180YC-FX3: <ul style="list-style-type: none"> • The FEC must be auto for 100Gps server port. • The FEC must be c174 for 25Gps server port. • The auto-negotiation must be disabled for 100Gps server port.

Example

Example 1: The following example shows how to enable forward error correction c174 with auto-negotiation enabled, on an interface for the 25Gps server port 15 on slot 2 of fabric A, and commit the transaction:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric a
UCS-A /eth-server/fabric # scope interface 2 15
UCS-A /eth-server/fabric # set fec c174
UCS-A /eth-server/fabric/interface # set auto-neg enabled
UCS-A /eth-server/fabric* # commit-buffer
UCS-A /eth-server/fabric #
```

Example 2: The following example shows how to enable forward error correction auto with auto-negotiation disabled, on an interface for the 100 Gps server port 17 on slot 1 of fabric A, and commit the transaction:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric a
UCS-A /eth-server/fabric # scope interface 1 17
UCS-A /eth-server/fabric # set fec auto
UCS-A /eth-server/fabric/interface # set auto-neg disabled
UCS-A /eth-server/fabric* # commit-buffer
UCS-A /eth-server/fabric #
```

Uplink Ethernet Ports

Configuring an Uplink Ethernet Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric a b	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # create interface slot-num port-num	Creates an interface for the specified Ethernet uplink port.
Step 4	(Optional) UCS-A /eth-uplink/fabric # set speed {10gbps 1gbps}	Sets the speed for the specified Ethernet uplink port.
Step 5	UCS-A /eth-uplink/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to create an interface for Ethernet uplink port 3 on slot 2 of fabric B, set the speed to 10 gbps, and commit the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric b
UCS-A /eth-uplink/fabric # create interface 2 3
UCS-A /eth-uplink/fabric # set speed 10gbps
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

Unconfiguring an Uplink Ethernet Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # delete interface slot-num port-num	Deletes the interface for the specified Ethernet uplink port.

	Command or Action	Purpose
Step 4	UCS-A /eth-uplink/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example unconfigures Ethernet uplink port 3 on slot 2 of fabric B and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric b
UCS-A /eth-uplink/fabric # delete interface 2 3
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

Configuring an Uplink 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 that support this feature.

Table 2: 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
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric a b	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # scope interface slot-id port-id	Enters Ethernet interface mode for the specified interface.
Step 4	Required: UCS-A /eth-uplink/fabric # set fec {auto cl74 cl91}	Sets the forward error correction setting as auto, cl74, or cl91 for the Ethernet uplink port. For

	Command or Action	Purpose
		the UCS 6454 Fabric Interconnect, forward error correction is only configurable for 25 Gbps or 100 Gbps port speeds.
Step 5	UCS-A /eth-uplink/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to enable forward error correction c174 on an interface for Ethernet uplink port 35 on slot 1 of fabric A, and commit the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # scope interface 1 35
UCS-A /eth-uplink/fabric # set fec c174
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

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 for Cisco UCS 6400 Series Fabric Interconnect and Cisco UCS 6536 Fabric Interconnect.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # set q-in-q-forwarding enabled	Enables Q-in-Q forwarding for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to enable Q-in-Q forwarding and commit the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # set q-in-q-forwarding enabled
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

Unconfiguring Q-in-Q Forwarding

You can unconfigure Q-in-Q forwarding for Cisco UCS 6400 Series Fabric Interconnect and Cisco UCS 6536 Fabric Interconnect.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # set q-in-q-forwarding disabled	Disables Q-in-Q forwarding for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to disable Q-in-Q forwarding and commit the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # set q-in-q-forwarding disabled
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

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

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # create interface slot-num port-num	Creates an interface for the specified appliance port.
Step 4	(Optional) UCS-A /eth-storage/fabric/interface # set portmode {access trunk}	<p>Specifies whether the port mode is access or trunk. By default, the mode is set to trunk.</p> <p>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.</p>
Step 5	(Optional) UCS-A /eth-storage/fabric/interface # set pingroupname pin-group name	Specifies the appliance pin target to the specified fabric and port, or fabric and port channel.
Step 6	(Optional) UCS-A /eth-storage/fabric/interface # set prio sys-class-name	<p>Specifies the QoS class for the appliance port. By default, the priority is set to best-effort.</p> <p>The sys-class-name argument can be one of the following class keywords:</p> <ul style="list-style-type: none"> • FC—Use this priority for QoS policies that control vHBA traffic only. • Platinum—Use this priority for QoS policies that control vNIC traffic only. • Gold—Use this priority for QoS policies that control vNIC traffic only. • Silver—Use this priority for QoS policies that control vNIC traffic only. • Bronze—Use this priority for QoS policies that control vNIC traffic only.

	Command or Action	Purpose
		<ul style="list-style-type: none"> • Best Effort—Do not use this priority. It is reserved for the Basic Ethernet traffic lane. If you assign this priority to a QoS policy and configure another system class as CoS 0, Cisco UCS Manager does not default to this system class. It defaults to the priority with CoS 0 for that traffic.
Step 7	(Optional) UCS-A /eth-storage/fabric/interface # set adminspeed {10gbps 1 gbps}	Specifies the admin speed for the interface. By default, the admin speed is set to 10gbps.
Step 8	UCS-A /eth-storage/fabric/interface # commit buffer	Commits the transaction to the system configuration.

Example

The following example creates an interface for an appliance port 2 on slot 3 of fabric B, sets the port mode to access, pins the appliance port to a pin group called pingroup1, sets the QoS class to fc, sets the admin speed to 10 gbps, and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric b
UCS-A /eth-storage/fabric # create interface 3 2
UCS-A /eth-storage/fabric* # set portmode access
UCS-A /eth-storage/fabric* # set pingroupname pingroup1
UCS-A /eth-storage/fabric* # set prio fc
UCS-A /eth-storage/fabric* # set adminspeed 10gbps
UCS-A /eth-storage/fabric* # commit-buffer
UCS-A /eth-storage/fabric #
```

What to do next

Assign a VLAN or target MAC address for the appliance port.

Assigning a Target MAC Address to an Appliance Port or Appliance Port Channel

The following procedure assigns a target MAC address to an appliance port. To assign a target MAC address to an appliance port channel, scope to the port channel instead of the interface.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.

	Command or Action	Purpose
Step 3	UCS-A /eth-storage/fabric # scope interface <i>slot-id port-id</i>	Enters Ethernet interface mode for the specified interface. Note To assign a target MAC address to an appliance port channel, use the scope port-channel interface command instead of scope interface .
Step 4	UCS-A /eth-storage/fabric/interface # create eth-target <i>eth-target name</i>	Specifies the name for the specified MAC address target.
Step 5	UCS-A /eth-storage/fabric/interface/eth-target # set mac-address <i>mac-address</i>	Specifies the MAC address in nn:nn:nn:nn:nn:nn format.

Example

The following example assigns a target MAC address for an appliance device on port 3, slot 2 of fabric B and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage* # scope fabric b
UCS-A /eth-storage/fabric* # scope interface 2 3
UCS-A /eth-storage/fabric/interface* # create eth-target macname
UCS-A /eth-storage/fabric/interface* # set mac-address 01:23:45:67:89:ab
UCS-A /eth-storage/fabric/interface* # commit-buffer
UCS-A /eth-storage/fabric #
```

The following example assigns a target MAC address for appliance devices on port channel 13 of fabric B and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage* # scope fabric b
UCS-A /eth-storage/fabric* # scope port-channel 13
UCS-A /eth-storage/fabric/port-channel* # create eth-target macname
UCS-A /eth-storage/fabric/port-channel* # set mac-address 01:23:45:67:89:ab
UCS-A /eth-storage/fabric/port-channel* # commit-buffer
UCS-A /eth-storage/fabric #
```

Creating an Appliance Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A/eth-storage# create vlan <i>vlan-name</i> <i>vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet storage VLAN mode.
Step 3	UCS-A/eth-storage/vlan# set sharing primary	Saves the changes.

	Command or Action	Purpose
Step 4	UCS-A/eth-storage/vlan# commit buffer	Commits the transaction to the system configuration.
Step 5	UCS-A/eth-storage# create vlan <i>vlan-name</i> <i>vlan-id</i>	Creates a named VLAN, specifies the VLAN name and VLAN ID, and enters Ethernet storage VLAN mode .
Step 6	UCS-A/eth-storage/vlan# set sharing community	Associates the primary VLAN to the secondary VLAN that you are creating.
Step 7	UCS-A/eth-storage/vlan# set pubnwnname <i>primary vlan-name</i>	Specifies the primary VLAN to be associated with this secondary VLAN.
Step 8	UCS-A/eth-storage/vlan# commit buffer	Commits the transaction to the system configuration.

Example

The following example creates an appliance port:

```
UCS-A# scope eth-storage
UCS-A/eth-storage# create vlan PRI600 600
UCS-A/eth-storage/vlan* # set sharing primary
UCS-A/eth-storage/vlan* # commit-buffer
UCS-A/eth-storage # create vlan COM602 602
UCS-A/eth-storage/vlan* # set sharing isolated
UCS-A/eth-storage/vlan* # set pubnwnname PRI600
UCS-A/eth-storage/vlan* # commit-buffer
```

Mapping an Appliance Port to a Community VLAN

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A/eth-storage# scope fabric { <i>a</i> <i>b</i> }	Enters Ethernet storage fabric interconnect mode for the specified fabric interconnect.
Step 3	UCS-A/eth-storage/fabric# create interface <i>slot-num port-num</i>	Creates an interface for the specified Ethernet server port.
Step 4	UCS-A/eth-storage/fabric/interface# exit	Exits from the interface. Note Ensure you commit the transaction after associating with the VLAN.
Step 5	UCS-A/eth-storage/fabric# exit	Exits from the fabric.
Step 6	UCS-A/eth-storage# scope vlan <i>vlan-name</i>	Enters the specified VLAN.

	Command or Action	Purpose
		Note Ensure community VLAN is created in the appliance cloud.
Step 7	UCS-A/eth-storage/vlan# create member-port <i>fabric slot-num port-num</i>	Creates the member port for the specified fabric, assigns the slot number, and port number and enters member port configuration.
Step 8	UCS-A/eth-storage/vlan/member-port# commit	Commits the transaction to the system configuration.

Example

The following example maps an appliance port to an community VLAN:

```
UCS-A# scope eth-storage
UCS-A/eth-storage# scope fabric a
UCS-A/eth-storage/fabric# create interface 1 22
UCS-A/eth-storage/fabric/interface*# exit
UCS-A/eth-storage/fabric*# exit
UCS-A/eth-storage*# scope vlan COM602
UCS-A/eth-storage/vlan*# create member-port a 1 22
UCS-A/eth-storage/vlan/member-port* commit
```

Unconfiguring an Appliance Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # delete eth-interface <i>slot-num port-num</i>	Deletes the interface for the specified appliance port.
Step 4	UCS-A /eth-storage/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example unconfigures appliance port 3 on slot 2 of fabric B and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric b
UCS-A /eth-storage/fabric # delete eth-interface 2 3
UCS-A /eth-storage/fabric* # commit-buffer
UCS-A /eth-storage/fabric #
```

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 3: 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**.
-

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 a FCoE Uplink Port

All of the port types listed are configurable on both the fixed and expansion module, including server ports, which are not configurable on the 6100 series fabric interconnect expansion module, but are configurable on the 6200 series fabric interconnect expansion module.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FC Uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters FC - Uplink mode for the specific fabric.
Step 3	UCS-A /fc-uplink/fabric # create fcoeinterface slot-numberport-number	Creates interface for the specified FCoE uplink port.
Step 4	UCS-A /fc-uplink/fabric/fabricinterface # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates an interface for FCoE uplink port 8 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 # create fcoeinterface 1 8
UCS-A /fc-uplink/fabric/fcoeinterface* # commit-buffer
UCS-A /fc-uplink/fabric/fcoeinterface #
```

Unconfiguring a FCoE Uplink Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FC Uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters FC - Uplink mode for the specific fabric.
Step 3	UCS-A /fc-uplink/fabric # delete fcoeinterface slot-numberport-number	Deletes the specified interface.

	Command or Action	Purpose
Step 4	UCS-A /fc-uplink/fabric/fabricinterface # commit-buffer	Commits the transaction to the system configuration.

Example

The following example deletes the FCoE uplink interface on port 8 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 # delete fcoeinterface 1 8
UCS-A /fc-uplink/fabric/fcoeinterface* # commit-buffer
UCS-A /fc-uplink/fabric/fcoeinterface #
```

Viewing FCoE Uplink Ports

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FC Uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters FC - Uplink mode for the specific fabric.
Step 3	UCS-A /fc-uplink/fabric # show fcoeinterface	Lists the available interfaces.

Example

The following example displays the available FCoE uplink interfaces on fabric A:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # show fcoeinterface
FCoE Interface:

Slot Id      Port Id      Admin State Operational State Operational State Reason  Li
c State          Grace Prd
-----
          1          26 Enabled      Indeterminate
cense Ok
          0

Fcoe Member Port:

Port-channel Slot  Port  Oper State      State Reason
-----
1             1     10 Sfp Not Present Unknown
1             1     3 Sfp Not Present Unknown
1             1     4 Sfp Not Present Unknown
1             1     6 Sfp Not Present Unknown
1             1     8 Sfp Not Present Unknown
2             1     7 Sfp Not Present Unknown
UCS-A /fc-uplink/fabric #
```


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 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

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FCoE uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric a b	Enters fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # scope fcoeinterface slot-id port-id	Enters FCoE interface mode for the specified interface.
Step 4	Required: UCS-A /fc-uplink/fabric/fcoeinterface # set fec {auto cl74 cl91}	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.
Step 5	UCS-A /fc-uplink/fabric/fcoeinterface # commit-buffer	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
```

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 a Unified Storage Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b}	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # create interface slot-num port-num	Creates an interface for the specified appliance port.
Step 4	UCS-A /eth-storage/fabric/interface* # commit buffer	Commits the transaction to the system configuration.
Step 5	UCS-A /eth-storage/fabric/interface* # scope fc-storage	Enters FC storage mode.
Step 6	UCS-A /fc-storage* # scope fabric {a b}	Enters Ethernet storage mode for the specific appliance port.
Step 7	UCS-A /fc-storage/fabric # create interface fcoe slot-num port-num	Adds FCoE storage port mode on the appliance port mode and creates a unified storage port.

Example

The following example creates an interface for an appliance port 2 on slot 3 of fabric A, adds fc storage to the same port to convert it as a unified port, and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # create interface 3 2
UCS-A /eth-storage/fabric* # commit-buffer
UCS-A /eth-storage/fabric* # scope fc-storage
UCS-A /fc-storage*# scope fabric a
UCS-A /fc-storage/fabric* # create interface fcoe 3 2
UCS-A /fc-storage/fabric* # commit-buffer
UCS-A /fc-storage/fabric*
```

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 a Unified Uplink Port

To configure a unified uplink port, you will convert an existing FCoE uplink port as a unified port.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # create interface I5	Converts the FCoE uplink port as a unified port.
Step 4	UCS-A /eth-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates a unified uplink port on an existing FCoE port:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric b
UCS-A /eth-uplink/fabric # create interface 1 5
UCS-A /eth-uplink/fabric/interface* # commit-buffer
UCS-A /eth-uplink/interface #
```

FCoE and Fibre Channel Storage Ports

Configuring a Fibre Channel Storage or FCoE Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-storage	Enters Fibre Channel storage mode.
Step 2	UCS-A /fc-storage # scope fabric {a b}	Enters Fibre Channel storage mode for the specified fabric.
Step 3	UCS-A /fc-storage/fabric # create interface {fc fcoe} slot-num port-num	Creates an interface for the specified Fibre Channel storage port.
Step 4	UCS-A /fc-storage/fabric # commit-buffer	Commits the transaction.

Example

The following example creates an interface for Fibre Channel storage port 10 on slot 2 of fabric A and commits the transaction:

```
UCS-A# scope fc-storage
UCS-A /fc-storage # scope fabric a
UCS-A /fc-storage/fabric* # create interface fc 2 10
UCS-A /fc-storage/fabric # commit-buffer
```

What to do next

Assign a VSAN.

Unconfiguring a Fibre Channel Storage or FCoE Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-storage	Enters Fibre Channel storage mode.
Step 2	UCS-A /fc-storage # scope fabric {a b}	Enters Fibre Channel storage mode for the specified fabric.
Step 3	UCS-A /fc-storage/fabric # delete interface {fc fcoe} slot-num port-num	Deletes the interface for the specified Fibre Channel or FCoE storage port.
Step 4	UCS-A /fc-storage/fabric # commit-buffer	Commits the transaction.

Example

The following example unconfigures Fibre Channel storage port 10 on slot 2 of fabric A and commits the transaction:

```
UCS-A# scope fc-storage
UCS-A /fc-storage # scope fabric a
UCS-A /fc-storage/fabric* # delete interface fc 2 10
UCS-A /fc-storage/fabric # commit-buffer
```

Restoring a Fibre Channel Storage Port Back to an Uplink Fibre Channel Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters Fibre Channel uplink mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # create interface slot-num port-num	Creates an interface for the specified Fibre Channel uplink port.
Step 4	UCS-A /fc-uplink/fabric # commit-buffer	Commits the transaction.

Example

The following example creates an interface for Fibre Channel uplink port 10 on slot 2 of fabric A and commits the transaction:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric* # create interface 2 10
UCS-A /fc-uplink/fabric # commit-buffer
```

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.

Configuring an Uplink Ethernet Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b }	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # create port-channel port-num	Creates a port channel on the specified Ethernet uplink port, and enters Ethernet uplink fabric port channel mode.
Step 4	(Optional) UCS-A /eth-uplink/fabric/port-channel # {enable disable}	Enables or disables the administrative state of the port channel. The port channel is disabled by default.
Step 5	(Optional) UCS-A /eth-uplink/fabric/port-channel # set name port-chan-name	Specifies the name for the port channel.
Step 6	(Optional) UCS-A /eth-uplink/fabric/port-channel # set flow-control-policy policy-name	Assigns the specified flow control policy to the port channel.

	Command or Action	Purpose
Step 7	UCS-A /eth-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates a port channel on port 13 of fabric A, sets the name to portchan13a, enables the administrative state, assigns the flow control policy named flow-con-pol432 to the port channel, and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # create port-channel 13
UCS-A /eth-uplink/fabric/port-channel* # enable
UCS-A /eth-uplink/fabric/port-channel* # set name portchan13a
UCS-A /eth-uplink/fabric/port-channel* # set flow-control-policy flow-con-pol432
UCS-A /eth-uplink/fabric/port-channel* # commit-buffer
UCS-A /eth-uplink/fabric/port-channel #
```

Unconfiguring an Uplink Ethernet Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b }	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # delete port-channel <i>port-num</i>	Deletes the port channel on the specified Ethernet uplink port.
Step 4	UCS-A /eth-uplink/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example unconfigures the port channel on port 13 of fabric A and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # delete port-channel 13
UCS-A /eth-uplink/fabric* # commit-buffer
UCS-A /eth-uplink/fabric #
```

Adding a Member Port to an Uplink Ethernet Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b }	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # scope port-channel port-num	Enters Ethernet uplink fabric port channel mode for the specified port channel.
Step 4	UCS-A /eth-uplink/fabric/port-channel # create member-port slot-num port-num	Creates the specified member port from the port channel and enters Ethernet uplink fabric port channel member port mode.
Step 5	UCS-A /eth-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example adds the member port on slot 1, port 7 to the port channel on port 13 of fabric A and commits the transaction.

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # scope port-channel 13
UCS-A /eth-uplink/fabric/port-channel # create member-port 1 7
UCS-A /eth-uplink/fabric/port-channel* # commit-buffer
UCS-A /eth-uplink/fabric/port-channel #
```

Deleting a Member Port from an Uplink Ethernet Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b }	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # scope port-channel port-num	Enters Ethernet uplink fabric port channel mode for the specified port channel.
Step 4	UCS-A /eth-uplink/fabric/port-channel # delete member-port slot-num port-num	Deletes the specified member port from the port channel.

	Command or Action	Purpose
Step 5	UCS-A /eth-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example deletes a member port from the port channel on port 13 of fabric A and commits the transaction:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric a
UCS-A /eth-uplink/fabric # scope port-channel 13
UCS-A /eth-uplink/fabric/port-channel # delete member-port 1 7
UCS-A /eth-uplink/fabric/port-channel* # commit-buffer
UCS-A /eth-uplink/fabric/port-channel #
```

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.

Configuring an Appliance Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b }	Enters Ethernet storage fabric mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # create port-channel <i>port-num</i>	Creates a port channel on the specified Ethernet storage port, and enters Ethernet storage fabric port channel mode.
Step 4	(Optional) UCS-A /eth-storage/fabric/port-channel # { enable disable }	Enables or disables the administrative state of the port channel. The port channel is disabled by default.
Step 5	(Optional) UCS-A /eth-storage/fabric/port-channel # set name <i>port-chan-name</i>	Specifies the name for the port channel.
Step 6	(Optional) UCS-A /eth-storage/fabric/port-channel # set pingroupname <i>pin-group name</i>	Specifies the appliance pin target to the specified fabric and port, or fabric and port channel.

	Command or Action	Purpose
Step 7	(Optional) UCS-A /eth-storage/fabric/port-channel # set portmode { access trunk }	Specifies whether the port mode is access or trunk. By default, the mode is set to trunk.
Step 8	(Optional) UCS-A /eth-storage/fabric/port-channel # set prio <i>sys-class-name</i>	Specifies the QoS class for the appliance port. By default, the priority is set to best-effort. The <i>sys-class-name</i> argument can be one of the following class keywords: <ul style="list-style-type: none"> • FC—Use this priority for QoS policies that control vHBA traffic only. • Platinum—Use this priority for QoS policies that control vNIC traffic only. • Gold—Use this priority for QoS policies that control vNIC traffic only. • Silver—Use this priority for QoS policies that control vNIC traffic only. • Bronze—Use this priority for QoS policies that control vNIC traffic only. • Best Effort—Do not use this priority. It is reserved for the Basic Ethernet traffic lane. If you assign this priority to a QoS policy and configure another system class as CoS 0, Cisco UCS Manager does not default to this system class. It defaults to the priority with CoS 0 for that traffic.
Step 9	(Optional) UCS-A /eth-storage/fabric/port-channel # set speed { 1gbps 2gbps 4gbps 8gbps auto }	Specifies the speed for the port channel.
Step 10	UCS-A /eth-storage/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates a port channel on port 13 of fabric A and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # create port-channel 13
UCS-A /eth-storage/fabric/port-channel* # enable
UCS-A /eth-storage/fabric/port-channel* # set name portchan13a
UCS-A /eth-storage/fabric/port-channel* # set pingroupname pingroup1
UCS-A /eth-storage/fabric/port-channel* # set portmode access
UCS-A /eth-storage/fabric/port-channel* # set prio fc
UCS-A /eth-storage/fabric/port-channel* # set speed 2gbps
```

```
UCS-A /eth-storage/fabric/port-channel* # commit-buffer
UCS-A /eth-storage/fabric/port-channel #
```

Unconfiguring an Appliance Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b }	Enters Ethernet storage fabric mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # delete port-channel port-num	Deletes the port channel from the specified Ethernet storage port.
Step 4	UCS-A /eth-storage/fabric # commit-buffer	Commits the transaction to the system configuration.

Example

The following example unconfigures the port channel on port 13 of fabric A and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # delete port-channel 13
UCS-A /eth-storage/fabric* # commit-buffer
UCS-A /eth-storage/fabric #
```

Enabling or Disabling an Appliance Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b }	Enters Ethernet storage mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # scope port-channel port-chan-name	Enters Ethernet storage port channel mode.
Step 4	UCS-A /eth-storage/fabric/port-channel # {enable disable }	Enables or disables the administrative state of the port channel. The port channel is disabled by default.

	Command or Action	Purpose
Step 5	UCS-A /eth-storage/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example enables port channel 13 on fabric A and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # scope port-channel 13
UCS-A /eth-storage/fabric/port-channel* # enable
UCS-A /eth-storage/fabric/port-channel* # commit-buffer
UCS-A /eth-storage/fabric/port-channel #
```

Adding a Member Port to an Appliance Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b }	Enters Ethernet storage fabric mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # scope port-channel <i>port-num</i>	Enters Ethernet storage fabric port channel mode for the specified port channel.
Step 4	UCS-A /eth-storage/fabric/port-channel # create member-port <i>slot-num port-num</i>	Creates the specified member port from the port channel and enters Ethernet storage fabric port channel member port mode.
Step 5	UCS-A /eth-storage/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example adds the member port on slot 1, port 7 to the port channel on port 13 of fabric A and commits the transaction.

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # scope port-channel 13
UCS-A /eth-storage/fabric/port-channel # create member-port 1 7
UCS-A /eth-storage/fabric/port-channel* # commit-buffer
UCS-A /eth-storage/fabric/port-channel #
```

Deleting a Member Port from an Appliance Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-storage	Enters Ethernet storage mode.
Step 2	UCS-A /eth-storage # scope fabric {a b }	Enters Ethernet storage fabric mode for the specified fabric.
Step 3	UCS-A /eth-storage/fabric # scope port-channel port-num	Enters Ethernet storage fabric port channel mode for the specified port channel.
Step 4	UCS-A /eth-storage/fabric/port-channel # delete member-port slot-num port-num	Deletes the specified member port from the port channel.
Step 5	UCS-A /eth-storage/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example deletes a member port from the port channel on port 13 of fabric A and commits the transaction:

```
UCS-A# scope eth-storage
UCS-A /eth-storage # scope fabric a
UCS-A /eth-storage/fabric # scope port-channel 13
UCS-A /eth-storage/fabric/port-channel # delete member-port 1 7
UCS-A /eth-storage/fabric/port-channel* # commit-buffer
UCS-A /eth-storage/fabric/port-channel #
```

Fibre Channel Port Channels

A Fibre Channel port channel allows you to group several physical Fibre Channel ports (link aggregation) to create one logical Fibre Channel link to provide fault-tolerance and high-speed connectivity. In Cisco UCS Manager, you create a port channel first and then add Fibre Channel ports to the port channel.



Note Fibre Channel port channels are not compatible with non-Cisco technology.

You can create up to four Fibre Channel port channels in each Cisco UCS domain with Cisco UCS 6300 6400, and 6500 Series Fabric Interconnects. Each Fibre Channel port channel can include a maximum of 16 uplink Fibre Channel ports.

You can create up to two Fibre Channel port channels in each Cisco UCS domain with Cisco UCS 6324 fabric interconnects. Each Fibre Channel port channel can include a maximum of four uplink Fibre Channel ports.

Ensure that the Fibre Channel port channel on the upstream NPIV switch is configured with its channel mode as **active**. If both the member port(s) and peer port(s) do not have the same channel mode configured, the port

channel will not come up. When the channel mode is configured as **active**, the member ports initiate port channel protocol negotiation with the peer port(s) regardless of the channel group mode of the peer port. If the peer port, while configured in a channel group, does not support the port channel protocol, or responds with a nonnegotiable status, it defaults to the On mode behavior. The **active** port channel mode allows automatic recovery without explicitly enabling and disabling the port channel member ports at either end.

This example shows how to configure channel mode as active:

```
switch(config)# int po114
switch(config-if)# channel mode active
```

Configuring a Fibre Channel Port Channel



Note If you are connecting two Fibre Channel port channels, the admin speed for both port channels must match for the link to operate. If the admin speed for one or both of the Fibre Channel port channels is set to auto, Cisco UCS adjusts the admin speed automatically.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b }	Enters Fibre Channel uplink fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # create port-channel port-num	Creates a port channel on the specified Fibre Channel uplink port, and enters Fibre Channel uplink fabric port channel mode.
Step 4	(Optional) UCS-A /fc-uplink/fabric/port-channel # {enable disable}	Enables or disables the administrative state of the port channel. The port channel is disabled by default.
Step 5	(Optional) UCS-A /fc-uplink/fabric/port-channel # set name port-chan-name	Specifies the name for the port channel.
Step 6	(Optional) UCS-A /fc-uplink/fabric/port-channel # set speed {1gbps 2gbps 4gbps 8gbps auto}	Specifies the speed for the port channel.
Step 7	UCS-A /fc-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates port channel 13 on fabric A, sets the name to portchan13a, enables the administrative state, sets the speed to 2 Gbps, and commits the transaction:

```

UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # create port-channel 13
UCS-A /fc-uplink/fabric/port-channel* # enable
UCS-A /fc-uplink/fabric/port-channel* # set name portchan13a
UCS-A /fc-uplink/fabric/port-channel* # set speed 2gbps
UCS-A /fc-uplink/fabric/port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/port-channel #

```

Configuring a FCoE Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FC Uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters FC - Uplink mode for the specific fabric.
Step 3	UCS-A /fc-uplink/fabric # create fcoe-port-channel number	Creates port channel for the specified FCoE uplink port.
Step 4	UCS-A /fc-uplink/fabric/fabricinterface # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates an interface for FCoE uplink port 1 on slot 4 of fabric A and commits the transaction:

```

UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # create fcoe-port-channel 4
UCS-A /fc-uplink/fabric/fcoe-port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/fcoe-port-channel #

```

Adding Channel Mode Active To The Upstream NPIV Fibre Channel Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters Fibre Channel uplink fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # create port-channel port-num	Creates a port channel on the specified Fibre Channel uplink port, and enters Fibre Channel uplink fabric port channel mode.

	Command or Action	Purpose
Step 4	(Optional) UCS-A /fc-uplink/fabric/port-channel # {enable disable}	Enables or disables the administrative state of the port channel. The port channel is disabled by default.
Step 5	(Optional) UCS-A /fc-uplink/fabric/port-channel # set name port-chan-name	Specifies the name for the port channel.
Step 6	(Optional) UCS-A /fc-uplink/fabric/port-channel # scope port-chan-name	Specifies the name for the port channel.
Step 7	(Optional) UCS-A /fc-uplink/fabric/port-channel # channel mode {active}	Configures the channel-mode active on the upstream NPIV switch.
Step 8	UCS-A /fc-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example enables channel mode to active:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # create port-channel 13
UCS-A /fc-uplink/fabric/port-channel* # enable
UCS-A /fc-uplink/fabric/port-channel* # set name portchan13a
UCS-A /fc-uplink/fabric/port-channel* # channel mode active
UCS-A /fc-uplink/fabric/port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/port-channel # exit
UCS-A /fc-uplink/fabric/ # show port-channel database

portchan13a
  Administrative channel mode is active
  Operational channel mode is active

UCS-A /fc-uplink/fabric/ #
```

Enabling or Disabling a Fibre Channel Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b }	Enters Fibre Channel uplink mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # scope port-channel port-chan-name	Enters Fibre Channel uplink port channel mode.

	Command or Action	Purpose
Step 4	UCS-A /fc-uplink/fabric/port-channel # { enable disable }	Enables or disables the administrative state of the port channel. The port channel is disabled by default.

Example

The following example enables port channel 13 on fabric A and commits the transaction:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # scope port-channel 13
UCS-A /fc-uplink/fabric/port-channel* # enable
UCS-A /fc-uplink/fabric/port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/port-channel #
```

Adding a Member Port to a Fibre Channel Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric { a b }	Enters Fibre Channel uplink fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # scope port-channel <i>port-num</i>	Enters Fibre Channel uplink fabric port channel mode for the specified port channel.
Step 4	UCS-A /fc-uplink/fabric/port-channel # create member-port <i>slot-num port-num</i>	Creates the specified member port from the port channel and enters Fibre Channel uplink fabric port channel member port mode.
Step 5	UCS-A /fc-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example adds the member port on slot 1, port 7 to port channel 13 on fabric A and commits the transaction.

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # scope port-channel 13
UCS-A /fc-uplink/fabric # create member-port 1 7
UCS-A /fc-uplink/fabric/port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/port-channel #
```

Deleting a Member Port from a Fibre Channel Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters Fibre Channel uplink fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # scope port-channel port-num	Enters Fibre Channel uplink fabric port channel mode for the specified port channel.
Step 4	UCS-A /fc-uplink/fabric/port-channel # delete member-port slot-num port-num	Deletes the specified member port from the port channel.
Step 5	UCS-A /fc-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example deletes a member port from port channel 13 on fabric A and commits the transaction:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # scope port-channel 13
UCS-A /fc-uplink/fabric # delete member-port 1 7
UCS-A /fc-uplink/fabric/port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/port-channel #
```

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.

Configuring a FCoE Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters FC Uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters FC - Uplink mode for the specific fabric.
Step 3	UCS-A /fc-uplink/fabric # create fcoe-port-channel number	Creates port channel for the specified FCoE uplink port.
Step 4	UCS-A /fc-uplink/fabric/fabricinterface # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates an interface for FCoE uplink port 1 on slot 4 of fabric A and commits the transaction:

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # create fcoe-port-channel 4
UCS-A /fc-uplink/fabric/fcoe-port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/fcoe-port-channel #
```

Adding a Member Port to a FCoE Uplink Port Channel

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope fc-uplink	Enters Fibre Channel uplink mode.
Step 2	UCS-A /fc-uplink # scope fabric {a b}	Enters Fibre Channel uplink fabric mode for the specified fabric.
Step 3	UCS-A /fc-uplink/fabric # scope fcoe-port-channel ID	Enters FCoE uplink port channel mode for the specified port channel.
Step 4	UCS-A /fc-uplink/fabric/fcoe-port-channel # create member-port slot-num port-num	Creates the specified member port from the port channel and enters FCoE uplink fabric port channel member port mode.

	Command or Action	Purpose
		<p>Note If the FCoE uplink port channel is a unified uplink port channel, you will get the following message:</p> <p>Warning: if this is a unified port channel then member will be added to the ethernet port channel of the same id as well.</p>
Step 5	UCS-A /fc-uplink/fabric/fcoe-port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example adds the member port on slot 1, port 7 to FCoE port channel 13 on fabric A and commits the transaction.

```
UCS-A# scope fc-uplink
UCS-A /fc-uplink # scope fabric a
UCS-A /fc-uplink/fabric # scope fcoe-port-channel 13
UCS-A /fc-uplink/fabric # create member-port 1 7
UCS-A /fc-uplink/fabric/fcoe-port-channel* # commit-buffer
UCS-A /fc-uplink/fabric/fcoe-port-channel #
```

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.

Configuring a Unified Uplink Port Channel

To configure a unified uplink port channel, you will convert an existing FCoE uplink port channel as a unified port channel.

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-uplink	Enters Ethernet uplink mode.
Step 2	UCS-A /eth-uplink # scope fabric {a b}	Enters Ethernet uplink fabric mode for the specified fabric.
Step 3	UCS-A /eth-uplink/fabric # create port-channel ID	Creates a port channel for the specified Ethernet uplink port.
Step 4	UCS-A /eth-uplink/fabric/port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example creates a unified uplink port channel on an existing FCoE port channel:

```
UCS-A# scope eth-uplink
UCS-A /eth-uplink # scope fabric b
UCS-A /eth-uplink/fabric # create port-channel 2
UCS-A /eth-uplink/fabric/port-channel* # commit-buffer
UCS-A /eth-uplink/fabric #
```

Event Detection and Action

Cisco UCS Manager uses the statistics collection policy to monitor and trigger an alarm when there are faults in the network interface ports connected from the I/O Module (IOM) to the fabric interconnect.

The error statistics for the network interface ports is called NiErrStats and consists of the following errors:

NiErrStats	Description
frameTx	Collects the TX_FRM_ERROR counter values.
tooLong	Collects the RX_TOOLONG counter values.
tooShort	Collects the sum of RX_UNDERSIZE and RX_FRAGMENT counter values.
Crc	Collects the sum of RX_CRERR_NOT_STOMPED and RX_CRCERR_STOMPED counter values.
InRange	Collects the RX_INRANGEERR counter values.



Note Only active ports collect the network interface port statistics and send the information to Cisco UCS Manager.

Policy-Based Port Error Handling

If Cisco UCS Manager detects any errors on active NI ports, and if the error-disable feature is enabled, Cisco UCS Manager automatically disables the respective FI port that is connected to the NI port that had errors. When a FI 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 FI port is error-disabled and that the connected NI Port has errors.
- It eliminates the possibility that this port can cause other ports, which are connected to the same Chassis/FEX, to fail. 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.

Creating Threshold Definition

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope eth-server	Enters Ethernet storage mode.
Step 2	UCS-A/eth-server # scope stats-threshold-policy default	Enters statistics threshold policy mode.
Step 3	UCSA/eth-server/stats-threshold-policy # create class class-name	Creates the specified statistics threshold policy class and enters the organization statistics threshold policy class mode. To see a list of the available class name keywords, enter the create class ? command in organization threshold policy mode.
Step 4	UCS-A/eth-server/stats-threshold-policy/class # create property property-name	Creates the specified statistics threshold policy class property and enters the organization statistics threshold policy class property mode. To see a list of the available property name keywords, enter the create property ? command in organization threshold policy class mode.
Step 5	UCS-A/eth-server/stats-threshold-policy/class/property # set normal-value value	Specifies the normal value for the class property. The <i>value</i> format can vary depending on the class property being configured. To see the required format, enter the set normal-value ? command in organization statistics threshold policy class property mode.

	Command or Action	Purpose
Step 6	UCS-A/eth-server/stats-threshold-policy/class/property # create threshold-value { <i>above-normal</i> <i>below-normal</i> } { <i>cleared</i> <i>condition</i> <i>critical</i> <i>info</i> <i>major</i> <i>minor</i> <i>warning</i> }	Creates the specified threshold value for the class property and enters the organization statistics threshold policy class property threshold value mode.
Step 7	UCS-A/eth-server/stats-threshold-policy/class/property/threshold-value # set { deescalating escalating } <i>value</i>	Specifies the deescalating and escalating class property threshold value. The <i>value</i> format can vary depending on the class property threshold value being configured. To see the required format, enter the set deescalating ? or set escalating ? command in the organization statistics threshold policy class property threshold value mode.
Step 8	UCS-A/eth-server/stats-threshold-policy/class/property/threshold-value # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to create a threshold definition:

```
UCS-A # scope eth-server
UCS-A /eth-server # scope stats-threshold-policy default
UCS-A /eth-server/stats-threshold-policy # create class ni-ether-error-stats
UCS-A /eth-server/stats-threshold-policy/class* # create property crc-delta
UCS-A /eth-server/stats-threshold-policy/class/property* # set normal-value 0
UCS-A /eth-server/stats-threshold-policy/class/property* # create threshold-value above-normal
major
UCS-A /eth-server/stats-threshold-policy/class/property/threshold-value* # set escalating
5
UCS-A /eth-server/stats-threshold-policy/class/property/threshold-value* # set deescalating
3
UCS-A /eth-server/stats-threshold-policy/class/property/threshold-value* # commit-buffer
```

Configuring Error Disable on a Fabric Interconnect Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope eth-server	Enters Ethernet storage mode.
Step 2	UCS-A/eth-server # scope stats-threshold-policy default	Enters statistics threshold policy mode.
Step 3	UCS-A/eth-server/stats-threshold-policy # scope class class-name	Enters the organization statistics threshold policy class mode for the specified statistics threshold policy class.

	Command or Action	Purpose
Step 4	UCS-A/eth-server/stats-threshold-policy/class # scope property <i>property-name</i>	Enters the organization statistics threshold policy class property mode for the specified statistics threshold policy class property.
Step 5	UCS-A/eth-server/stats-threshold-policy/class/property # set error-disable-fi-port {yes no}	Specifies the error disable state for the class property. Use the no option to disable error disable for the class property.
Step 6	UCS-A/eth-server/stats-threshold-policy/class/property* # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to enable error disable on an FI port:

```
UCS-A # scope eth-server
UCS-A /eth-server # scope stats-threshold-policy default
UCS-A /eth-server/stats-threshold-policy # scope class ni-ether-error-stats
UCS-A /eth-server/stats-threshold-policy/class # scope property crc-delta
UCS-A /eth-server/stats-threshold-policy/class/property # set error-disable-fi-port yes
UCS-A /eth-server/stats-threshold-policy/class/property* # commit-buffer
```

Configuring Auto Recovery on a Fabric Interconnect Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope eth-server	Enters Ethernet storage mode.
Step 2	UCS-A/eth-server # scope stats-threshold-policy default	Enters statistics threshold policy mode.
Step 3	UCSA/eth-server/stats-threshold-policy # scope class <i>class-name</i>	Enters the organization statistics threshold policy class mode for the specified statistics threshold policy class.
Step 4	UCS-A/eth-server/stats-threshold-policy/class # scope property <i>property-name</i>	Enters the organization statistics threshold policy class property mode for the specified statistics threshold policy class property.
Step 5	UCS-A/eth-server/stats-threshold-policy/class/property # set auto-recovery {enabled disabled}	Specifies the auto recovery state for the class property. Use the disabled option to disable auto recovery for the class property.

	Command or Action	Purpose
Step 6	UCS-A/eth-server/stats-threshold-policy/class/property* # set auto-recovery-time <i>time</i>	Specifies the time in minutes after which the port is automatically re-enabled. The auto recovery time can range from 0 minutes to 4294967295 minutes.
Step 7	UCS-A/eth-server/stats-threshold-policy/class/property* # commit-buffer	Commits the transaction to the system configuration.

Example

The following example shows how to configure auto recovery on an FI port:

```
UCS-A # scope eth-server
UCS-A /eth-server # scope stats-threshold-policy default
UCS-A /eth-server/stats-threshold-policy # scope class ni-ether-error-stats
UCS-A /eth-server/stats-threshold-policy/class # scope property crc-delta
UCS-A /eth-server/stats-threshold-policy/class/property # set auto-recovery enabled
UCS-A /eth-server/stats-threshold-policy/class/property* # set auto-recovery-time 5
UCS-A /eth-server/stats-threshold-policy/class/property* # commit-buffer
```

Viewing the Network Interface Port Error Counters

Procedure

	Command or Action	Purpose
Step 1	UCS-A # scope chassis <i>chassis-num</i>	Enters chassis mode for the specified chassis.
Step 2	UCS-A/chassis # scope iom {a b}	Enters chassis IOM mode for the specified IOM.
Step 3	UCS-A/chassis/iom # scope port-group fabric	Enters the network interface port.
Step 4	UCS-A/chassis/iom/port-group # scope fabric-if <i>fabric-if number</i>	Enters the specified network interface port number.
Step 5	UCS-A/chassis/iom/port-group/fabric-if # show stats	Displays the error counters for the network interface port.

Example

The following example shows how to display the statistics for the network interface ports:

```
UCS-A # scope chassis 1
UCS-A/chassis # scope iom a
UCS-A/chassis/iom # scope port-group fabric
UCS-A/chassis/iom/port-group # scope fabric-if 1
UCS-A/chassis/iom/port-group/fabric-if # show stats
NI Ether Error Stats:
Time Collected: 2014-08-20T15:37:24:688
```

```

Monitored Object: sys/chassis-1/slot-1/fabric/port-1/ni-err-stats
Suspect: Yes
Crc (errors): 5000
Frame Tx (errors): 0
Too Long (errors): 0
Too Short (errors): 0
In Range (errors): 0
Thresholded: 0

```

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

	Command or Action	Purpose
Step 1	UCS-A# scope chassis <i>chassis-num</i>	Enters chassis mode for the specified chassis.
Step 2	UCS-A /chassis # scope iom {a b}	Enters chassis IOM mode for the specified IOM.
Step 3	UCS-A /chassis/iom # scope port group	Enters port group mode for the specified port group.
Step 4	UCS-A /chassis/iom/port group # show host-port-channel [detail expand]	Displays the adapter port channels on the specified chassis.

Example

The following example shows how to display information on host port channels within a port group mode:

```

UCS-A # scope chassis 1
UCS-A /chassis # scope iom a
UCS-A /chassis/iom # scope port group
UCS-A /chassis/iom/port group # show host-port-channel

```

Host Port channel:

```

Port Channel Id Fabric ID Oper State          State Reason
-----
          1289 B           Up
          1290 B           Up
          1306 B           Up
          1307 B           Up
          1309 B           Up

```

```

1315 B          Up
UCS-A /chassis/iom/port group #

```

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:
 12_da: 1 12_sa: 1 12_vlan: 0
 13_da: 1 13_sa: 1
 14_da: 1 14_sa: 1
FCoE 12_da: 1 12_sa: 1 12_vlan: 0
FCoE 13_did: 1 13_sid: 1 13_oxid: 1

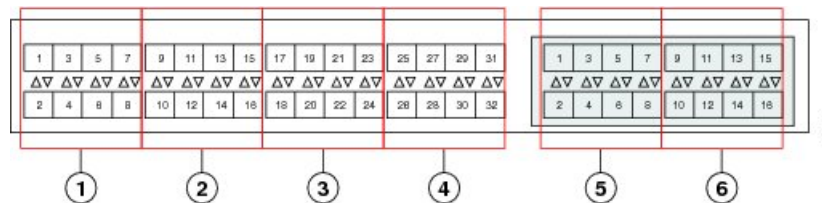
```

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

- 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.
- Step 2** To include links from individual chassis in a fabric port channel during chassis discovery, set the link grouping preference in the chassis connectivity policy to port channel.

Step 3 After chassis discovery, enable or disable additional fabric port channel member ports.

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

	Command or Action	Purpose
Step 1	UCS-A# scope eth-server	Enters Ethernet server mode.
Step 2	UCS-A /eth-server # scope fabric {a b}	Enters Ethernet server fabric mode for the specified fabric.
Step 3	UCS-A /eth-server/fabric # show fabric-port-channel [detail expand]	Displays fabric port channels on the specified fabric interconnect.

Example

The following example displays information about configured fabric port channels on fabric interconnect A:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric a
UCS-A /eth-server/fabric # show fabric-port-channel
Fabric Port Channel:
  Port Channel Id Chassis Id Admin State Oper State      State Reason
  -----
           1025 1           Enabled   Failed       No operational members
           1026 2           Enabled   Up
UCS-A /eth-server/fabric #
```

Enabling or Disabling a Fabric Port Channel Member Port

Procedure

	Command or Action	Purpose
Step 1	UCS-A# scope eth-server	Enters Ethernet server mode.
Step 2	UCS-A /eth-server # scope fabric {a b}	Enters Ethernet server fabric mode for the specified fabric.

	Command or Action	Purpose
Step 3	UCS-A /eth-server/fabric # scope fabric-port-channel <i>port-chan-id</i>	Enters Ethernet server fabric, fabric port channel mode for the specified fabric.
Step 4	UCS-A /eth-server/fabric/fabric-port-channel # scope member-port <i>slot-id port-id</i>	Enters Ethernet server fabric, fabric port channel mode for the specified member port.
Step 5	UCS-A /eth-server/fabric/fabric-port-channel # { enable disable }	Enables or disables the specified member port.
Step 6	UCS-A /eth-server/fabric/fabric-port-channel # commit-buffer	Commits the transaction to the system configuration.

Example

The following example disables fabric channel member port 1 31 on fabric port channel 1025 and commits the transaction:

```
UCS-A# scope eth-server
UCS-A /eth-server # scope fabric a
UCS-A /eth-server/fabric # scope fabric-port-channel 1025
UCS-A /eth-server/fabric/fabric-port-channel # scope member-port 1 31
UCS-A /eth-server/fabric/fabric-port-channel/member-port # disable
UCS-A /eth-server/fabric/fabric-port-channel/member-port* # commit-buffer
UCS-A /eth-server/fabric/fabric-port-channel/member-port #
```