

Cisco UCS 6400 Series Fabric Interconnect Hardware Installation Guide

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Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

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Preface

This preface contains the following topics:

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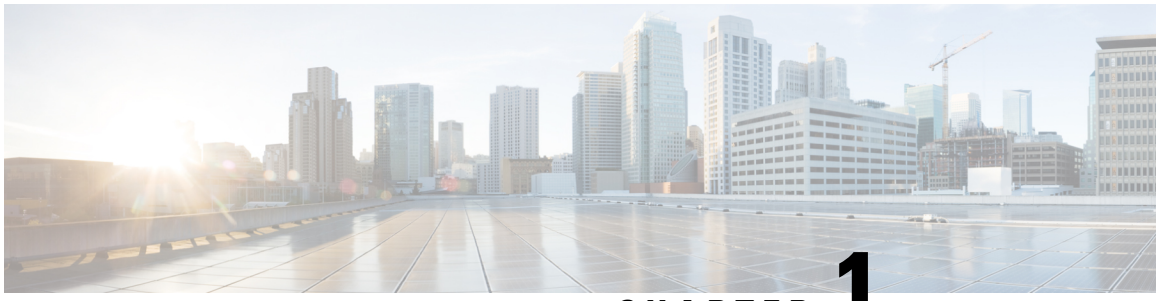
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Cisco Bug Search Tool (BST) is a web-based tool that acts as a gateway to the Cisco bug tracking system that maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. BST provides you with detailed defect information about your products and software.



CHAPTER 1

Product Overview

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Cisco UCS Fabric Interconnect Overview

The Cisco UCS Fabric Interconnects provide both network connectivity and management capabilities to the Cisco UCS system. The fabric interconnect provides Ethernet and Fibre Channel to the servers in the system. The servers connect to the fabric interconnect, and then to the LAN or SAN.

Each fabric interconnect runs Cisco UCS Manager software to fully manage all Cisco UCS elements. High availability redundancy can be achieved when a fabric interconnect is connected to another fabric interconnect through the L1 or L2 port on each device.

Cisco UCS 6454 Fabric Interconnect

The Cisco UCS 6454 Fabric Interconnect (FI) is a 1-RU top-of-rack switch that mounts in a standard 19-inch rack such as the Cisco R Series rack.

The Cisco UCS 6454 Fabric Interconnect has 48 10/25 Gb SFP28 ports (16 unified ports) and 6 40/100 Gb QSFP28 ports. Each 40/100 Gb port can break out into 4 x 10/25 Gb uplink ports. The sixteen unified ports support 10/25 GbE or 8/16/32G Fibre Channel speeds.

Note The Cisco UCS 6454 Fabric Interconnect supported 8 unified ports (ports 1 - 8) with Cisco UCS Manager 4.0(1) and 4.0(2), but with release 4.0(4) and later it supports 16 unified ports (ports 1 - 16).

The Cisco UCS 6454 Fabric Interconnect supports:

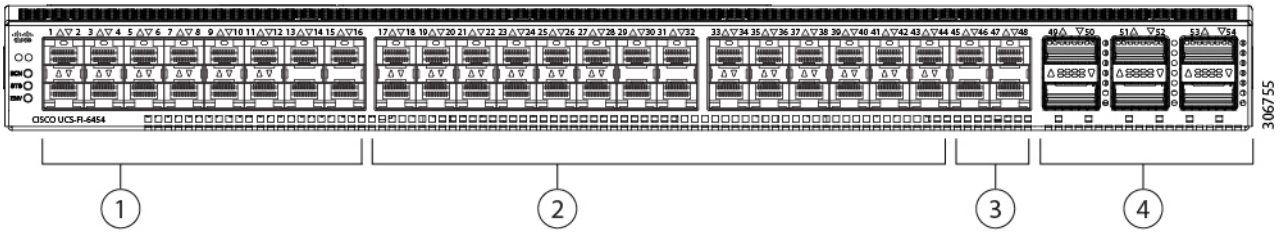
- Maximum of 8 FCoE port channels
- Or 4 SAN port channels
- Or a maximum of 8 SAN port channels and FCoE port channels (4 each)

The Cisco UCS 6454 Fabric Interconnect also has one network management port, one console port for setting the initial configuration, and one USB port for saving or loading configurations. The FI also includes L1/L2 ports for connecting two fabric interconnects for high availability.

The Cisco UCS 6454 Fabric Interconnect also contains a CPU board that consists of:

- Intel Xeon D-1528 v4 Processor, 1.6 GHz
- 64 GB of RAM
- 8 MB of NVRAM (4 x NVRAM chips)
- 128 GB SSD (bootflash)

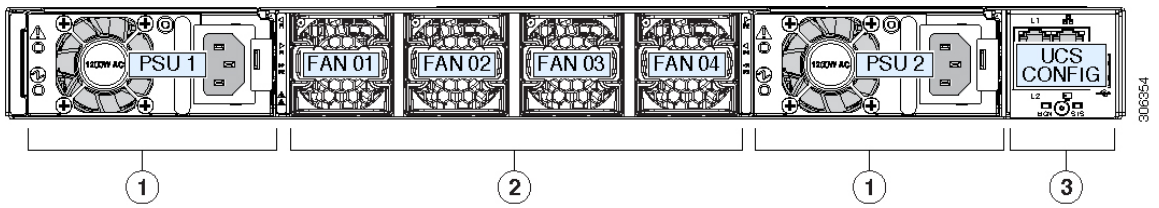
Figure 1: Cisco UCS 6454 Fabric Interconnect Rear View



1	Ports 1-16 (Unified Ports 10/25 Gbps Ethernet or FCoE or 8/16/32 Gbps Fibre Channel) **Note** When using Cisco UCS Manager releases earlier than 4.0(4), only ports 1-8 are Unified Ports.	2	Ports 17-44 (10/25 Gbps Ethernet or FCoE) **Note** When using Cisco UCS Manager releases earlier than 4.0(4), ports 9-44 are 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) Each of these ports can be 4 x 10/25 Gbps Ethernet or FCoE uplink ports when using an appropriate breakout cable.

The Cisco UCS 6454 Fabric Interconnect chassis has two power supplies and four fans. Two of the fans provide front to rear airflow.

Figure 2: Cisco UCS 6454 Fabric Interconnect Front View



1	Power supply and power cord connector	**2**	Fans 1 through 4, numbered left to right, when facing the front of the chassis.
3	L1 port, L2 port, RJ45, console, USB port, and LEDs		

Cisco UCS 64108 Fabric Interconnect

The Cisco UCS 64108 Fabric Interconnect (FI) is a 2-RU top-of-rack switch that mounts in a standard 19-inch rack such as the Cisco R Series rack. This high-density FI is an ideal upgrade from the high-density Cisco UCS 6296 Fabric Interconnect.

The high-density Cisco UCS 64108 Fabric Interconnect has 96 10/25 Gb SFP28 ports and 12 40/100 Gb QSFP28 ports. Each 40/100 Gb port can break out into 4 x 10/25 Gb uplink ports. Sixteen ports (1-16) are unified ports that support 10/25 GbE or 8/16/32G Fibre Channel speeds.The Cisco UCS 64108 Fabric Interconnect supports:

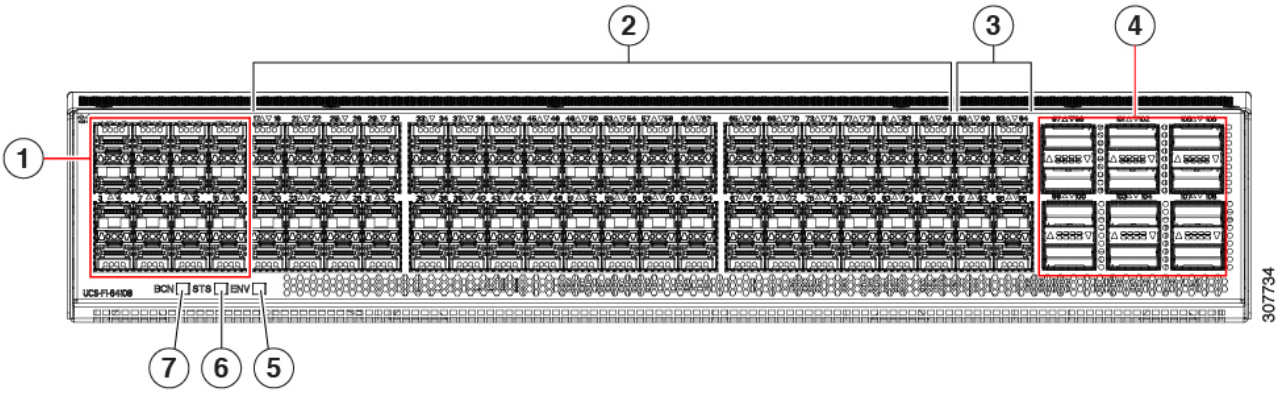
- Maximum of 8 FCoE port channels
- Or 4 SAN Ports
- Or a maximum of 8 SAN port channels and FCoE port channels (4 each)

The Cisco UCS 64108 Fabric Interconnect also has one network management port, one RS-232 serial console port for setting the initial configuration, and one USB port for saving or loading configurations. The FI also includes L1/L2 ports for connecting two fabric interconnects in a high-availability configuration.

The Cisco UCS 64108 Fabric Interconnect also contains a CPU board that consists of:

- Intel Xeon Processor, 6 core
- 64 GB of RAM
- 8 MB of NVRAM (4 x NVRAM chips)
- 128 GB SSD (bootflash)

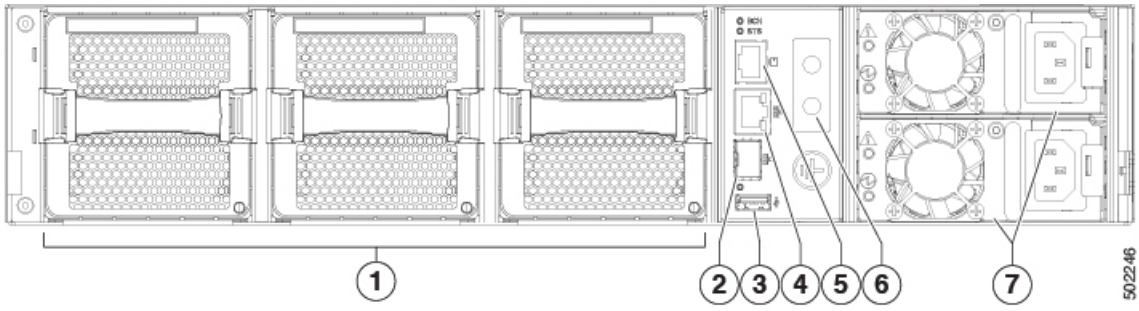
Figure 3: Cisco UCS 64108 Fabric Interconnect Rear View



1	Ports 1 - 16 Unified ports: • 10/25 Gbps Ethernet or FCoE • 8/16/32 Gbps Fibre Channel	2	Ports 17-88 10/25 Gbps Ethernet or FCoE
3	Ports 89-96 1/10/25 Gbps Ethernet or FCoE	4	Uplink Ports 97-108 (40/100 Gbps Ethernet or FCoE) Each of these ports can be 4 x 10/25 Gbps Ethernet or FCoE uplink ports when using a breakout cable.
5	System environment (fan fault) LED	6	System status LED
7	Beacon LED		

The Cisco UCS 64108 Fabric Interconnect has two power supplies (redundant as 1+1) and three fans (redundant as 2+1).

Figure 4: Cisco UCS 64108 Fabric Interconnect Front View



1	Fan modules (3) with slots from 1 (left) to 3 (right)	**2**	Management Port (1 SFP optical port)
3	USB port (1)	**4**	Management Port (1 RJ-45 copper port)

5	Console port (1)	**6**	Grounding pad for two-hole grounding lug (under protective label)
7	Power supply modules (1 or 2) (AC power supplies shown) with slots numbered 1 (top) and 2 (bottom)		

Ports on the Cisco UCS Fabric Interconnect

The ports on the fabric interconnects can be configured to carry either Ethernet or Fibre Channel traffic. You can configure only ports 1-16 to carry Fibre Channel traffic. The ports must be configured before they can be used by a Cisco UCS domain.



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. The port can be disabled and enabled after it has been configured.

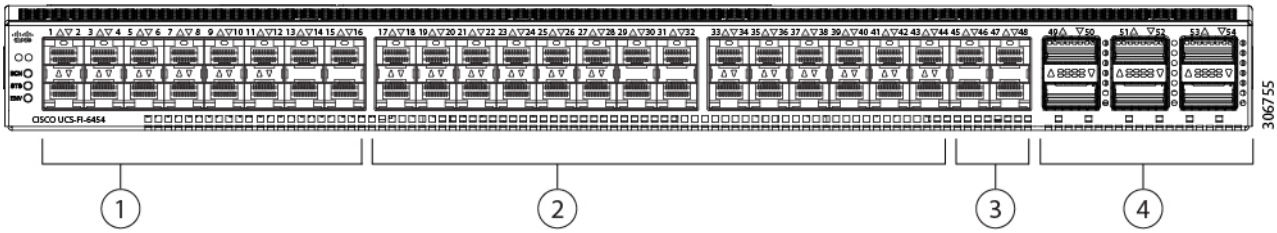
The following table summarizes the Cisco UCS Fabric Interconnects.

	Cisco UCS 6454 FI
Description	54-Port Fabric Interconnect
Form factor	1-RU
Number of fixed 10 GB Interfaces	48 10/25G interfaces
Number of Unified Ports	16 This FI supported 8 unified ports (ports 1 - 8) with Cisco UCS Manager 4.0(1) and 4.0(2), but with Release 4.0(4) and later it supports 16 unified ports (ports 1 - 16).
Unified Port Range	Ports 1-16
Unified Port Speeds	10/25 Gbps or 8/16/32-Gbps FC
Number of 40-Gbps ports	6 40/100 Gigabit ports
Compatibility with the IOM	UCS 2204, UCS 2208, UCS 2408
Compatibility with the FEX	Cisco Nexus 2232PP Cisco Nexus 2232TM-E
Expansion Slots	None
Fan Modules	4
Power Supplies	2 (AC/DC/HVDC available)

Port Speeds and Types

Ports on the fabric interconnects are numbered and grouped according to their function. The ports are numbered top to bottom and left to right. The following figures show the port numbering and define port speeds and the types of ports that can be configured. For more information on how to configure the port modes, refer to *"Configuring Port Modes for a Fabric Interconnect"* in the *Cisco UCS Network Management Guide, Release 4.0*.

Figure 5: Rear View of Cisco UCS 6454 FI, Port Numbers



1	Ports 1–16. Unified Ports can operate as 10/25 Gbps Ethernet or FCoE; or 8/16/32 Gbps Fibre Channel. Port type in 8G/16G/32G FC mode: FC uplink port Port types in 10G/25G mode: • FCoE uplink port • Server port • Appliance port (the FI must be in Ethernet-End-Host mode) • Monitor port **Note** When using Cisco UCS Manager releases earlier than 4.0(4), only ports 1-8 are Unified Ports.	2	Ports 17–44. Each port can operate as 10G/25G Ethernet. Port types in 10G/25G mode: • FCoE uplink port • Server port • Appliance port (the FI must be in Ethernet-End-Host mode) • Monitor port **Note** When using Cisco UCS Manager releases earlier than 4.0(4), ports 9-44 are 10/25 Gbps Ethernet or FCoE. (Only ports 1-8 were Unified Ports in earlier releases.)

3	Ports 45–48. Each port can operate as 1G/10G/25G Ethernet or FCoE port.	4	Uplink Ports 49–54. Each port can operate as 40G/100G Ethernet or FCoE. With a breakout cable, each of these ports can operate as 4 x 10G or 4 x 25G Ethernet or FCoE ports. Port types: • Uplink port • FCoE uplink port • Monitor port

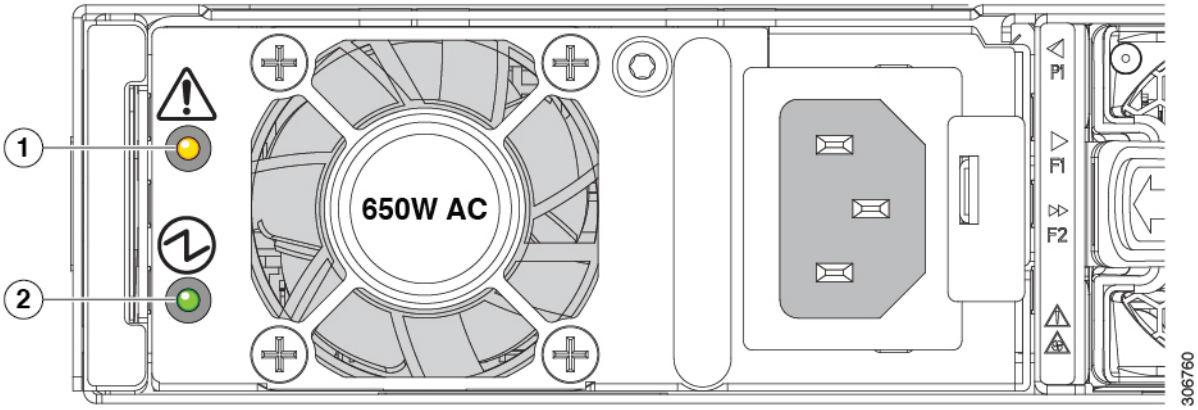
Power Supplies

The fabric interconnect has two power supplies that are accessible from the front of the chassis. The two power supplies support 1+1 redundancy.

Table 1: Power Supply Models

Cisco PID	Fabric Interconnect	Source	Wattage
UCS-PSU-6332-AC (The Cisco UCS 6454 FI shares the same AC power supply and ordering PID with the Cisco UCS 6300 Series.)	Cisco UCS 6454	110 to 240 VAC	650 W AC
UCS-PSU-64108-AC	Cisco UCS 64108	90 to 264 VAC	1200 W AC
UCS-PSU-6332-DC (The Cisco UCS 6400 Series shares the same DC power supply and ordering PID with the Cisco UCS 6300 Series.)	• Cisco UCS 6454 • Cisco UCS 64108	-48 VDC	930 W DC

Figure 6: Power Supply LEDs (650 W AC Shown)



Power supplies have two LEDs: one for power status and one for a failure condition.

1	Fault or Error LED	2	Power LED

LED	State	Description
Power LED	Solid green	Power supply is on and functioning properly
	Blinking green	3.3 V voltage standby (VSB) is on but the power supply is not powering up the Fabric Interconnect
	Off	There is no AC power to the power supply
Fault/error LED	Solid amber	Power supply failure that indicates an over voltage, over current, or over temperature
	Blinking amber	AC power is present, 3.3 VSB is on, and the power supply is off
	Off	Normal operation

Fan Modules

The Cisco UCS 6454 FI and the Cisco UCS 64108 FI use different fan modules.

- **Cisco UCS 6454 FI:** four fan modules. The fans support 3+1 redundancy. All fans are hot swappable but only one fan can be removed at a time.
- **Cisco UCS 64108 FI:** three fan modules. The fans support 2+1 redundancy. All fans are hot swappable but only one fan can be removed at a time.

Fabric Interconnect	Fan
Cisco UCS 6454	UCS-FAN-6332 (The Cisco UCS 6332 FI and Cisco UCS 6454 FI use the same fan modules and orderi

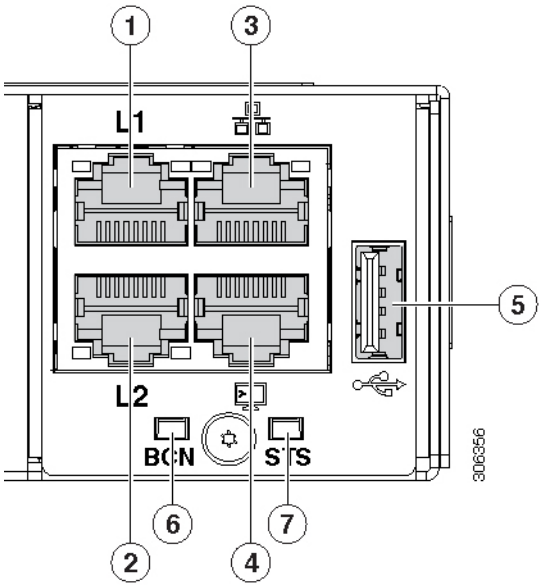
Cisco UCS 64108	UCS-FAN-64108

Front Panel Ports and LEDs

The FIs in the Cisco UCS 6400 Series have slightly different front panel port and LED placement, but the icons and functions are the same. See the following figures for placement on your FI. Also see the LED state-definition table below.

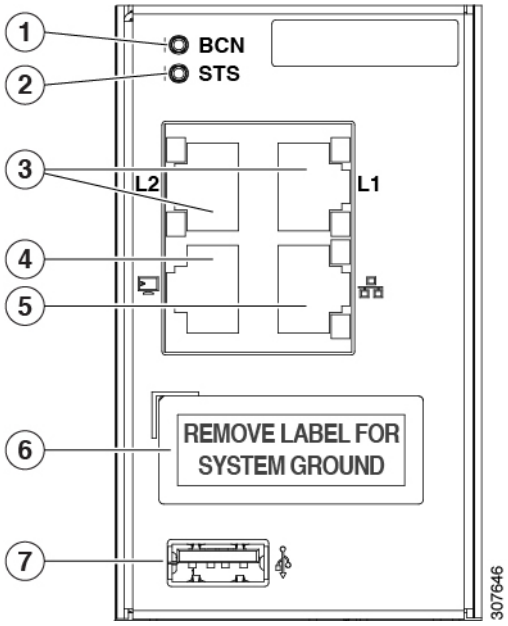
Note When connecting L1 and L2 ports between FIs, the maximum supported length of Ethernet CAT5e or CAT6 cable is 100 meters.

Figure 7: Cisco UCS 6454 FI Front Panel Ports and LEDs



1	L1 high availability port	**2**	L2 high availability port
3	RJ45 Network Management Port	**4**	RS-232 serial console port (RJ-45 connector)
5	USB port The USB port can be used for booting or downloading scripts.	**6**	Beacon LED
7	System Status LED	-	-

Figure 8: Cisco UCS 64108 FI Front Panel Ports and LEDs



1	Beacon LED	**2**	System Status LED
3	L1 and L2 high availability ports	**4**	RS-232 serial console port (RJ-45 connector)
5	Network Management Port (RJ-45)	**6**	Grounding pad for two-hole grounding lug (under protective label)
7	USB port The USB port can be used for booting or downloading scripts.	-	-

The definition of states of the beacon and system status LEDs are as follows:

LED	Location	Function	Color	State	Description
Beacon LED	Front and rear	Indicate selected chassis	Blue	Solid On	Chassis selected
				Off	Chassis not selected

LED	Location	Function	Color	State	Description
System Status LED	Front and rear	Indicate system power/health at bootup and run time	Green	Solid on	Normal operation
				Off	System powered off
			Amber	On	System fault
			Red	Solid on	Power shut down by software
				Blinking	Secure boot validation has failed

Network Management Port LEDs

The states of the LEDs of the management port on the front panel are listed below.

LED Position	LED State	Description
Left	Off	No link
	Solid green	Physical link
Right	Off	No activity
	Blinking green	Activity

L1 and L2 Port LEDs

The states of the LEDs on the L1 and L2 front-panel ports are listed below.

LED Position	LED State	Description
Left	Off	No link
Left	Solid green	Physical link
Right	Off	No activity
Right	Blinking green	Activity

Rear Panel System Environment LED

The states of the LEDs on the system environment LED on the rear panel are listed below. The system environment LED indicates a fan fault or alarm.

LED State	Description
Solid amber	Minor fan alarm (one fan is missing or there is a failure).
Solid red	Major fan alarm (two or more fans are missing or have failed, or there is a fan direction mismatch).

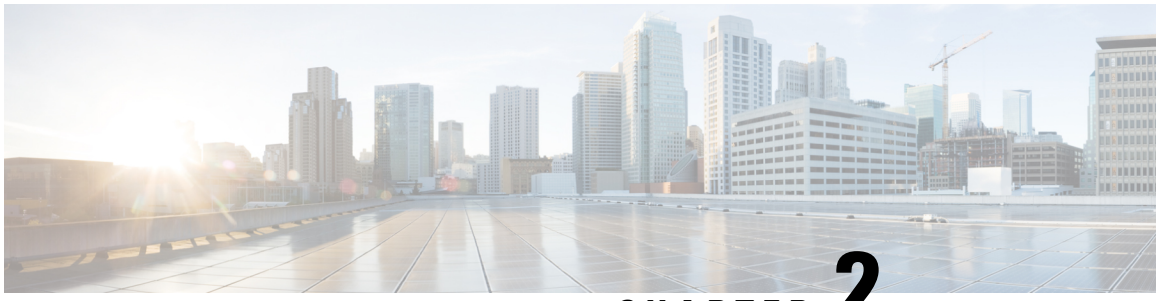
Rear Panel Port LEDs

The states of the LEDs on the rear panel ports are listed below.

LED State	Description
Yellow	Enabled, but SFP not inserted Administrative down (software shutdown)
Green	Enabled and link is up
Off	Enabled, but link is not connected
Blinking yellow	Power On Self Test (POST) failed Port beacon enabled

Supported Transceivers

For a complete list of the supported transceivers and cables with ordering PIDs, refer to the Cisco UCS Fabric Interconnect 6454 Data Sheet.



CHAPTER 2

Installing the Cisco UCS Fabric Interconnect

- Preparing for Installation, on page 13
- Cabinet and Rack Requirements, on page 16
- Establishing System Ground, on page 28

Preparing for Installation

Considerations and Warnings

Note Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for Cisco UCS* for important safety information.

Warning IMPORTANT SAFETY INSTRUCTIONS This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

Warning Only trained and qualified personnel must be allowed to install, replace, or service this equipment. Statement 1030

Note Each new fabric interconnect requires a license. For information on licensing, see the Configuration Guide for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL: Cisco UCS Manager Configuration Guides

Warning **Statement 1074 – Comply with Local and National Electrical Codes** To reduce risk of electric shock or file, installation of the equipment must comply with local and national electrical codes.

Warning **Statement 1032 – Lifting the Chassis**To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.

Warning **Statement 1006 – Chassis Warning for Rack-Mounting and Servicing**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Warning **Statement 1032 – Lifting the Chassis** To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.

Warning **Statement – 1024 – Ground Conductor**

This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Warning **Statement 1046 – Installing or Replacing the Unit**

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

Airflow Considerations

To ensure proper airflow, follow these guidelines:

- Maintain ambient airflow throughout the data center to ensure normal operation.
- Consider the heat dissipation of all equipment when determining air conditioning requirements. When evaluating airflow requirements, take into consideration that hot air generated by equipment at the bottom of the rack can be drawn in the intake ports of the equipment above.
- Ensure that exhaust airflow is unobstructed.

Fabric Interconnect Weight



Caution We recommend that you use two people or a mechanical lift when lifting the system.

- The Cisco UCS 6454 FI weighs 22.24 lbs (10.10 kg)
- The Cisco UCS 64108 FI weighs 35.86 lbs (16.27 kg)

When lifting the system, follow these guidelines:

- Disconnect all power and external cables before lifting the system.
- Ensure that your footing is solid and that the weight of the system is evenly distributed between your feet.
- Lift the system slowly, keeping your back straight. Lift with your legs, not with your back. Bend at the knees, not at the waist.

Installation Guidelines

When installing the Cisco UCS Fabric Interconnect, follow these guidelines:

- Prepare the site as described in the Site Preparation Checklist.
- Plan your site configuration and prepare the site before installing the fabric interconnect. lists the recommended site planning tasks.
- Record the information listed in Site Preparation Checklist as you install and configure the fabric interconnect.
- Ensure that there is adequate space around the fabric interconnect to allow for servicing and for adequate airflow. The Site Preparation Checklist lists airflow requirements.
- Ensure that the air conditioning meets the heat dissipation requirements listed in Site Preparation Checklist.
- Ensure that the fabric interconnect is adequately grounded. If the fabric interconnect is not mounted in a grounded rack, Cisco recommends connecting both the system ground on the fabric interconnect and the power supply ground to an earth ground.

- Ensure that the site power meets the power requirements listed in Power Specifications. If available, you can use an uninterruptible power supply (UPS) to protect against power failures.

  Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco UCS Fabric Interconnect, which can have substantial current draw fluctuations because of fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. For North America, the power supply requires a 15-A or 20-A circuit.

  To prevent loss of input power, ensure that the total maximum loads on the circuits supplying power to the fabric interconnect are within the current ratings for the wiring and breakers.

- Use the following screw torques (listed in Newton-metres) when installing the fabric interconnect:
  - Captive screws: 4 in-lb (0.45 Nm)
  - M3 screws: 4 in-lb (0.45 Nm)
  - M4 screws: 12 in-lb (1.36 Nm)
  - 10-32 screws: 20 in-lb (2.26 Nm)
  - 12-24 screws: 30 in-lb (3.39 Nm)



Note Also, note that you will use a minimum of 10 customer-required screws (typically10-32 or 12-24) which Cisco does not supply. They come with the manufacturer's rack you purchased. For torque values for these screws, consult your manufacturer's documentation.

Cabinet and Rack Requirements

This section provides the requirements for the following types of cabinets and racks, assuming an external ambient air temperature range of 0 to 104°F (0 to 40°C):

- Standard perforated cabinets (60 percent or greater perforation front and back is required; the Cisco R Series rack is an ideal choice)
- Standard open racks



Note If you are using an enclosed cabinet, we recommend one of the thermally validated types: standard perforated or solid-walled with a fan tray.



Note Do not use racks that have obstructions (such as power strips), because the obstructions could impair access to field-replaceable units (FRUs). The Cisco RP series PDUs, when mounted in a Cisco R Series Rack, does not obstruct FRU replacement.

General Requirements for Cabinets and Racks

The cabinet or rack must meet the following requirements:

- The minimum vertical rack space per Cisco UCS 6454 fabric interconnect must be one RU (rack unit), equal to 1.75 in. (4.4 cm). The minimum vertical rack space per Cisco UCS 64108 fabric interconnect must be two RUs (rack units), equal to 3.5 in. (8.8 cm).
- Standard 19 in. (48.3 cm), four-post EIA cabinet or rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992.
- The width between the rack-mounting rails must be at least 17.72 in. (45.0 cm) if the rear of the fabric interconnect is not attached to the rack. For four-post EIA racks, this is the distance between the two front rails.
- For four-post EIA cabinets (perforated):
  - The minimum spacing for the bend radius for fiber-optic cables should have the front-mounting rails of the cabinet offset from the front door by a minimum of 3 in. (7.6 cm), and a minimum of 5 in. (12.7 cm) if cable management brackets are installed on the front of the fabric interconnect.
  - The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.5 to 34.0 in. (59.7 to 86.4 cm) to allow for rear-bracket installation.
  - A minimum of 2.5 in. (6.4 cm) of clear space should exist between the side edge of the fabric interconnect and the side wall of the cabinet. No sizeable flow obstructions should be immediately in the way of fabric interconnect air intake or exhaust vents.

Requirements Specific to Perforated Cabinets

A perforated cabinet is defined here as a cabinet with perforated front and rear doors and solid side walls. In addition to the requirements listed in the General Requirements for Cabinets and Racks, on page 17, perforated cabinets must meet the following requirements:

- The front and rear doors must have at least a 60 percent open area perforation pattern, with at least 15 square inches of open area per rack unit of door height.
- The roof should be perforated with at least a 20 percent open area.
- The cabinet floor should be open or perforated to enhance cooling.

The Cisco R-Series racks meet or exceed all these requirements.

Unpacking and Inspecting the Cisco UCS Fabric Interconnect



Caution When handling fabric interconnect components, wear an ESD strap and handle modules by the carrier edges only. A grounding lug mounting point is provided on the fabric interconnect. For the grounding lug to be effective, the fabric interconnect must be grounded through the power cable, the chassis ground, or the metal-to-metal contact with a grounded rack.

Tip Optional: Keep the shipping container in case the fabric interconnect requires shipping in the future.

Note The interconnect is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

Procedure

Step 1 Compare the shipment to the equipment list provided by your customer service representative and verify that you have received all items, including the following:

- Grounding lug kit
- Rack-mount kit
- ESD wrist strap
- Cables with connectors
- Any optional items ordered

Step 2 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Required Equipment

Before beginning the installation, ensure that the following items are ready:

- Number 1 and number 2 Phillips screwdrivers with torque-measuring capability
- 3/16-inch flat-blade screwdriver
- Tape measure and level
- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

The following additional items (not found in the accessory kit) are required to ground the chassis:

- Grounding cable (6 AWG recommended), sized according to local and national installation requirements; the required length depends on the proximity of the Cisco UCS Fabric Interconnect to proper grounding facilities.
- Crimping tool large enough to accommodate girth of the lug
- Wire-stripping tool

Required Items for the Cisco UCS FI 64108

The Cisco UCS 64108 FI accessory kit (UCS-ACC-64108) comes with several items, although, not all items are required for installation. The kit comes with extra items used with other Cisco hardware.

The following figure and table identifies the items contained in the accessory kit provided with the Cisco UCS 64108 FI. All required items for installation are indicated via bold text.

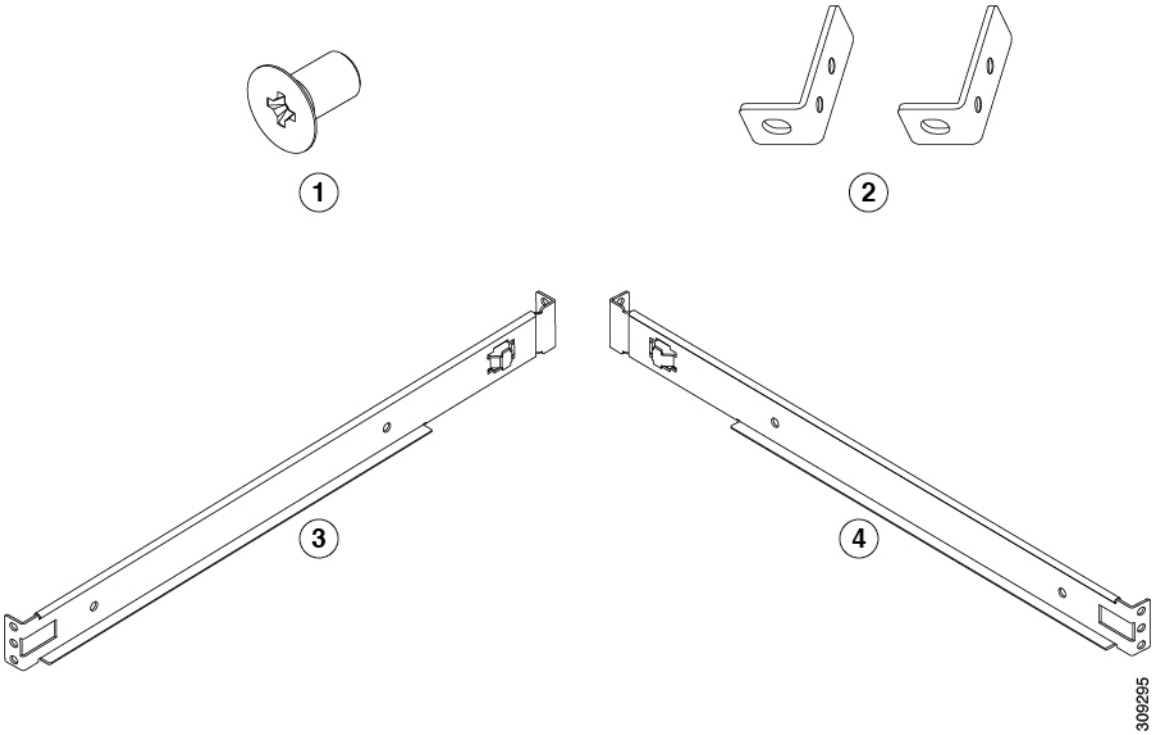


Table 2: Cisco UCS 64108 FI Accessory Kit

Required	Quantity	Unit	Part Description
	8	1	M4x0.7 x 6-mm Phillips countersink screws (For a Four-Post Rack) **Required for the UCS 64108**. 6 are required, 2 extra.
	2	2	Front-mount brackets (For a Four-Post Rack) **Required for the UCS 64108**
	1	3	Slider rail, Right (For a Four-Post Rack) **Required for the UCS 64108**

r n e e	Quantity h r u g i	N i t F	Part Description
	1	4	Slider rail, Left (For a Four-Post Rack) **Required for the UCS 64108**
-	1 kit	-	Ground lug kit • Two-hole lug (1) **Required for the UCS 64108** • M4 x 8-mm Phillips pan-head screws (two) **Required for the UCS 64108**
-	1	-	ESD wrist strap (disposable)**Required for the UCS 64108**
-	2	-	Rack-mount brackets (For a Two-Post Rack)
-		-	M4x0.7 x 7-mm Phillips countersink screws (For a Two-Post Rack)

Installing the Cisco UCS FI 6454 in a Cabinet or Rack

This section describes how to use the rack-mount kit provided to install a Cisco UCS FI 6454 into a cabinet or rack that meets the requirements described in Cabinet and Rack Requirements, on page 16.

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

This table lists the items contained in the rack-mount kit (UCS-ACC-6332) provided with the Cisco UCS FI 6454.

Table 3: Cisco UCS FI 6454 Fabric Interconnect Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
2	M4x0.7x8mm Phillips countersink screws
16	M4x0.7x7mm Phillips countersink screws
2	Rack-mount guides
2	Slider rails

Procedure

Step 1 Install the front rack-mount brackets as follows:

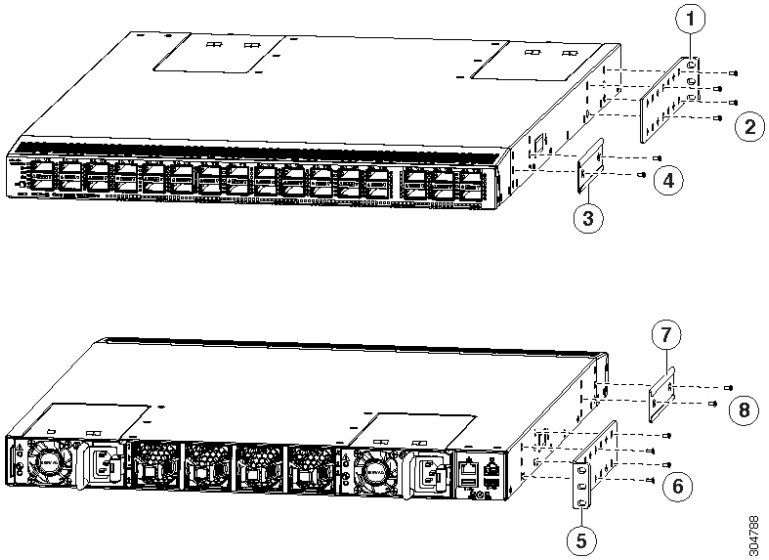
a) Position a front rack-mount bracket against the FI and align the screw holes as shown below. You can attach the front rack-mount bracket at the front (fan side) or the rear (port side) of the FI, depending on which side you want to locate on the cold aisle.

Note
You can align any four of the holes in the front rack-mount bracket to four of the six screw holes on the side of the FI. The holes that you use depend on the requirements of your rack and the amount of clearance required for interface cables and power supply handles.

b) Attach the front rack-mount bracket to the FI with four M4 screws.
c) Repeat Step 1 for the front rack-mount bracket on the opposite side of the chassis.

The following figure shows two alternate ways to mount the brackets, depending on which side you want to locate on the cold aisle.

Figure 9: Attaching the Rack-Mount Brackets to the FI



1	Front rack-mount bracket aligned to the rear of the FI	2	Four M4x0.7 x 7-mm screws used to attach the front bracket
3	Rear rack-mount guide aligned to the front of the FI	4	Two M4x0.7 x 7-mm screws used to attach the rear bracket
5	Alternate mounting: Front rack-mount bracket aligned to the front of the FI	6	Four M4x0.7 x 7-mm screws used to attach the front bracket
7	Alternate mounting: Rear rack-mount guide aligned to the rear of the FI	8	Two M4x0.7 x 7-mm screws used to attach the rear bracket

Step 2 Install the rear rack-mount guides onto the chassis as follows:

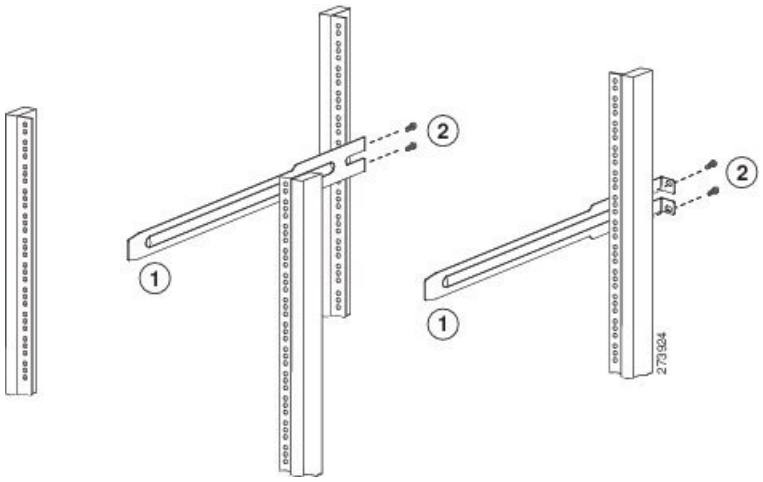
a) Align the two screw holes on a rear rack-mount guide to the middle two screw holes of the remaining six screw holes on a side of the chassis. If you are aligning the guide to holes that are near the front (fan side) of the chassis, see callout 3 in the previous figure. If you are aligning the guide to holes that are near the rear (port side) of the chassis, see callout 7 in the previous figure.
b) Attach the bracket to the chassis with two of the flat-head M4 screws. See callout 4 or 8 in the previous figure.

c) Repeat Step 2 with the rear rack-mount bracket on the other side of the chassis.

Step 3 Attach the slider rails to the rack. Use 2 customer-supplied 12-24 screws or 2 10-32 screws, depending on the rack rail thread type. Cisco recommends use for this kit is based on your rack. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.

a) Repeat with the slider rail on the opposite side of the rack.
b) Use a tape measure and level to verify that the rails are horizontal and at the same height.

Figure 10: Installing the Slider Rails

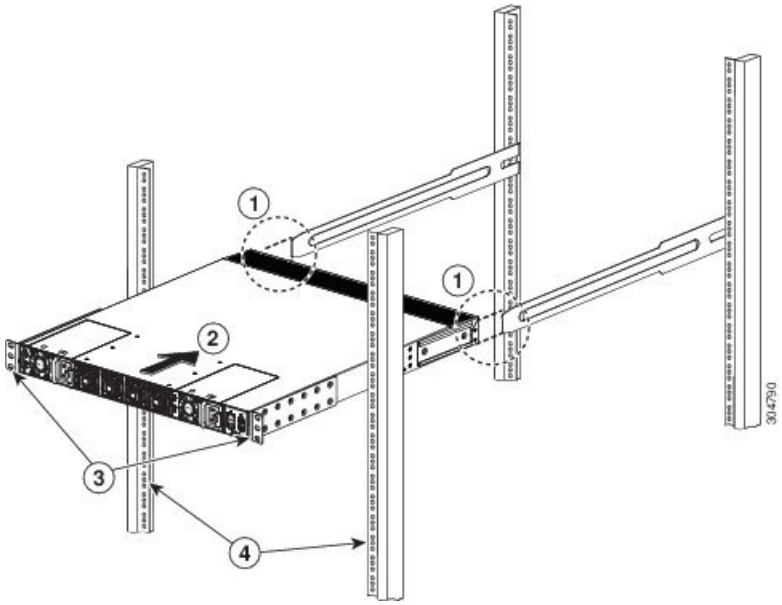


Step 4 Insert the FI into the rack:

Note
The UCS 6454 FI weighs 22 lb (9.97 kg) when fully loaded with components. The Cisco UCS 64108 FI weighs 27.4 pounds (12.4 kg) when fully loaded with components.

a) Supporting both sides of the FI, position the two rear rack-mount guides on the chassis between the two posts that do not have slider rails attached to them (see the following figure).
b) Align the two rear rack-mount guides on either side of the chassis with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the chassis all the way into the rack. If the chassis does not slide easily, try realigning the rack-mount guides on the slider rails.

Figure 11: Sliding the FI Into the Rack

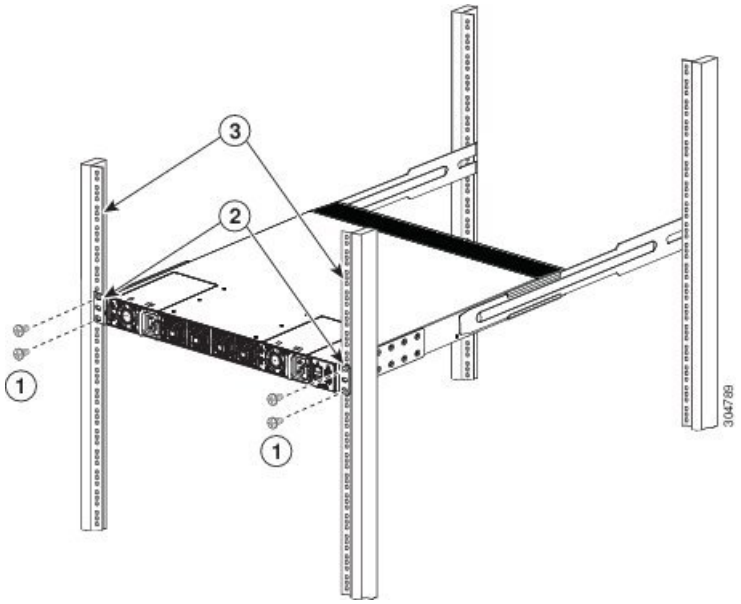


Step 5 Stabilize the chassis in the rack by attaching the front rack-mount brackets to the front rack posts:

a) Insert 2 screws (12-24 or 10-32, depending on rack type) through the front rack-mount brackets and into the threaded holes in the rack post.

b) Repeat for the front rack-mount bracket on the opposite rack post.

Figure 12: Attaching the Front Rack-Mount Brackets to the Rack Posts



Installing the Cisco UCS 64108 FI in a Cabinet or a Rack

This section describes how to use the UCS-ACC-64108 accessory kit provided to install a Cisco UCS 64108 FI into a cabinet or four-post rack. This kit contains items for both the Cisco UCS 64108 FI and other Cisco hardware. Check Required Items for the Cisco UCS FI 64108, on page 19 to verify you have the necessary items to proceed with the installation. This table lists the items contained in the rack-mount kit provided with the Cisco UCS 64108 FI. For warnings, see Considerations and Warnings, on page 13.

The chassis that you are installing ships with two adjustable bottom-support rails that you can attach to a cabinet or four-post rack to hold the chassis. Each of these bottom-support rails has two pieces—one that slides into the other so that you can adjust them to fit racks with front and rear mounting posts that are spaced less than 36 inches (91 cm). On each bottom-support rail, the rail half that slides into the other rail includes a chassis stop that fits into the module end of the chassis.

You need to slide the chassis onto the bottom-support rails so that the power supply end locks onto the chassis stops at the end of the rails and so that the front-mount brackets on the chassis come into contact with the front-mount rails on the rack.

Before you begin

Before you can install the bottom support rails for the chassis, check the following:

- Check to make sure you have the required items to proceed with the installation. See Required Items for the Cisco UCS FI 64108, on page 19.
- Verify that a four-post rack or cabinet is installed.
- If any other devices are stored in the rack or cabinet, verify that the heavier ones are installed below lighter devices.
- Verify that the bottom-support rails kit is included in the accessory kit.
- Gather the customer-supplied 10 screws for attaching the bottom support brackets to the racks (typically 10-32 or 12-24 screws) or the screw appropriate for the vertical mounting rails on the rack. Note that the rack screws may be a different mm size than the kit screws.
- You must have a manual Phillips-head torque screwdriver.
- You need (2) front-mount brackets and M4 x 6 mm screws (4) found inside the accessory kit.

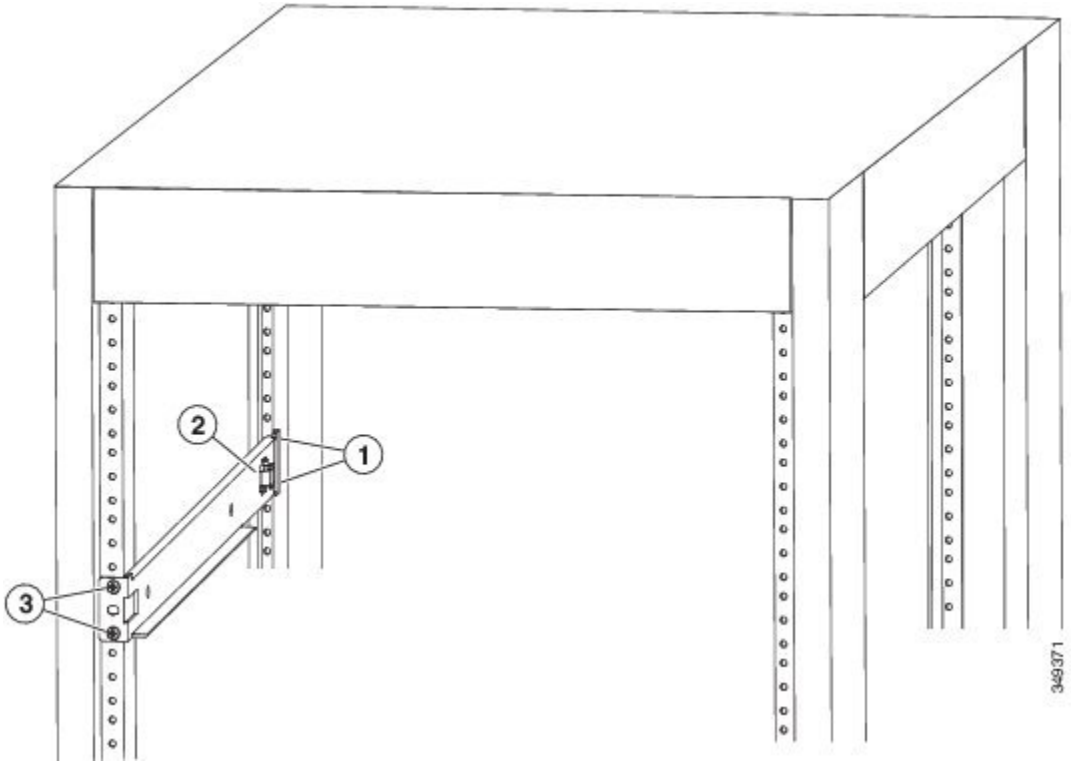
Procedure

Step 1 Look at the fan and power supply modules installed in the chassis to determine how you must position the bottom-support rails on the rack. Position the bottom support rails so that the chassis stop is positioned by the cold aisle.

Step 2 Separate the two sliders that make up one bottom-support rail and position the half with the chassis stop by the appropriate aisle for the fan and power supply modules. Also make sure that there is at least 1 rack unit open above the bottom-support rails so that you can easily install the chassis.

Step 3 Use two customer-supplied screws (typically 10-32 or 12-24 screws) to attach the bottom-support rail half to the vertical mounting rails on the rack post. Tighten each screw to the appropriate torque setting for the screws (for 10-32 or 12-24 screws, use 40 in. lbs [4.5 N·m] of torque).

Step 4 Slide the other half of the bottom-support rail onto the attached half of the rail set and use two customer supplied screws (typically 10-32 or 12-24 screws) to secure that portion to the vertical mounting rails on the rack. Tighten each screw to the appropriate torque setting for the screws (for 10 - 32 or 12 -24 screws, use 40 in. lbs [4.5 N·m] of torque).



1	Two screws holding one end of the bottom-support bracket to the rear of the rack
2	Chassis stop on the expanding bottom-support bracket
3	Two screws holding the front end of the bottom-support bracket to the front side of the rack

Step 5 Repeat Steps 2 through 4 to attach the other expanding bottom-support rails to the other side of the rack.

What to do next

You are ready to attach the front-mount brackets to the chassis. See Attaching Front-Mount Brackets to the Cisco UCS 64108 FI Chassis, on page 25.

Attaching Front-Mount Brackets to the Cisco UCS 64108 FI Chassis

This section explains how to attach front-mount brackets to the chassis. You need to attach a right-angled bracket to each side of the chassis. This bracket holds the chassis in place on a four-post rack.

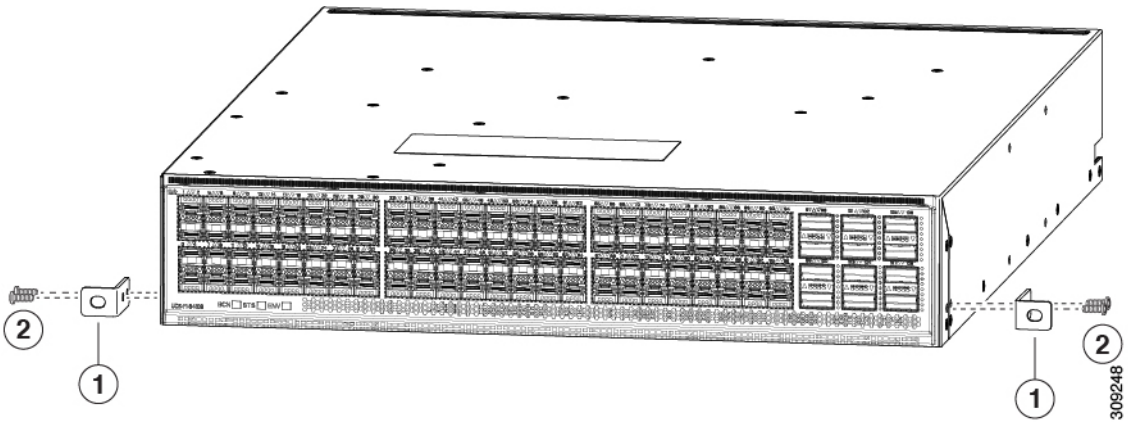
Before you begin

You must have the following tools and equipment:

- Manual Phillips-head torque screwdriver
- Two Front-mount brackets and M4 x 6 mm screws (4) found inside the accessory kit)

Procedure

Step 1 Align the two holes in one side of one of two front-mount brackets to two holes on the left or right side of the chassis (see the following figure). Be sure the other side of the bracket faces toward the front (port end) of the chassis.



1	Front-mount bracket with two screw holes aligned to two screw holes in the chassis and one screw hole facing the front (port side) of the chassis.
2	Two M4 x 6 mm screws used to fasten the bracket to the chassis.

Step 2 Use two M4 x 6 mm screws to attach the bracket to the chassis. Tighten each screw to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 3 Repeat Steps 1 and 2 to attach the second center-mount bracket to the other side of the chassis.

What to do next

You are ready to mount the chassis to the four-post rack. See Installing the Cisco UCS 64108 FI Chassis in a Four-Post Rack, on page 26.

Installing the Cisco UCS 64108 FI Chassis in a Four-Post Rack

This task explains how to mount the chassis to a cabinet or four-post rack.

Before you begin

- Make sure the four-post rack is properly installed and secured to the concrete subfloor.
- Make sure the bottom-support rails are installed so that the fan modules are positioned in a cold aisle (the chassis stop on the bottom-support rails is positioned by the cold aisle).
- Make sure that two front-mount brackets are securely fastened to the sides of the chassis at the port end.

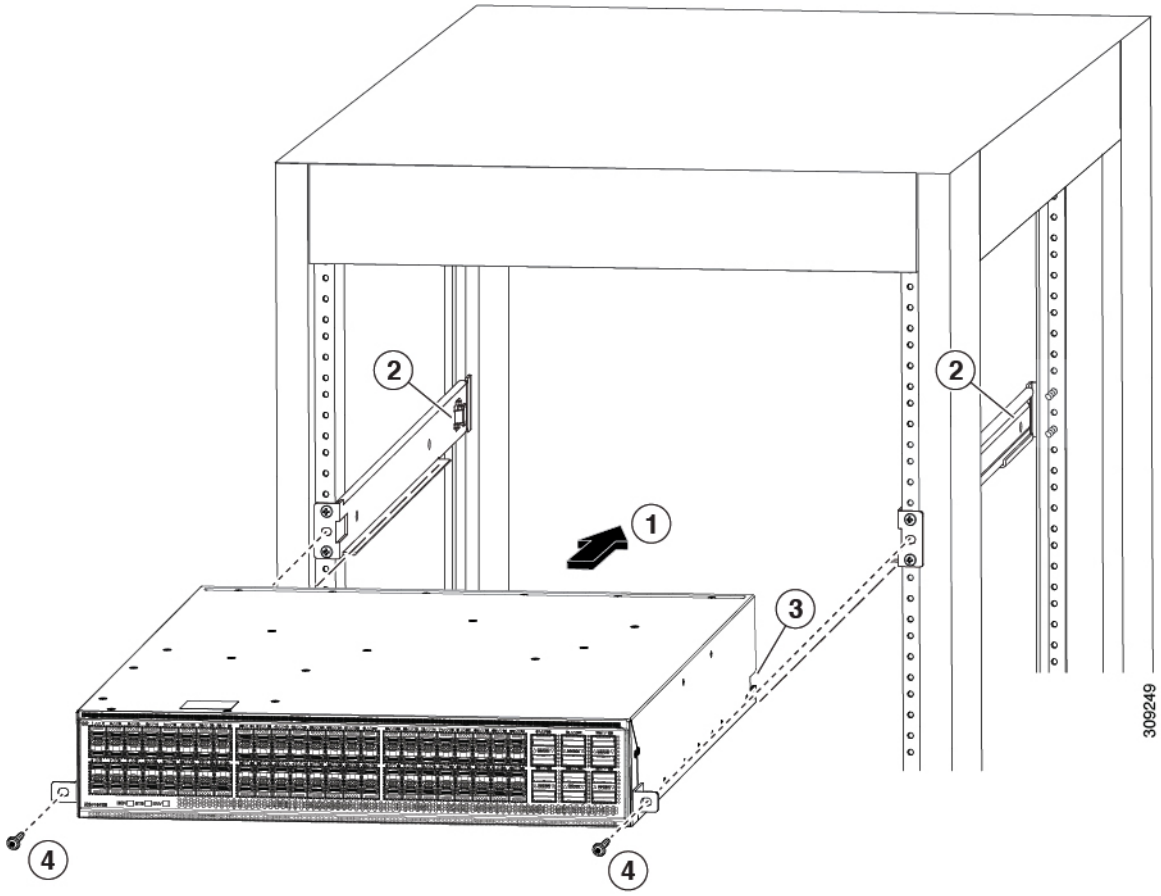
- Make sure that you have two customer-supplied rack-mount screws (10-32 or 12-24 or appropriate screw for the vertical mounting rails on the rack).

Procedure

Step 1 Slide the power supply end of the chassis onto the bottom-support rails that are installed on the rack as shown in callout 1 in the figure.

Be sure that the sides of the chassis by the power supplies clip into the chassis stops on the bottom-support rails and the front-mount brackets come in contact with the rack (see the following figure).

Note
If the bottom-support rails are extended a long distance, they can bend outwards slightly when you install the chassis and the chassis stops at the far end of the rails might not fit into the end of the chassis. If this happens, press the side rails toward the sides of the chassis so that the chassis stops can go inside the chassis and hold it in place on the rack.



2	Chassis stops for holding the chassis (positioned by the aisle required for the fan and power supply modules).

3	Receiving hole on each side of the chassis for the chassis stops on the bottom-support rails.
4	6 customer-supplied rack-mount screws (10-32 or 12-24 screw or other screw appropriate for the rack) used to secure each side of the chassis to the rack.

Step 2 Use a customer-supplied rack-mount screw (a 10-32 or 12-24 screw or other appropriate screw for the rack) to attach each of the two mounting brackets on the chassis to the rack and tighten each screw to the appropriate torque setting for the screw (for 10-32 or 12-24 screws, use 40 in-lbs [4.5 N·m] of torque).

What to do next

You are ready to establish system ground. See Grounding the Cisco UCS 64108 Fabric Interconnect, on page 31.

Establishing System Ground

The system ground is referred to as the network equipment building system (NEBS) ground. You must use the NEBS ground on AC-powered systems if you are installing this equipment in a U.S. or European Central Office.

The NEBS ground provides additional grounding for EMI shielding requirements and grounding for the low-voltage supplies (DC-DC converters) on the modules, and is intended to satisfy the Telcordia Technologies NEBS requirements for supplemental bonding and grounding connections. You must observe the following system grounding guidelines for your chassis:

- You must install the NEBS ground connection with any other rack or system power ground connections that you make. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You must connect both the NEBS ground connection and the power supply ground connection to an earth ground. The NEBS ground connection is required if this equipment is installed in a U.S. or European Central Office.

Proper Grounding Practices

Grounding is one of the most important parts of equipment installation. When you properly ground systems during installation, you reduce or prevent shock hazards, equipment damage due to transients, and data corruption.

Note In all situations, grounding practices must comply with local National Electric Code (NEC) requirements or local laws and regulations.

Table 4: Proper Grounding Guidelines

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
Commercial building is subjected to direct lightning strikes. For example, some places in the United States, such as Florida, are subject to more lightning strikes than are other areas.	High	All lightning protection devices must be installed in strict accordance with manufacturer recommendations. Conductors carrying lightning current should be spaced away from power and data lines in accordance with applicable recommendations and codes. Best grounding recommendations must be closely followed.
Commercial building is located in an area where lightning storms frequently occur but is not subject to direct lightning strikes.	High	Best grounding recommendations must be closely followed.
Commercial building contains a mix of information technology equipment and industrial equipment, such as welding.	Medium to high	Best grounding recommendations must be closely followed.
Existing commercial building is not subject to natural environmental noise or man made industrial noise. This building contains a standard office environment. This installation has a history of malfunction due to electromagnetic noise.	Medium	Determine source and cause of noise if possible, and mitigate as closely as possible at the noise source or reduce coupling from the noise source to the affected equipment. Best grounding recommendations must be closely followed.
New commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system in a new building is often the least expensive route and the best way to plan for the future. Best grounding recommendations should be followed as closely as possible.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system is always recommended. Best grounding recommendations should be followed as much as possible.

Grounding the Cisco UCS 6454 Fabric Interconnect

The fabric interconnect has a grounding pad with two threaded M4 holes for attaching a grounding lug. The following are guidelines for grounding the fabric interconnect.

Warning When installing or replacing the unit, the ground connection must always be made first and disconnected last. [Statement 1046]

Warning The plug-socket combination must be accessible at all times, because it serves as the main disconnecting device. [Statement 1019]

- We recommend grounding the fabric interconnect, even if the rack is already grounded.
- All power supplies must be grounded. The receptacles of the AC power cables used to provide power to the fabric interconnect must be the grounding type, and the grounding conductors should connect to protective earth ground at the service equipment.
- Grounding the fabric interconnect is required if you are using DC power supplies, even if the rack is already grounded. A grounding pad with two threaded M4 holes is provided on the fabric interconnect for attaching a grounding lug. The ground lug must be NRTL listed. In addition, the copper conductor (wires) must be used and the copper conductor must comply with NEC code.

Procedure

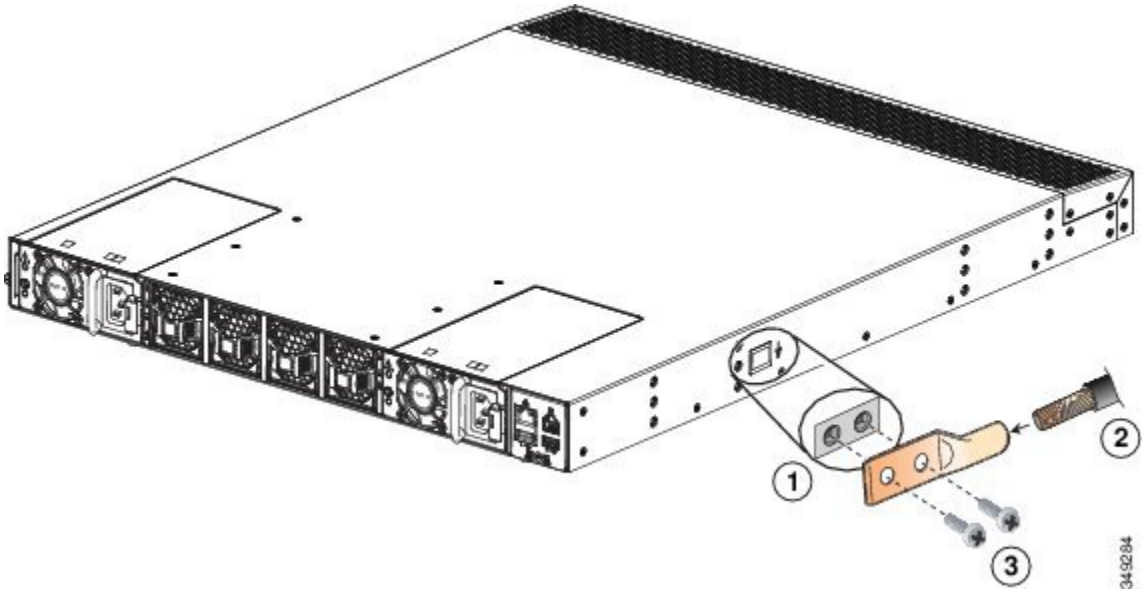
Step 1 Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the grounding cable.

Step 2 Insert the stripped end of the grounding cable into the open end of the grounding lug.

Step 3 Use the crimping tool to secure the grounding cable in the grounding lug.

Step 4 Remove the adhesive label from the grounding pad on the fabric interconnect.

Figure 13: Connecting the System Ground (Cisco UCS 6454 FI shown)



1	Grounding pad on FI, with two M4-threaded screw holes (enlarged view shown)	2	Stripped copper wire
3	M4 screws (two)	-	-

Step 5 Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the two M4 screws through the holes in the grounding lug and into the grounding pad.

Step 6 Ensure that the lug and cable do not interfere with other equipment.

Step 7 Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

Grounding the Cisco UCS 64108 Fabric Interconnect

The chassis is automatically grounded when you properly install the FI in a grounded rack with metal-to-metal connections between the chassis and rack.

You can also ground the chassis, which is required if the rack is not grounded, by attaching a customer-supplied grounding cable. Attach the cable to the chassis grounding pad and the facility ground.

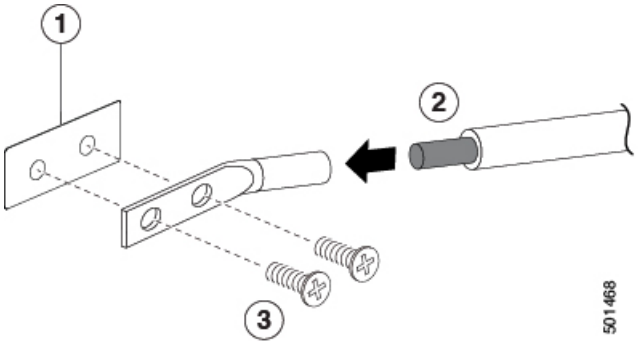
Before you begin

- Before you can ground the chassis, you must have a connection to the earth ground for the data center building.
- Ensure you have the proper grounding cable and grounding wire as appropriate for you country or region.

Procedure

Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire. We recommend 6-AWG wire for the U.S. installations.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug. The grounding lug is on the front plate of the FI. To identify the location of the grounding lug, see Figure 4: Cisco UCS 64108 Fabric Interconnect Front View, on page 4. Use a crimping tool to crimp the lug to the wire, see the following figure. Verify that the ground wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug.



1	Chassis grounding pad. Remove the grounding pad to connect the grounding wire to the port covered by the pad. For detail on the location of the grounding pad and lug, see Cisco UCS 64108 Fabric Interconnect, on page 3.
2	Grounding cable, with 0.75 in. (19 mm) of insulation that is stripped from one end, which is inserted into the grounding lug and crimped in place
3	Two M4 screws are used to secure the grounding lug to the chassis

Step 3 Secure the grounding lug to the chassis grounding pad with two M4 screws, see the previous figure. Tighten the screws to 11 to 15 in-lb (1.2 to 1.7 N·m) of torque.

Step 4 Prepare the other end of the grounding wire and connect it to the facility ground.

Starting the System

Note Do not connect the Ethernet port to the LAN until the initial system configuration has been performed. For instructions on configuring the system, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at this URL: http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html

Procedure

Step 1 Verify that the power supply and the fan modules are installed.

Note
Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco UCS Fabric Interconnect to your outlet receptacle. See *Cabinet Jumper Power Cords*.

Step 2 Ensure that the chassis is adequately grounded, and that the AC or DC power available has the required power voltages (see *Power Specifications*). For a DC installation, see Wiring a *DC Power Connector* to correctly wire the DC connector before applying a DC cable.

Step 3 For a first-time installation, you will need to work with your network manager to determine the following parameters:

- System name
- Password for the admin account. Choose a strong password that meets the guidelines for Cisco UCS Manager passwords. This password can not be blank.
- Management port IP address and subnet mask
- Default gateway IP address
- DNS server IP address (optional)
- Domain name for the system (optional)

Step 4 Connect a PC or laptop directly to the local console port of the primary or standalone fabric interconnect. In a cluster configuration, the primary is the fabric interconnect that powers up first.

The console port on the terminal should be set to 9600 baud, 8 data bits, no parity, 1 stop bit.

Step 5 If the fabric interconnect will be running in a cluster with another fabric interconnect, connect Ethernet cables between the L1 and L2 ports. Connect Port L1 on fabric interconnect A to L1 on fabric interconnect B. Connect Port L2 on fabric interconnect A to L2 on fabric interconnect B.

If the fabric interconnect and the UCS instance will be in standalone mode, this step is not necessary.

Step 6 Connect the power cable to a power source. The system should power on as soon as you connect the cable.

Step 7 After the system boots, verify that the LED operation is as follows:

- Fan modules—Status LED is green.
- Power supplies—Status LED is green.
- After initialization, the system status LED is green, indicating that all chassis environmental monitors are reporting that the system is operational. If this LED is orange or red, then at least one environmental monitor is reporting a problem.

Note
The link LEDs for the Fibre Channel ports remain yellow until the ports are enabled, and the LED for an Ethernet connector port remains off until the port is connected.

Step 8 If there is a problem, try removing and reinstalling a component that is not operating correctly. If it still does not operate correctly, contact your customer service representative for a replacement.

Note
If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

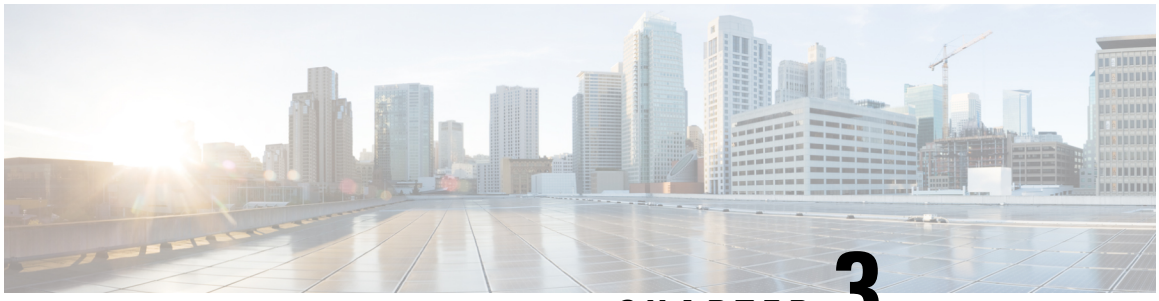
Step 9 Verify that the system software has booted and that the system has initialized without error messages.

If you cannot resolve an issue, contact your customer service representative.

Step 10 Complete the worksheets provided in *Site Preparation Checklist* for future reference.

Step 11 Configure the primary fabric interconnect as described in thr *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at this URL: http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html

Step 12 Repeat this procedure for the secondary fabric interconnect.



CHAPTER 3

Connecting the Cisco UCS Fabric Interconnect

- Preparing for Network Connections, on page 35
- Connecting to the Console Port, on page 35
- Connecting the Management Port, on page 37
- Connecting to an SFP28 Ethernet or Fibre Channel Port, on page 37
- Maintaining SFP28 Transceivers and Fiber-Optic Cables, on page 40
- Considerations and Warnings, on page 40

Preparing for Network Connections

The Cisco UCS Fabric Interconnect provides the following types of ports:

- RS-232 local console port to create a local management connection.
- Ethernet ports, encrypted and unencrypted, to connect to a LAN.
- Fibre Channel ports to connect to a SAN.

When preparing your site for network connections to the Cisco UCS Fabric Interconnect, consider the following for each type of interface, and gather all the required equipment before connecting the ports:

- Cabling required for each interface type
- Distance limitations for each signal type
- Additional interface equipment required

Connecting to the Console Port



Caution You can connect the console port to a modem. If you do not connect it to a modem, connect it either before powering on the system or after the system has completed the boot process.

The console port on a Cisco UCS fabric interconnect provides an RS-232 serial connection over an RJ-45 interface. This interface can be used for the following tasks:

- Perform initial setup on a newly installed system that does not yet have other connectivity options

- Perform software recovery tasks when other connectivity is unavailable
- Monitor network statistics and errors
- Configure SNMP agent parameters
- Download software updates

Any device connected to this port must be capable of asynchronous transmission.

Before you begin

You may have to acquire some or all of the following:

- The Cisco serial console management cable.
- A USB to DB9 serial adapter and any drivers the adapter requires.
- Terminal emulation software such as PuTTY, HyperTerminal or Procomm Plus.
- A computer that can support VT100 terminal emulation.

Procedure

Step 1 Plug the RJ-45 end of the serial management cable into the console port on the fabric interconnect, and connect the DB-9 male end into the serial port on a laptop or other computer.

If the computer you will use does not have a serial port, you will need to use the Serial to USB adapter. Be sure to install the drivers for your adapter.

Step 2 Start your terminal software.

Step 3 Configure the terminal software as follows:

- The COM port for the connection you are about to establish is the connection to the fabric interconnect. You may need to look in the computer's device manager to confirm this.
- The other connection parameters are 9600 baud, 8 data bits, no parity, 1 stop bit.

Step 4 Use the terminal software's command to open the connection to the fabric interconnect.

A session window will start and you will see one of the following prompts:

```
loader>
```

or

```
switch(boot)#
```

or

```
FI-A(local-mgmt)#
```

You now have terminal access. Depending on the prompt, you may have all Cisco UCS Manager CLI commands or a very abbreviated set of configuration commands.

Connecting the Management Port

Caution To prevent an IP address conflict, do not connect the management port to the network until the initial configuration is complete. For configuration instructions, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at this URL: http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html

The Ethernet management connector port has an RJ-45 interface that will connect to a switch or router.

Procedure

Step 1 Connect the appropriate modular cable to the Ethernet management connector port:

- Use modular, RJ-45, straight-through UTP cables to connect the port to an Ethernet switch or hub.
- Use a cross-over cable to connect to a router interface.

Step 2 Connect the other end of the cable to the device.

Connecting to an SFP28 Ethernet or Fibre Channel Port

Installing or Removing Cables into SFP Transceivers

Caution To prevent damage to the fiber-optic cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch if there is no tension in the cable, or 2 inches if there is tension in the cable.

Installing a Transceiver

Use an SFP28 transceiver to connect to an Ethernet or Fibre Channel port.

Procedure

Step 1 Attach an ESD wrist strap and follow the instructions for its use.

Step 2 Remove the dust cover from the port cage.

Step 3 Remove the dust cover from the port end of the transceiver.

Step 4 Insert the transceiver into the port:

- If the transceiver has a Mylar tab, position the transceiver with the tab on the bottom, and then gently insert the transceiver into the port until it clicks into place.
- If the transceiver has a bale clasp, position the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.
- If the transceiver does not install easily, ensure that it is correctly positioned and the tab or clasp are in the correct position before continuing.

Note
If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Removing a Transceiver

Use an SFP28 transceiver to connect to an Ethernet or Fibre Channel port.



Caution Excessively installing and removing an SFP or SFP28 transceiver can shorten its life. Do not remove and install transceivers unless it is absolutely necessary. We recommend disconnecting cables before installing or removing transceivers to prevent damage to the cable or transceiver.

Procedure

Step 1 Attach an ESD wrist strap and follow the instructions for its use.

Step 2 If a cable is installed in the transceiver:

a) Record the cable and port connections for later reference.
b) Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.
c) Insert a dust plug into the cable end of the transceiver.

If the transceiver does not remove easily in the next step, push the transceiver completely in and then ensure that the latch is in the correct position before continuing.

Step 3 Remove the transceiver from the port:

- If the transceiver has a Mylar tab latch, gently pull the tab straight out (do not twist), and then pull the transceiver out of the port.
- If the transceiver has a bale clasp latch, open the clasp by pressing it downwards, and then pull the transceiver out of the port.

Note
If you cannot remove the SFP28 transceiver, reseat it by returning the bale clasp to the up position. Press the SFP28 transceiver inward and upward into the cage. Next, lower the bale clasp and pull the SFP28 transceiver straight out with a slight upward lifting force. Be careful not to damage the port cage during this process.

Step 4 Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static shielding bag if you plan to return it to the factory.

Step 5 If another transceiver is not being installed, protect the optical cage by inserting a clean cover.

Installing or Removing Cables into SFP28 Trancsceivers

Installing a Cable into an SFP28 Transceiver

Caution To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

Procedure

Step 1 Attach an ESD wrist strap and follow the instructions for its use.

Step 2 Remove the dust cover from the connector on the cable.

Step 3 Remove the dust cover from the cable end of the transceiver.

Step 4 Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place.

If the cable does not install easily, ensure that it is correctly positioned before continuing.

For instructions on verifying connectivity, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at this URL: http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html

Removing a Cable from a Transceiver

Caution To prevent damage to the copper cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch if there is no tension in the cable, or 2 inches if there is tension in the cable.

Caution When pulling a cable from a transceiver, grip the body of the connector. Do not pull on the jacket sleeve, because this action can compromise the fiber-optic termination in the connector.

Caution If the cable cannot be easily removed, ensure that any latch present on the cable has been released before continuing.

Procedure

Step 1 Attach an ESD wrist strap and follow the instructions for its use.

Step 2 Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.

Step 3 Insert a dust plug into the cable end of the transceiver.

Step 4 Insert a dust plug onto the end of the cable.

Maintaining SFP28 Transceivers and Fiber-Optic Cables

SFP28, SFP+ transceivers, and fiber-optic cables must be kept clean and dust-free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be kept below 0.35 dB.

Consider the following maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD wrist strap that is connected to the chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and installation can shorten its useful life.
- Keep all optical connections covered when not in use. If they become dusty, clean before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch ends of connectors, ensuring that they remain free of fingerprints and other contamination.
- Clean regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or are accidentally touched. Both wet and dry cleaning techniques can be effective. Refer to fiber-optic cleaning procedures for your site.
- Inspect routinely for dust and damage. If damage is suspected, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

Considerations and Warnings



Note Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information for Cisco UCS* for important safety information.

Warning IMPORTANT SAFETY INSTRUCTIONS This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Warning This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. Statement 1017

Warning Only trained and qualified personnel must be allowed to install, replace, or service this equipment. Statement 1030

Note Each new fabric interconnect requires a license. For information on licensing, see the Configuration Guide for the version of Cisco UCS Manager that you are using. The configuration guides are available at the following URL: Cisco UCS Manager Configuration Guides

Warning **Statement 1074 – Comply with Local and National Electrical Codes** To reduce risk of electric shock or file, installation of the equipment must comply with local and national electrical codes.

Warning **Statement 1032 – Lifting the Chassis**To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.

Warning **Statement 1006 – Chassis Warning for Rack-Mounting and Servicing**

To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

Warning **Statement 1032 – Lifting the Chassis** To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules (such as power supplies, fans, or cards); these types of handles are not designed to support the weight of the unit.

Warning **Statement – 1024 – Ground Conductor**

This equipment must be grounded. To reduce the risk of electric shock, never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Warning **Statement 1046 – Installing or Replacing the Unit**

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

Unpacking and Inspecting the Cisco UCS Fabric Interconnect

Caution When handling fabric interconnect components, wear an ESD strap and handle modules by the carrier edges only. A grounding lug mounting point is provided on the fabric interconnect. For the grounding lug to be effective, the fabric interconnect must be grounded through the power cable, the chassis ground, or the metal-to-metal contact with a grounded rack.

Tip Optional: Keep the shipping container in case the fabric interconnect requires shipping in the future.

Note The interconnect is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

Procedure

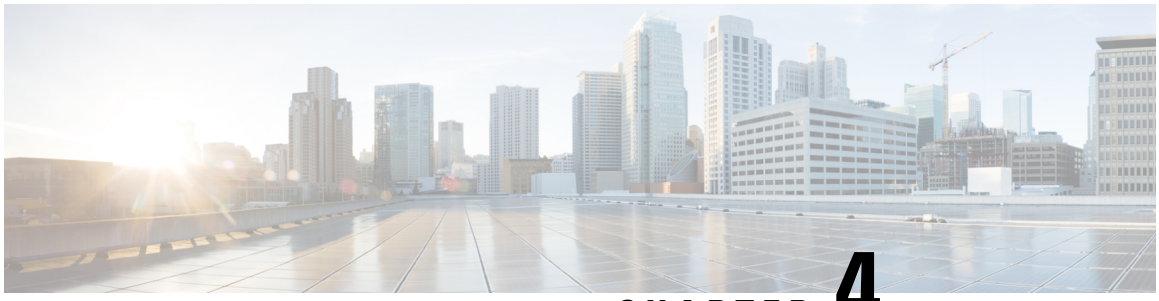
Step 1 Compare the shipment to the equipment list provided by your customer service representative and verify that you have received all items, including the following:

- Grounding lug kit
- Rack-mount kit
- ESD wrist strap

- Cables with connectors
- Any optional items ordered

Step 2 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

- Invoice number of shipper (see packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation



CHAPTER 4

Replacing the Fabric Interconnect and Components

- Replacing Fabric Interconnects, on page 45
- Replacing Components, on page 50

Replacing Fabric Interconnects

Preparing a Fabric Interconnect for Removal

Removing a subordinate (standby) fabric interconnect is non-disruptive in a redundant, high-availability Cisco UCS configuration. Removing a primary (active) fabric interconnect will cause the standby fabric interconnect to become active with minimal or no disruption.

When powering down and removing clustered fabric interconnects, remove the subordinate fabric interconnect first, and then remove the primary fabric interconnect.

Caution Be aware that if you remove both the primary and subordinate fabric interconnects, or the single fabric interconnect from a standalone system, you are shutting down the entire Cisco UCS domain.

Procedure

Step 1 Use Cisco UCS Manager to perform the following tasks:

a) Back up your Cisco UCS Manager configuration.
b) Shut down the OS on all servers in the Cisco UCS domain.
c) Disable the Smart Call Home feature in the Cisco UCS domain.
d) Decommission every attached chassis in the Cisco UCS domain.

For details, see the *Configuration Guide* for the version of Cisco UCS Manager that you are using. The configuration guides are available at this URL: http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html.

Step 2 Power down every attached chassis as described in the Cisco UCS 5108 Server Chassis Hardware Installation Guide.

Shutting Down a Fabric Interconnect

Use the following procedure when you need to replace a single fabric interconnect with the same model of fabric interconnect.

Use Cisco UCS Manager, either the GUI or the CLI, to perform the software-related tasks mentioned in the following procedure. For additional information, refer to the *Cisco UCS Manager Getting Started Guide*, the *Cisco UCS Manager Infrastructure Management Guide*, and the instructional videos available at this URL: http://www.cisco.com/c/en/us/support/servers-unified-computing/ucs-manager/products-installation-and-configuration-guides-list.html

As a best practice, perform a full configuration backup before replacing the fabric interconnect.



Note Verify that all vNICs are either redundant or that the fabric failover is enabled.

Procedure

Step 1 Contact Cisco TAC or your Cisco Sales representative to have them transfer the license to the replacement fabric interconnect.

Step 2 Label the ports and the cables that you using so that you can refer to this information later. The cabling and port numbering should be same for the replacement fabric interconnect.

Step 3 Log into UCS Manager and verify the state of the A and B fabric interconnects, either UP or DOWN. From the CLI, enter the **show cluster extended-state** command. High availability should be running in UCS Manager, as indicated by HA is READY.

Example:

```
FI-A# show cluster extended-state
Cluster Id: 0x537d0580bf9911e0-0x8955000decd07984

A: UP, PRIMARY
B: UP, SUBORDINATE

A: memb state UP, lead state PRIMARY, mgmt services state: UP
B: memb state UP, lead state SUBORDINATE, mgmt services state: UP
   heartbeat state PRIMARY_OK

INTERNAL NETWORK INTERFACES:
eth1, UP
eth2, UP

HA READY   <<<<<<<<<<<<<←---------------- HA is READY
Detailed state of the device selected for HA storage:
Chassis 1, serial: FOX1344G1R1, state: active
Chassis 2, serial: FOX1318GDKR, state: active
FI-A#
```

Step 4 Back up the software configuration.

Step 5 Use the fabric evacuation procedure on the subordinate fabric interconnect to ensure there is no data traffic impact during the hardware replacement.

Step 6 Power down the subordinate fabric interconnect by unplugging it from the power source.

Example:

```
FI-A# show cluster extended-state
Cluster Id: 0x537d0580bf9911e0-0x8955000decd07984

A: UP, PRIMARY
B: DOWN, INAPPLICABLE

A: memb state UP, lead state PRIMARY, mgmt services state: UP
B: memb state DOWN, lead state INAPPLICABLE, mgmt services state: DOWN
   heartbeat state SECONDARY_FAILED

INTERNAL NETWORK INTERFACES:
eth1, DOWN
eth2, DOWN

HA NOT READY
Peer Fabric Interconnect is down
Detailed state of the device selected for HA storage:
Chassis 1, serial: FOX1344G1R1, state: active
Chassis 2, serial: FOX1318GDKR, state: active
FI-A#
```

Step 7 Remove the fabric interconnect from the rack. Follow the instructions in Removing a Cisco UCS Fabric Interconnect From a Rack, on page 49.

Step 8 Install the replacement fabric interconnect to the rack. Follow the instructions in Installing the Cisco UCS FI 6454 in a Cabinet or Rack, on page 20.

Step 9 Connect the management and console cables to the replacement fabric interconnect.

Step 10 Connect the L1/L2 cables that were disconnected to the replacement fabric interconnect.

Step 11 Connect the data cable according to the labels that you created in Step 2.

Step 12 Connect the power cable to the fabric interconnect and it will automatically boot and run POST tests.

```
        ---- Basic System Configuration Dialog ----

  This setup utility will guide you through the basic configuration of
  the system. Only minimal configuration including IP connectivity to
  the Fabric interconnect and its clustering mode is performed through these steps.

  Type Ctrl-C at any time to abort configuration and reboot system.
  To back track or make modifications to already entered values,
  complete input till end of section and answer no when prompted
  to apply configuration.


  Enter the configuration method. (console/gui) ? console

  Installer has detected the presence of a peer Fabric interconnect.
  This Fabric interconnect will be added to the cluster. Continue (y/n) ? y

  Enter the admin password of the peer Fabric interconnect:
    Connecting to peer Fabric interconnect... done
    Retrieving config from peer Fabric interconnect... done
    Peer Fabric interconnect Mgmt0 IP Address: 122.255.252.2
    Peer Fabric interconnect Mgmt0 IP Netmask: 255.255.255.0
    Cluster IP address          : 122.255.252.1

  Physical Switch Mgmt0 IPv4 address : 122.255.252.3
```

```
  Apply and save the configuration (select 'no' if you want to re-enter)? (yes/no): yes
  Applying configuration. Please wait.
Configuration file - Ok


Cisco UCS 6454 Fabric Interconnect

FI-B login:
```

Step 13 If necessary, upgrade the UCS Manager software. If the replacement fabric interconnect is not running the same firmware version as the cluster, the setup utility can upgrade the firmware.

Example:

```
---- Basic System Configuration Dialog ----

  This setup utility will guide you through the basic configuration of
  the system. Only minimal configuration including IP connectivity to
  the Fabric interconnect and its clustering mode is performed through
  these steps.

  Type Ctrl-C at any time to abort configuration and reboot system.
  To back track or make modifications to already entered values,
  complete input till end of section and answer no when prompted
  to apply configuration.


  Enter the configuration method. (console/gui) ? console

  Installer has detected the presence of a peer Fabric interconnect.
  This Fabric interconnect will be added to the cluster. Continue (y/n) ? y

  Enter the admin password of the peer Fabric interconnect:
    Connecting to peer Fabric interconnect... done
    Retrieving config from peer Fabric interconnect... done
    Installer has determined that the peer Fabric Interconnect is
    running a different firmware version than the local Fabric.
    Cannot join cluster.

    Local Fabric Interconnect
      UCSM version     : 3.1(2c)
      Kernel version   : 5.0(3)N2(3.12b)
      System version   : 5.0(3)N2(3.12b)
      local_model_no   : UCS-FI-6454

    Peer Fabric Interconnect
      UCSM version     : 3.1(2c)
      Kernel version   : 5.0(3)N2(3.12c)
      System version   : 5.0(3)N2(3.12c)
      peer_model_no    : UCS-FI-6454


  Do you wish to update firmware on this Fabric Interconnect to the
  Peer's version? (y/n): y
  Updating firmware of Fabric Interconnect.......
  [ Please don't press Ctrl+c while updating firmware ]

 Updating images
 Please wait for firmware update to complete.

 <output truncated>

 Install has been successful.
```

```
Firmware Updation Successfully Completed. Please wait to enter the IP address
   Peer Fabric interconnect Mgmt0 IPv4 Address: xx.xx.xx.xx
   Peer Fabric interconnect Mgmt0 IPv4 Netmask: xx.xx.xx.xx
   Cluster IPv4 address          : xx.xx.xx.xx

   Peer FI is IPv4 Cluster enabled. Please Provide Local
   Fabric Interconnect Mgmt0 IPv4 Address

 Physical Switch Mgmt0 IP address : xx.xx.xx.xx

 Apply and save the configuration (select 'no' if you want to re-enter)?
 (yes/no): yes
 Applying configuration. Please wait.

 Fri Dec  9 19:57:15 UTC 2016
 Configuration file - Ok
```

Step 14 Enter the **show cluster extended-state** command to revalidate the cluster state and verify that HA is ready.

Example:

```
FI-A# show cluster extended-state
Cluster Id: 0x537d0580bf9911e0-0x8955000decd07984

A: UP, PRIMARY
B: UP, SUBORDINATE

A: memb state UP, lead state PRIMARY, mgmt services state: UP
B: memb state UP, lead state SUBORDINATE, mgmt services state: UP
   heartbeat state PRIMARY_OK

INTERNAL NETWORK INTERFACES:
eth1, UP
eth2, UP

HA READY   <<<<<<<<<<<<<←---------------- HA is READY
Detailed state of the device selected for HA storage:
Chassis 1, serial: FOX1344G1R1, state: active
Chassis 2, serial: FOX1318GDKR, state: active
FI-A#
```

Step 15 Disable fabric evacuation and verify that traffic is flowing in both fabric interconnects.

Step 16 Apply the port license to the new fabric interconnect.

Removing a Cisco UCS Fabric Interconnect From a Rack



Caution Support both sides of the fabric interconnect when removing it from the rack. The slider rail and front rack-mount brackets do not have a stop mechanism. If the front of the chassis is unfastened from the rack and the chassis slides forward on the slider rails, it may slip off the end of the rails and fall out of the rack.

Procedure

Step 1 Ensure that the weight of the Cisco UCS Fabric Interconnect is fully supported and that the chassis is being held by another person.

Step 2 Remove the two screws holding the grounding cable to the chassis (if installed).

Step 3 Disconnect the power cords and any console cables.

Step 4 Disconnect all cables that are connected to SFP28 transceivers.

Step 5 Remove the screws fastening the front rack-mount brackets to the mounting rails.

Step 6 Gently slide the Cisco UCS Fabric Interconnect toward you, off of the slider rails and out of the rack.

Repacking the Cisco UCS Fabric Interconnect for Return Shipment

If you need to return the fabric interconnect, remove the fabric interconnect from the rack and repack it for shipment. If possible, use the original packing materials and container to repack the unit. Contact your Cisco customer service representative to arrange for return shipment to Cisco.

Replacing Components

Replacing a Fan Module

You can replace a fan module while the switch is operating, as long as you perform the replacement within one minute. If you cannot perform the replacement within one minute, leave the original fan module in the chassis to maintain the designed airflow until you have the replacement fan module on hand and can perform the replacement.



Caution If you are replacing a module during operations, verify the replacement fan module has the correct direction of airflow. This means that it has the **same airflow direction** as the other modules in the chassis. Also, verify that the airflow direction takes in air from a cold aisle and exhausts air to a hot aisle. Otherwise, the switch can overheat and shutdown.

If you are changing the airflow direction of all the modules in the chassis, shutdown the switch before replacing all the fan and power supply modules with modules using the other airflow direction. During operations, all of the modules must have the same direction of airflow.

Removing a Fan Module



Caution The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

Procedure

Step 1 On the fan module that you are removing, press the two sides of the fan module handle together, and pull on the handles enough to unseat it from its connectors.

Step 2 Holding the handle, pull the module out of the chassis.

Caution
Do not touch the electrical connectors on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Installing a Fan Module

Before you begin

- A fan slot must be open and ready for the new fan module to be installed.
- If the switch is operating, you must have a new fan module on hand and ready to install within one minute of removing the original fan module.
- The new fan module must have the **same airflow direction** as the other fan and power supply modules installed in the switch.

Procedure

Step 1 Holding the fan module by its handle, align the back of the fan module (the side with the electrical connectors) to the open fan slot in the chassis.

Step 2 Slide the fan module into the slot until it clicks in place.

Step 3 Verify that the Status (STS) LED turns on and becomes green.

Replacing a Power Supply Module

The switch requires two power supplies for redundancy. With one power supply providing the necessary power for operations, replace the other power supply during operations as long as the new power supply has the same airflow direction as the other modules in the chassis.

Replace a power supply with another supported power supply that has the same power source type as the other installed power supply. Additionally, the airflow direction of the power supply must match or conform to the airflow direction of the installed fan modules. For the airflow direction used by the switch, see the coloring of the fan modules.

Replacing an AC Power Supply

Replace an AC power supply during operations as long as the other power supply provides power to the switch.

Before you begin

Note Determine the airflow direction by looking at the coloring of the latch on each power supply. AC power supplies with burgundy latches have port-side intake airflow direction AC power supplies with blue latches have port-side exhaust airflow direction.

- The replacement power supply must have the same wattage and airflow direction as the power supply being replaced. Do not mix AC, DC, HVAC/HVDC power supplies in the same switch.
- An AC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using n+n power redundancy, there must be a separate power source for each power supply installed in the chassis.
- There must be an earth ground connection to the chassis that you are installing the replacement module. AC power supplies connected to AC power sources are automatically grounded through their power cable.

Procedure

Step 1 Remove an AC power supply.

a) Holding the plug for the power cable, pull the plug out from the power receptacle on the power supply and verify that both power supply LEDs are off.
b) Grasp the power supply handle while pressing the colored release latch towards the power supply handle.
c) Place your other hand under the power supply to support it while you slide it out of the chassis.

Note
Do not touch the electrical connections on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Step 2 Install the replacement power supply.

a) Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note
If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

b) Test the installation by trying to pull the power supply out of the slot without using the release latch.

If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.

c) Attach the power cable to the electrical outlet on the front of the power supply.
d) Make sure that the other end of the power cable is attached to the appropriate power source for the power supply.

Note
Depending on the outlet receptacle on your power distribution unit, you might need the optional jumper cable to connect the switch to your outlet receptacle.

e) Verify that the power supply is operational by making sure that the power supply LED is green.

Replacing a High Voltage (HVAC/HVDC) Power Supply

Replace an HVAC/HVDC power supply during operations as long as the other power supply provides power to the switch.

Before you begin

- The replacement power supply must have the same wattage and airflow direction as the power supply being replaced. Do not mix AC, DC, HVAC/HVDC power supplies in the same switch.



Note Determine the airflow direction by looking at the coloring of the latch on each power supply. HVAC/HVDC power supplies have white latches. White latches indicate that they have dual airflow directional capability. Those power supplies automatically use the same airflow direction as the fan modules installed in the same switch.

- An HVAC/HVDC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using *n*+*n* power redundancy, there must be a separate power source for each power supply installed in the chassis.
- There must be an earth ground connection to the chassis in which you are installing the replacement power supply. HVAC/HVDC power supplies connected to AC power sources are automatically grounded by their power cable when connected to the power supply and AC power source. HVAC/HVDC power supplies connected to DC power sources have Saf-D-Grid power cables with three connectors on the power source end--you connect one of those connectors to the earth ground.

Procedure

Step 1 Remove an HVAC/HVDC power supply.

a) Turn off the circuit breaker for the power feed to the power supply that you are replacing.

Be sure that the LEDs turn off on the power supply that you are removing.

b) Remove the power cable from the power supply by pressing the tab on the top of the Anderson Power SAF-D-Grid connector and pull the cable and connector out of the power supply.
c) Grasp the power supply handle while pressing the colored release latch towards the power supply handle.
d) Place your other hand under the power supply to support it while you slide it out of the chassis.

Caution
Do not touch the electrical connections on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Step 2 Install the replacement power supply.

a) Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note
If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

b) Test the installation by trying to pull the power supply out of the slot without using the release latch.

If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.

c) Attach the Saf-D-Grid end of the power cable to the electrical outlet on the front of the power supply.
d) Make sure that the other end of the power cable is attached to the appropriate power source for the power supply.
   - For an HVAC power source, plug the other end of the power cable into the power source.
   - For a HVDC power source, verify that the circuit breaker is turned off and then connect each of the three cable connectors to the appropriate DC and grounding terminals on the power source. If there is a cover plate for the DC terminals, install the plate to prevent accidental contact with the terminals.
e) If using an HVDC power source, turn on the circuit breaker for the power source.
f) Verify that the power supply is operational by making sure that the power supply LED is green.

Replacing a DC Power Supply

Replace a DC power supply during operations so long as the other power supply provides power to the switch.

Before you begin

- Replace a power supply with the same wattage and airflow direction as the power supply being replaced. Do not mix AC, DC, HVAC/HVDC power supplies in the same switch.



Note Determine the airflow direction by looking at the coloring of the latch on each power supply. AC power supplies with burgundy latches have port-side *intake* airflow direction. AC power supplies with blue latches have port-side *exhaust* airflow direction.

- A DC power source must be within reach of the power cables that will be used with the replacement power supply. If you are using *n*+*n* power redundancy, there must be a separate power source for each power supply installed in the chassis.

- There must be an earth ground connection to the chassis in which you are installing the replacement power supply. If the switch is mounted properly in a grounded rack then there is no need to ground the PSU. Some DC power supplies connected to DC power sources have three power cables (two for DC power and one for grounding). Some, like the (NXA-PDC-1100W) only have two power cables (both for DC power).
- We recommend 8-AWG wire for DC installation in the U.S.
- All DC power supplies have reverse polarity protection. When you inadvertently connect the input power (+) to the DC PSU's – terminal and the input power – to the DC PSU's (+) terminal, the PSU will not be damaged and will operate fine after the input power feeds are correctly wired.

Procedure

Step 1 Remove a DC power supply.

a) Turn off the circuit breaker for the power feed to the power supply that you are replacing.

Be sure that the LEDs turn off on the power supply that you are removing.

b) Remove the DC power connector block from the power supply.

1. Push the orange plastic button on the top of the connector block inward toward the power supply.
2. Pull the connector block out of the power supply.

c) Grasp the power supply handle while pressing the release latch towards the power supply handle.

d) Place your other hand under the power supply to support it while you slide it out of the chassis.

Caution
Do not touch the electrical connections on the back side of the module and prevent anything else from coming into contact with and damaging the connectors.

Step 2 Install the replacement power supply.

a) Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the right side and align the back end of the power supply (the end with the electrical connections) to the open power supply slot before carefully sliding the power supply all the way into the slot until it clicks into place.

Note
If the power supply does not fit into the open slot, turn the module over before sliding it carefully into the open slot.

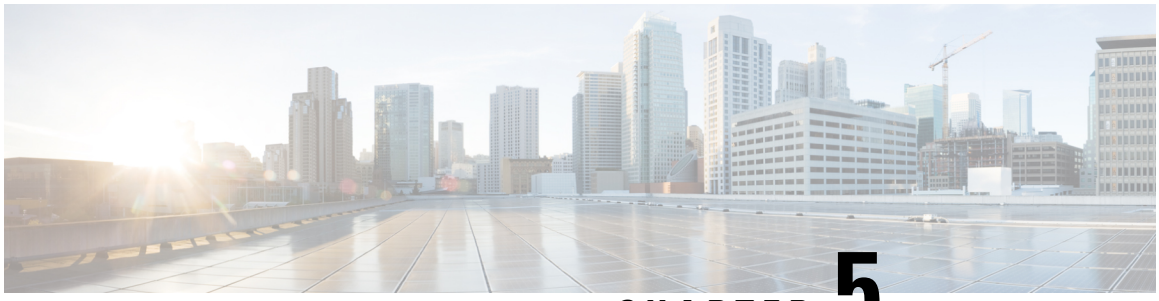
b) Test the installation by trying to pull the power supply out of the slot without using the release latch.

If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks in place.

c) Attach the power connector block end of the power cable to the electrical outlet on the front of the power supply.

d) Turn on the circuit breaker for the power source.

e) Verify that the power supply is operational by making sure that the power supply LED is green.



CHAPTER 5

Technical Specifications

- System Specifications, on page 57
- Power Specifications, on page 58
- Transceiver Specifications, on page 60

System Specifications

Physical Specifications

Table 5: Cisco UCS 6454 FI Physical Specifications

Description	Specification
Dimensions	• Height: 1.72 in. (44 mm) • Width: 17.3 In. (225 mm) • Length: 22.5 in. (571 mm)
Weight	22 lb (9.97 kg) (with two power supplies installed)

—

Table 6: Cisco UCS 64108 FI Physical Specifications

Description	Specification
Dimensions	• Height: 3.38 in. (85.9 mm) • Width: 17.41 in. (442.3 mm) • Length: 24.14 in. (613.2 mm)
Weight	27.4 pounds (12.4 kg) (with two power supplies installed)

Environmental Specifications

Table 7: Cisco UCS 6400 Series FI Environmental Specifications

Description	Specification
Temperature, operating	32 to 104°F (0 to 40°C)
Temperature, nonoperating	-40 to 158°F (-40 to 70°C)
Humidity (RH), noncondensing	5 to 95%
Altitude	0 to 10000 ft (0 to 3000 m)

Power Specifications

Cisco UCS Fabric Interconnect supports AC or DC power supplies. You must use identical power supplies—either two AC or two DC power supplies with the fabric interconnect. .

Note You cannot mix power supply types in a Cisco UCS Fabric Interconnect.

Note The Cisco UCS 6454 FI and the UCS 6300 Series FIs use the same 650 W AC power supplies, so the ordering PIDs are the same.

Table 8: UCS 6454 FI Only: 650 W AC Power Supply Specifications (UCS-PSU-6332-AC)

AC Power Supply Properties	Specification
Maximum output per power supply	650 W
Input voltage	100 to 240 VAC
Maximum AC input current	7.6 A @ 100 VAC 3.65 A @ 208 VAC
Maximum holdup time	12 ms @50% load
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
RoHS compliance	Yes
Hot swappable	Yes
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum Certified)

Table 9: UCS 64108 FI Only: 1200 W AC Power Supply Specifications (UCS-PSU-64108-AC)

AC Power Supply Properties	Specification
Maximum output per power supply	1200 W
Input voltage range	90 to 264 VAC
Maximum AC input current	11 A @ 100 VAC 7 A @ 200 VAC
Maximum holdup time	12 ms @50% load
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
RoHS compliance	Yes
Hot swappable	Yes
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum Certified)

Note The Cisco UCS 6400 Series FIs and the UCS 6300 Series FIs use the same 930 W DC power supplies, so the ordering PIDs are the same.

Table 10: UCS 6400 Series FIs: 930 W DC Power Supply Specifications (UCS-PSU-6332-DC)

DC Power Supply Properties	Specification
Maximum output per power supply	930 W
Input voltage	-48 VDC
Maximum HVDC input current	23 A maximum @ -48 VDC
Maximum holdup time	8 ms @ 50% load
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
RoHS compliance	Yes
Hot swappable	Yes
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum Certified)

Transceiver Specifications

Table 11: General Specifications for the 10-Gigabit Ethernet SFP+ Transceiver Module

Description	Short Range	
Connector type	LC	
Wavelength	850 nm	
Core size—Cable distance	50 microns—300 m	62.5 microns—33 m

Environmental Conditions and Power Requirements Specification for SFP Transceivers

Table 12: Environmental Conditions and Power Requirements Specifications for SFP Transceivers

Parameter	Symbol	Minimum	Maximum
Storage temperature [1]	TS	-40°C (-40°F)	85°C (185°F)
Case temperature [2,]	TC	0°C (32°F)	70°C (158°F)
Relative humidity [2]	RH	5%	95%
Module supply voltage [2]	VCCT,R	3.1 V	3.5 V

[1] Absolute maximum ratings are those values beyond which damage to the device may occur if these limits are exceeded for other than a short period of time.

[2] Functional performance is not intended, device reliability is not implied, and damage to the device may occur over an extended period of time between absolute maximum ratings and the recommended operating conditions.

General Specifications for Cisco Fibre Channel SFP Transceivers

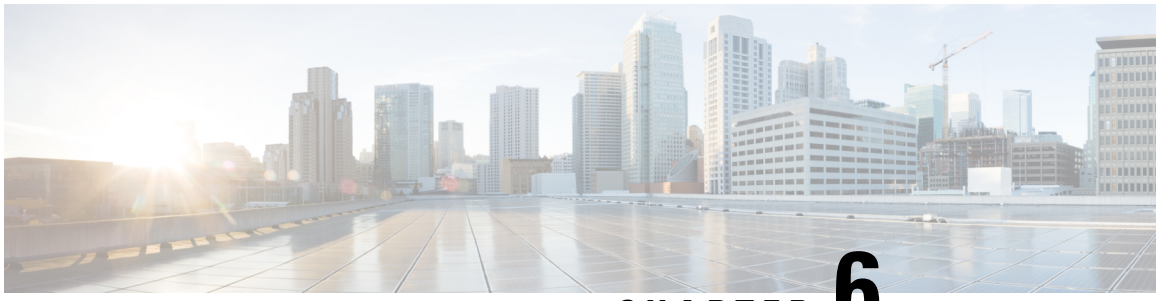
The table below lists the general specifications for Cisco Fibre Channel SFP transceivers at 4 Gbps.

Table 13: General Specifications for Cisco Fibre Channel SFP Transceivers at 4 Gbps

Description	Short Wavelength	
Connector type	LC	
Wavelength	850 nm	
Fibre type	MMF	
Core size—Cable distance	50 microns—328.08 yd (300 m)	62.5 microns—164.04 yd (150 m)

Description	Short Wavelength
Transmit power	-9 to -2.5 dBM

[3] Approximate; actual distance may vary depending on fiber quality and other factors.



CHAPTER 6

Cable and Port Specifications

- Accessory Kit for the Cisco UCS Fabric Interconnect, on page 63
- Console Cable, on page 64
- Console Port, on page 64
- Supported AC Power Cords and Plugs, on page 65

Accessory Kit for the Cisco UCS Fabric Interconnect

The Cisco UCS Fabric Interconnect accessory kit includes the following items:

- 2 slider rails
- 2 rear rack-mount guides
- 2 front rack-mount brackets
- 12 M4 x 0.7 x 8-mm Phillips countersunk screws
- 10 10-32 rack nuts
- 10 10-32 x 3/4-inch Phillips pan-head screws
- 1 RS-232 console cable with an RJ-45 adapter and a DB9 adapter
- 1 ground-lug kit
- 1 ESD wrist strap
- 1 power cord clip (a wire clip that is used to retain the power cord)
- 1 pointer document (specifies where to find the online product documentation)

Note Additional parts can be ordered from your customer service representative.

Console Cable

The console cable has an RJ-45 connector on one end and a DB9 connector on the other; this cable is used to connect into the RS-232 console connection on a laptop.

Console Cable

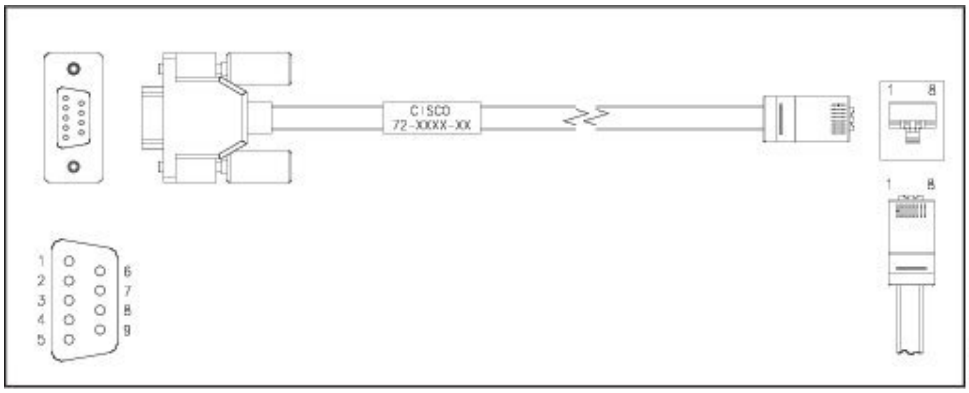


Table 14: Console Cable Connector Pinouts

Signal Name	P1, P1-45 Pins	P2, DB-9 Pins	Signal Name
RTS	1	8	CTS
DTR	2	6	DSR
TXD	3	2	ZXD
GND	4	5	GND
GND	5	5	GND
ZXD	6	3	TXD
DSR	7	4	DTR
CTS	8	7	RTS

Console Port

The console port is an asynchronous RS-232 serial port with an RJ-45 connector.

The table below lists the pinouts for the console port on the Cisco UCS 6454 Fabric Interconnect.

Table 15: Console Port Pinouts

Pin	Signal
1	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

Depending on the laptop you use for the initial configuration, you may also want a USB 2.0 to Serial (9-pin) DB-9 RS-232 Adapter Cable as well as a terminal program like Hyperterminal or PuTTY (set to connect at 9600 baud, 8 data bits, 1 stop bit, no parity).

Supported AC Power Cords and Plugs

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to a power distribution unit having IEC 60320 C13 outlet receptacles. The jumper power cords, for use in cabinets, are available as an optional alternative to the standard power cords.

The standard power cords have an IEC C13 connector on the end that plugs into the power supplies. The optional jumper power cords have an IEC C13 connector on the end that plugs into the power supplies, and an IEC C14 connector on the end that plugs into an IEC C13 outlet receptacle.

Note Only the regular power cords or jumper power cords provided with the chassis are supported.

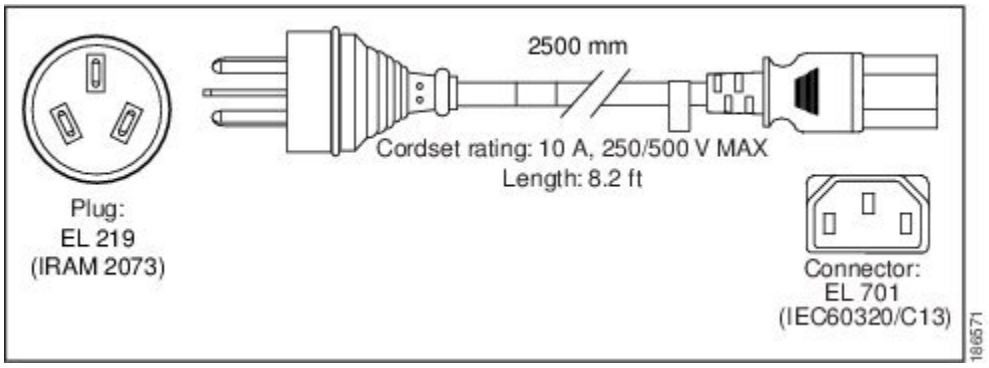
Argentina

Power Cord—SFS-250V-10A-AR

Plug—250 VAC 10 A IRAM 2073

Length—8.2 feet / 2.5 meters

Figure 14: SFS-250V-10A-AR



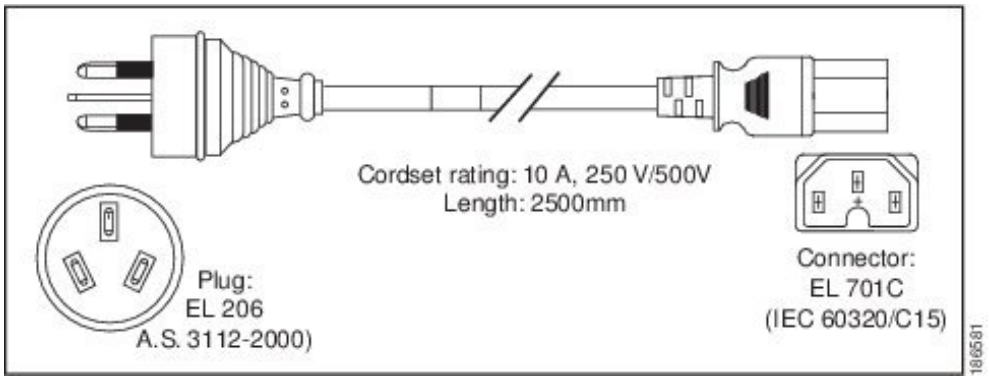
Australia and New Zealand

Power Cord—CAB-9K10A-AU

Plug—250 VAC 10 A 3112

Length—8.2 feet / 2.5 meters

Figure 15: CAB-9K10A-AU



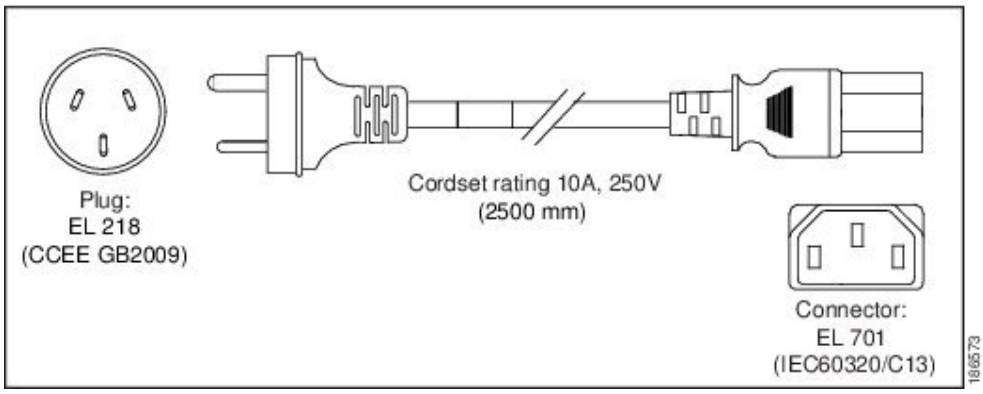
Peoples Republic of China

Power Cord—SFS-250V-10A-CN

Plug—250 VAC 10 A GB 2009

Length—8.2 feet / 2.5 meters

Figure 16: SFS-250V-10A-CN



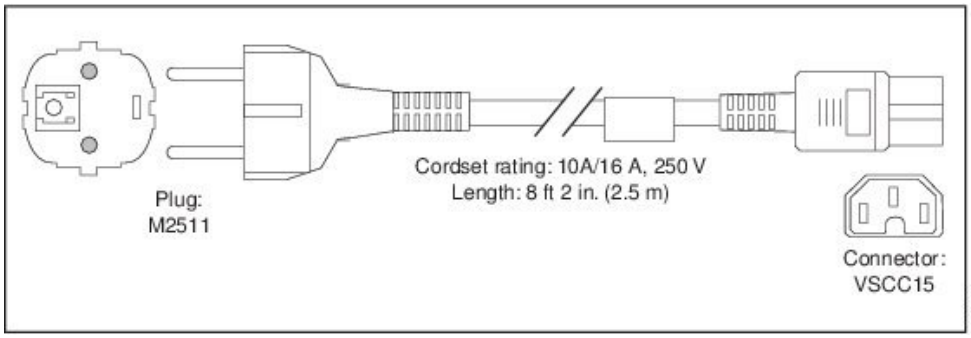
Europe

Power Cord—CAB-9K10A-EU

Plug—250 VAC 10 A M 2511

Length—8.2 feet / 2.5 meters

Figure 17: CAB-9K10A-EU



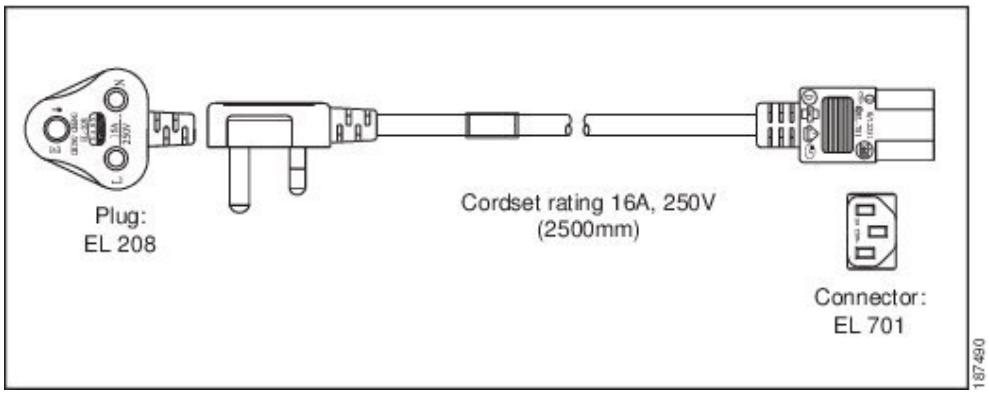
India, South Africa, and United Arab Emirates

Power Cord—SFS-250V-10A-ID

Plug—250 VAC 16A EL-208

Length—8.2 feet / 2.5 meters

Figure 18: SFS-250V-10A-ID



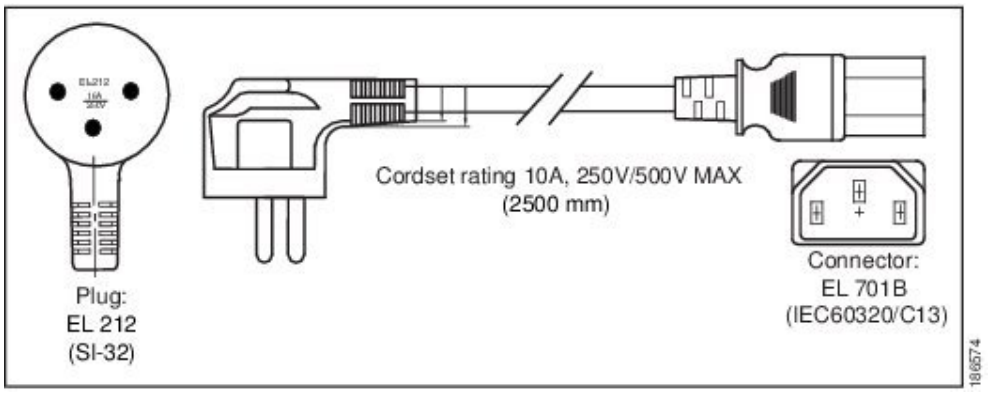
Israel

Power Cord—SFS-250V-10A-IS

Plug—250 VAC 10 A SI32

Length—8.2 feet / 2.5 meters

Figure 19: SFS-250V-10A-IS



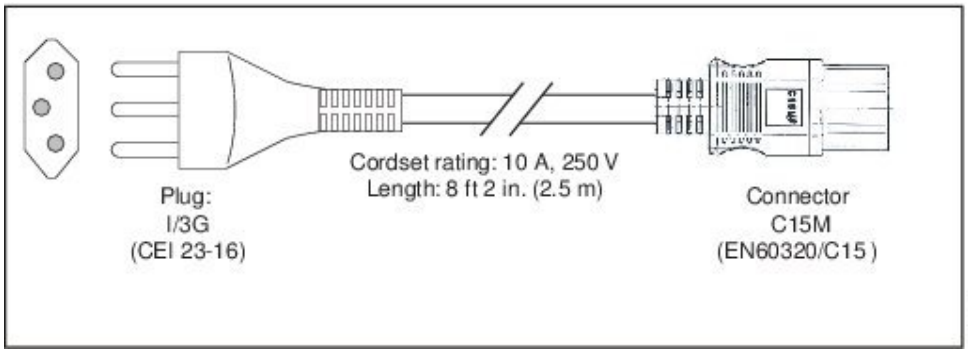
Italy

Power Cord—CAB-9K10A-IT

Plug—250 VAC 10 A CEI 23-16

Length—8.2 feet / 2.5 meters

Figure 20: CAB-9K10A-IT



North America

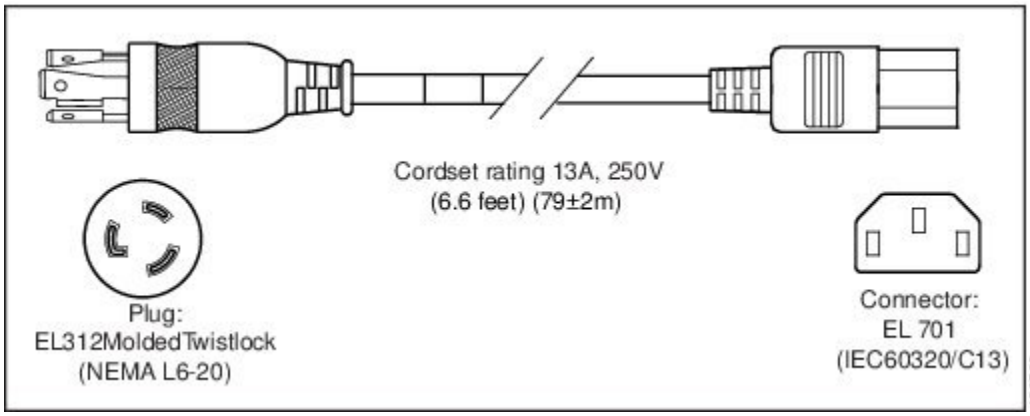
CAB-AC-250V/13A

Power Cord—CAB-AC-250V/13A

Plug—250 VAC 13 A IEC60320

Length—6.6 feet / 2.0 meters

Figure 21: CAB-AC-250V/13A



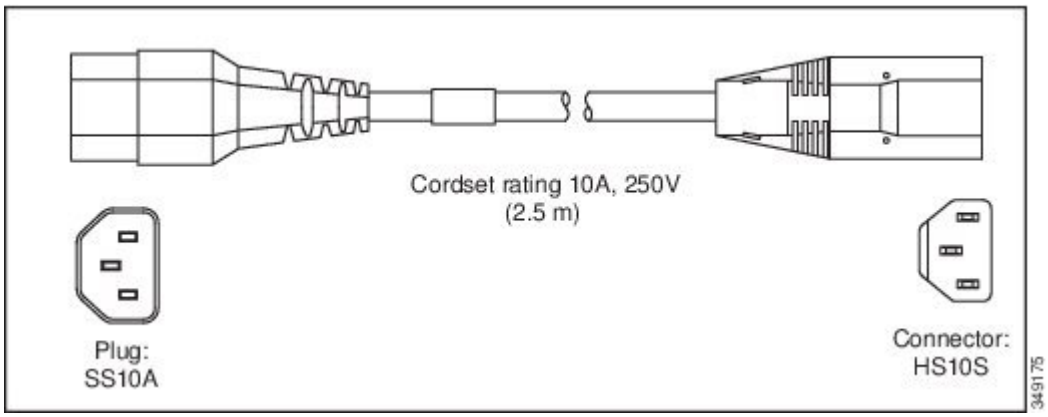
CAB-N5K6A-NA

Power Cord—CAB-N5K6A-NA

Plug—250 VAC 13 A NEMA 6-15

Length—8.2 feet / 2.5 meters

Figure 22: CAB-N5K6A-NA



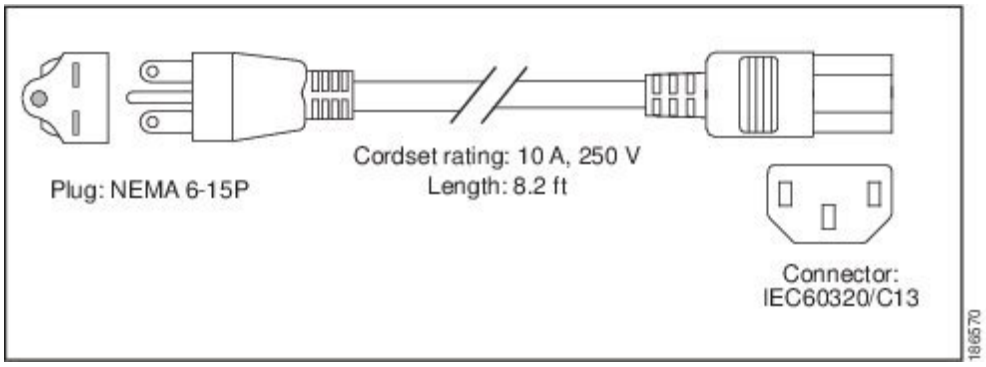
Switzerland

Power Cord—CAB-9K10A-SW

Plug—250 VAC 10 A MP232

Length—8.2 feet / 2.5 meters

Figure 23: CAB-9K10A-SW



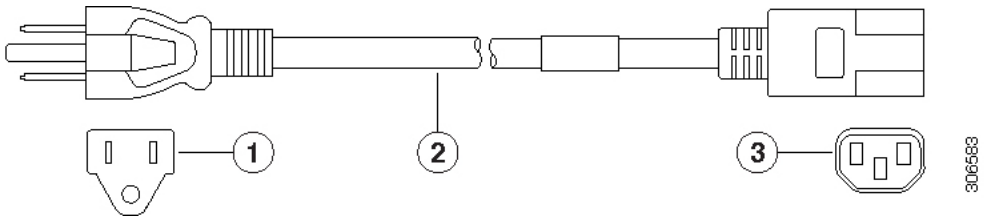
Taiwan

Power Cord—CAB-ACTW

Plug—125 VAC, 10 A, CNS10917

Length—7.5 feet / 2.3 meters

Figure 24: CAB-ACTW



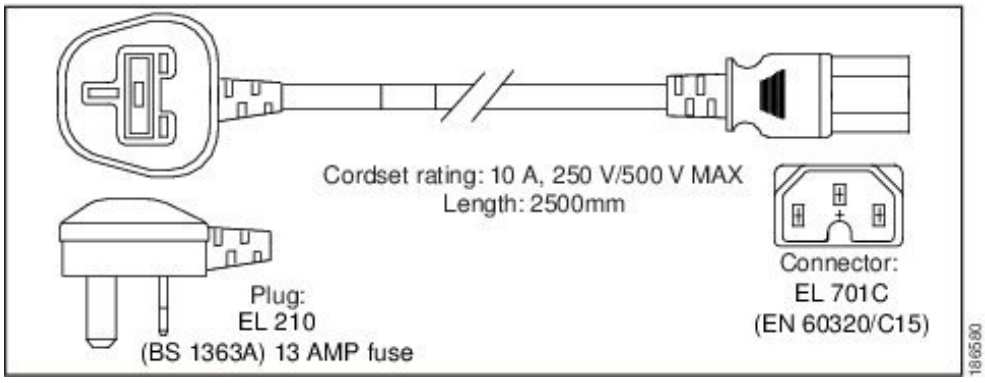
United Kingdom

Power Cord—CAB-9K10A-UK

Plug—250 VAC 10 A BS1363 (13 A fuse)

Length—8.2 feet / 2.5 meters

Figure 25: CAB-9K10A-UK



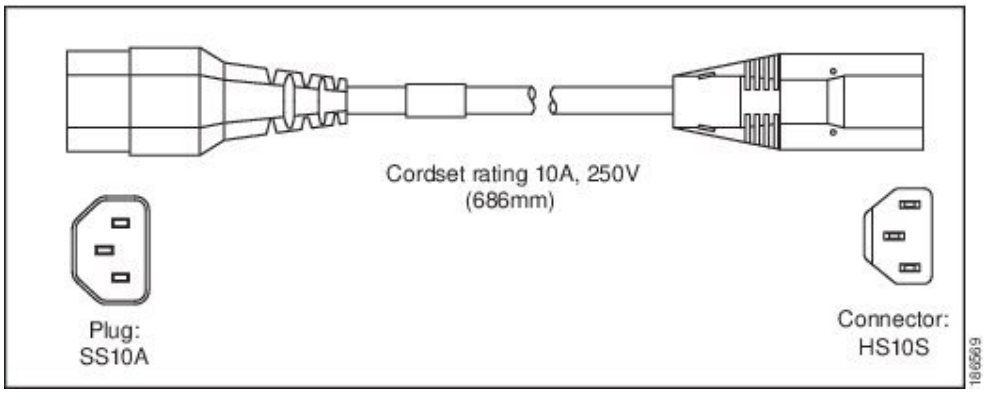
Cabinet Jumper Power Cords

Jumper Power Cord—CAB-C13-C14-JMPR

Plug— 250 VAC 10 A, C13-C14 Connectors

Length—2.2 feet / 0.7 meters

Figure 26: CAB-C13-C14-JMPR

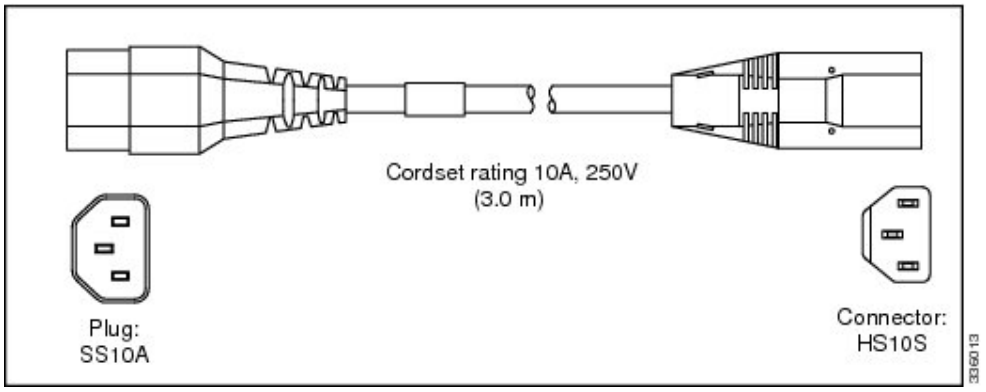


Jumper Power Cord—CAB-C13-C14-AC

Plug— 250 VAC 10 A, C13-C14 Connectors

Length—9.8 feet / 3 meters

Figure 27: CAB-C13-C14-AC

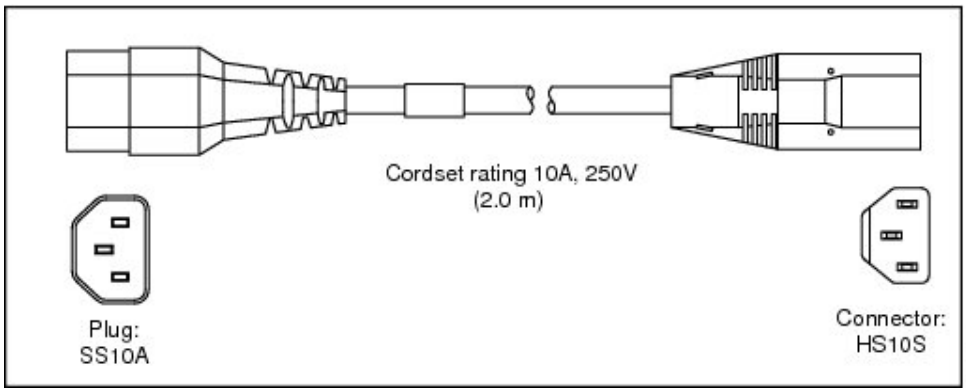


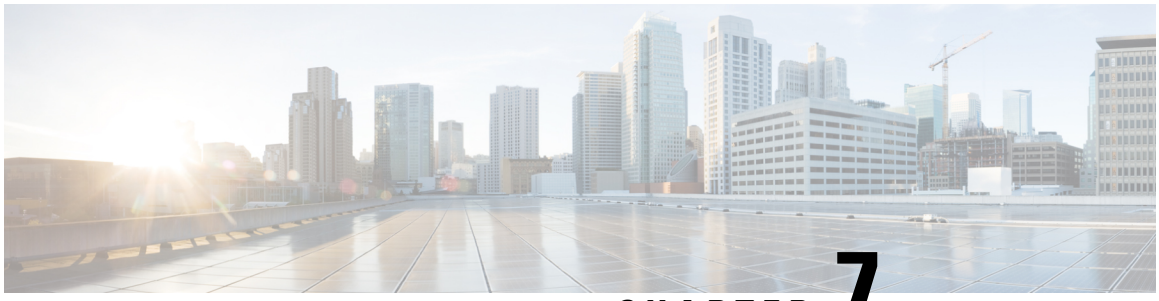
Jumper Power Cord—CAB-C13-C14-2M

Plug— 250 VAC 10 A, C13-C14 Connectors

Length—6.6 feet / 2 meters

Figure 28: CAB-C13-C14-2M





CHAPTER 7

Site Planning and Maintenance Records

- Site Preparation Checklist, on page 75
- Contact and Site Information, on page 76
- Chassis and Module Information, on page 77

Site Preparation Checklist

Planning the location and layout of your equipment is essential for successful system operation, ventilation, and accessibility.

Consider heat dissipation when sizing the air-conditioning requirements for an installation.

Table 16: Site Planning Checklist

Task No.	Planning Activity	Verified By	Time	Date
1	Space evaluation: • Space and layout • Floor covering • Impact and vibration • Lighting • Maintenance access			
2	Environmental evaluation: • Ambient temperature • Humidity • Altitude • Atmospheric contamination • Air flow			

Task No.	Planning Activity	Verified By	Time	Date
3	Power evaluation: • Input power type • Power receptacles • Receptacle proximity to the equipment • Dedicated circuit for power supply • Dedicated (separate) circuits for redundant power supplies • UPS for power failures			
4	Grounding evaluation: • Circuit breaker size • CO ground (AC- powered systems)			
5	Cable and interface equipment evaluation: • Cable type • Connector type • Cable distance limitations • Interface equipment (transceivers)			
6	EMI evaluation: • Distance limitations for signaling • Site wiring • RFI levels			

[4] Verify that the power supply installed in the chassis has a dedicated AC source circuit.
[5] UPS = uninterruptible power supply.
[6] EMI = electromagnetic interference.
[7] RFI = radio frequency interference.

Contact and Site Information

Use the following worksheet to record contact and site information.

Table 17: Contact and Site Information

Contact person	

Contact phone	
Contact e-mail	
Building/site name	
Data center location	
Floor location	
Address (line 1)	
Address (line 2)	
City	
State	
Zip code	
Country	

Chassis and Module Information

Use the following worksheets to record information about the chassis and modules.

Contract Number_____

Chassis Serial Number_____

Product Number_____

Table 18: Network-Related Information

System IP address	
System IP netmask	
Hostname	
Domain name	
IP broadcast address	
Gateway/router address	
DNS address	
Modem telephone number	

Table 19: Module Information

Slot	Module Type	Module Serial Number	Notes
1	Fixed		
2	Expansion		

Table 20: Fabric Interconnect Port Connection Record

Fabric Interconnect A or B		Connected to					
Slot	**Port**	**Chassis**	**FEX**	**Port**	**LAN or SAN Pin Group**	**Port Channel Group**	**Connection Notes**
1	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						

Fabric Interconnect A or B		Connected to					
Slot	**Port**	**Chassis**	**FEX**	**Port**	**LAN or SAN Pin Group**	**Port Channel Group**	**Connection Notes**
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
2	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						
	13						
	14						
	15						
	16						