

Cisco UCS 6600 Series Fabric Interconnect Installation and Service Guide

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Preface

This preface contains the following topics:

- Bias-Free Documentation, on page vii
- Full Cisco Trademarks with Hardware License, on page vii
- Communications, Services, and Additional Information, on page ix

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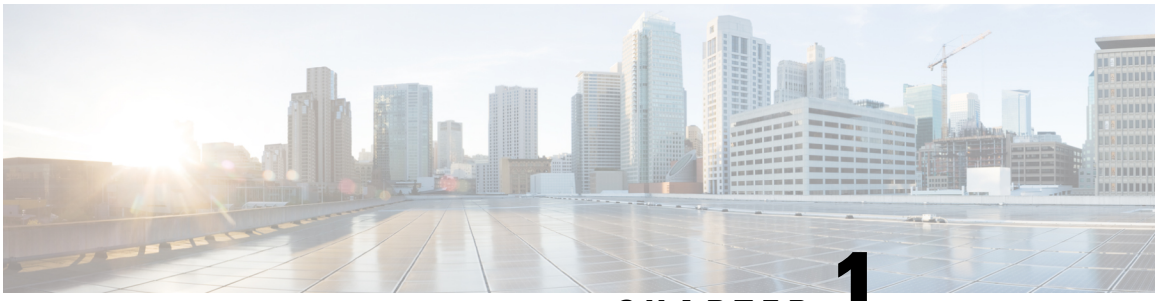
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CHAPTER 1

Overview

This chapter contains the following topics:

- Overview About Cisco UCS 6664 Fabric Interconnect, on page 1
- Overview About Cisco UCS 6652 Fabric Interconnect, on page 9

Overview About Cisco UCS 6664 Fabric Interconnect

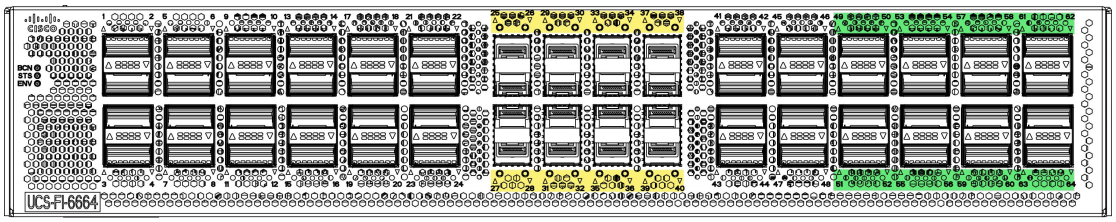
The Cisco UCS 6600 Series Fabric Interconnect product family consists of the Cisco UCS 6664 Fabric Interconnect and Cisco UCS 6652 Fabric Interconnect This overview is for the Cisco UCS 6664 Fabric Interconnect. For information about the Cisco UCS 6652 Fabric Interconnect, see Overview About Cisco UCS 6652 Fabric Interconnect.

The Cisco UCS 6664 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. The 6664 is a 10/25/40/50/100 Gigabit Ethernet, FCoE and Fiber Channel switch offering up to 11.65 Tbps throughput and up to 64 ports. The switch has 16 unified ports (port numbers 25-40 marked with yellow silkscreen) that can support 10/25/50-Gbps SFP Ethernet ports or 16/32/64-Gbps Fibre Channel ports, 48 40/100-Gbps Ethernet QSFP ports (port numbers 1-24 and 41-64). All Ethernet ports are capable of supporting FCoE. MACsec-capable QSFP ports 49-64 are marked with green silkscreen.

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

The Cisco UCS 6664 Fabric Interconnect fabric interconnect contains its own environmentals, such as power supplies and fans, on the rear panel of the chassis.

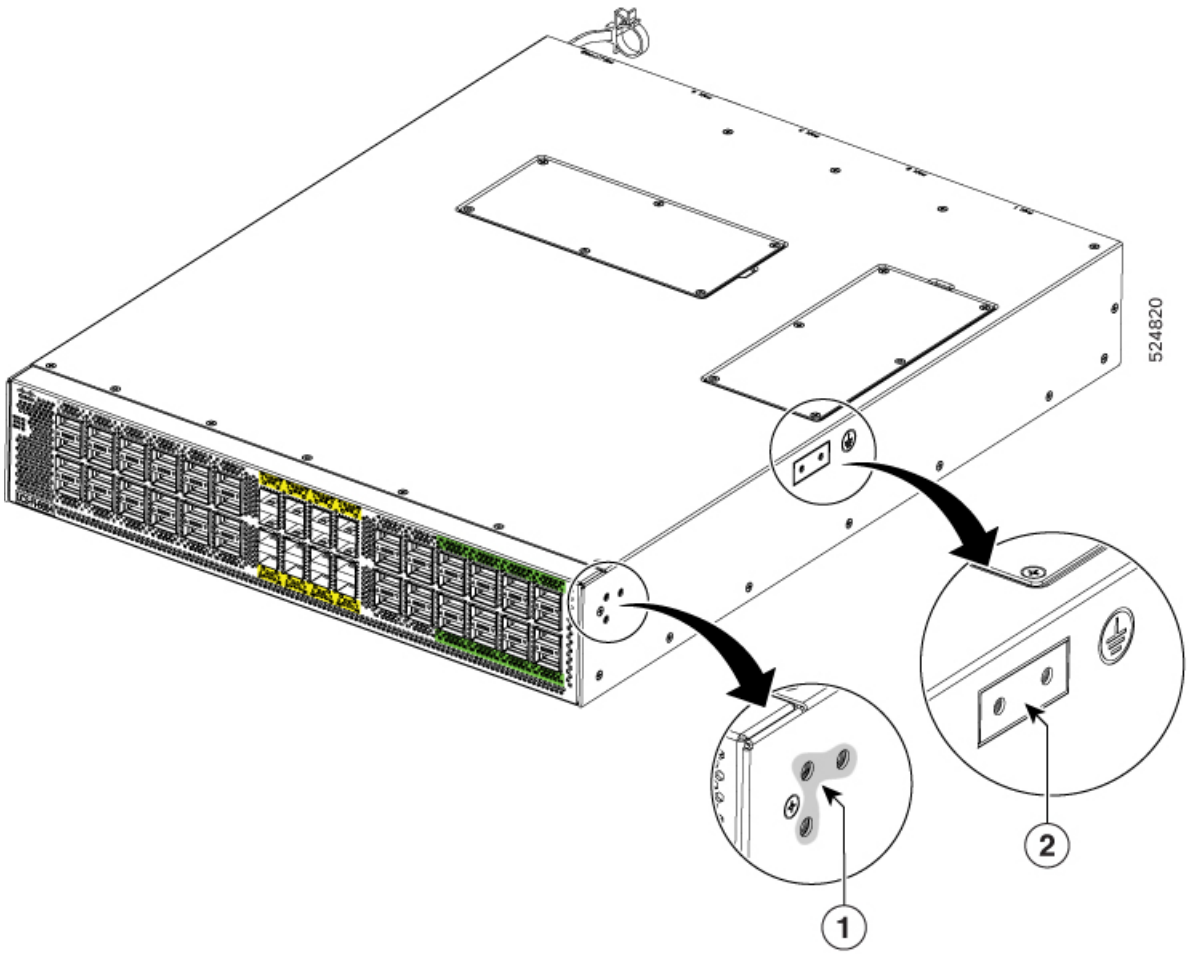
- Power supplies are redundant (1+1) that load share while both PSUs are operational, but a single PSU can power the entire fabric interconnect as needed, for example, during a PSU swap out.
- Fans are also redundant (N+1) and load sharing, and they are color-coded to show intake airflow from the cold aisle to exhaust into the hot aisle in the data center (port-side exhaust air flow). Fans are grouped as two fans per fan module with four total modules per fabric interconnect for a total of eight fans per system.



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The chassis also features the following, as shown in the following illustration.

- Areas on both side of the chassis for attaching mounting brackets. As rack mount kit is provided.
- For electrical ground, the chassis contains a grounding pad as shown in the figure .

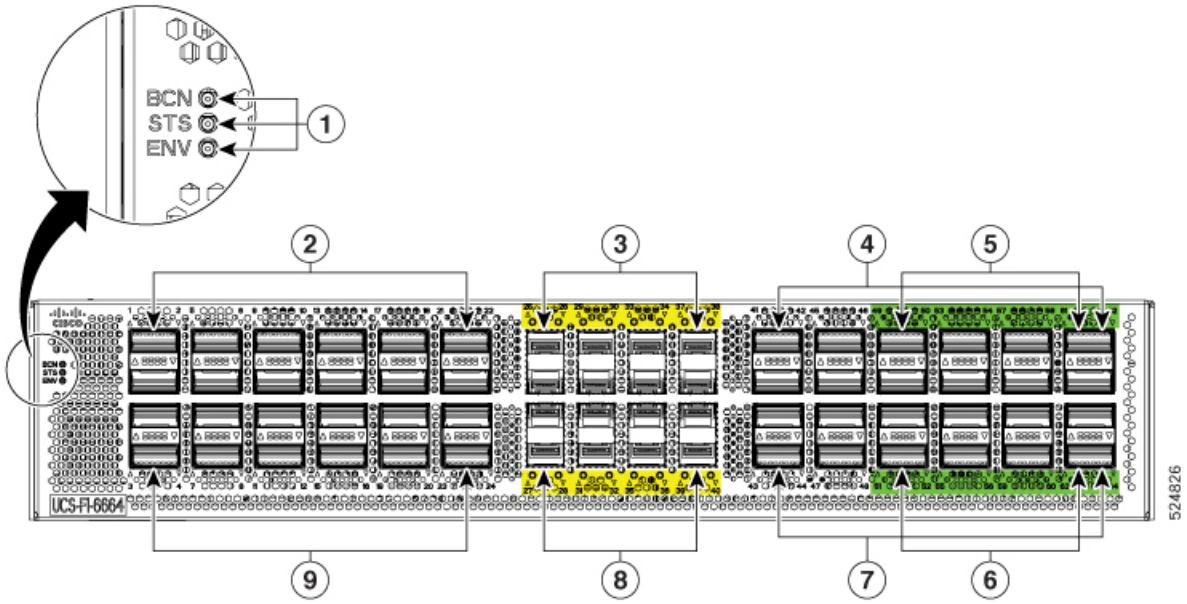


1	Screw holes for front mounting brackets (both left and right sides)	2	Grounding pad

Fabric Interconnect Front Panel

The fabric interconnect front panel contains the following fabric ports and system LEDs.

- Fabric ports can be Gigabit Ethernet (GbE), Fibre Channel (FC), or Fibre Channel over Ethernet (FCoE). Typically, ports support only GigE or FCoE. However, some ports, called Unified Ports, can support all three connection types. For information about which ports support which connection types, and what speeds the ports support, see Ports and Port Numbering, on page 8.
- System LEDs provide visual indicators of the operational states of the systems. For more information, see Chassis LEDs, on page 4.



The following table shows the contents of the fabric interconnect front panel. Ports are arranged in vertical columns as two pairs of ports.

1	Beacon (BCN), Status (STS), and Environment (ENV) LEDs	**2**	QSFP Ports 1, 2, 5, 6, 9,10, 13, 14, 17, 18, 21, and 22. Ports are arranged vertically in pairs and support QSA or QSA28 transceivers.
3	SFP Ports 25, 26, 29, 30, 33, 34, 37, and 38 are Unified Ports as indicated by the yellow silk screening.	**4**	QSFP Ports 41, 42, 45, 46, 49, 50, 53, 54, 57, 58, 61, and 62.
5	MACsec-capable QSFP ports 49, 50, 53, 54, 57, 58, 61, and 62.	**6**	MACsec-capable QSFP ports 51, 52, 55, 56, 59, 60, 63, and 64.
7	QSFP Ports 43, 44,47, 48, 51, 52, 55, 56, 59, 60, 63, and 64.	**8**	SFP Ports 27, 28, 31, 32, 35, 36, 39, and 40 are Unified Ports as indicated by the yellow silk screening.
9	QSFP Ports 3, 4, 7, 8, 11,12, 15, 16, 19, 20, 23, and 24. Ports are arranged vertically in pairs and support QSA or QSA28 transceivers.		

Chassis LEDs

The BCN, STS, and ENV LEDs are located on the left side of the front of the fabric interconnect. The port LEDs appear as triangles pointing up or down to the nearest port.

LED	Color	Status
BCN	Flashing blue	The operator has activated this LED to identify this fabric interconnect in the chassis.
	Off	This fabric interconnect is not being identified.
STS	Green	The fabric interconnect is operational.
	Flashing amber	The fabric interconnect is booting up.
	Amber	Temperature exceeds the minor alarm threshold.
	Red	The fabric interconnect is not operational or temperature exceeds the major alarm threshold.
	Off	The fabric interconnect is not receiving power.
ENV	Green	Fans and power supply modules are operational.
	Amber	At least one fan or power supply module is not operating.
(port)	Green	Port admin state is 'Enabled', SFP is present and the interface is connected (that is, cabled, and the link is up).
	Amber	Port admin state is 'Disabled, or the SFP is absent, or both.
	Off	Port admin state is 'Enabled' and SFP is present, but interface is not connected.

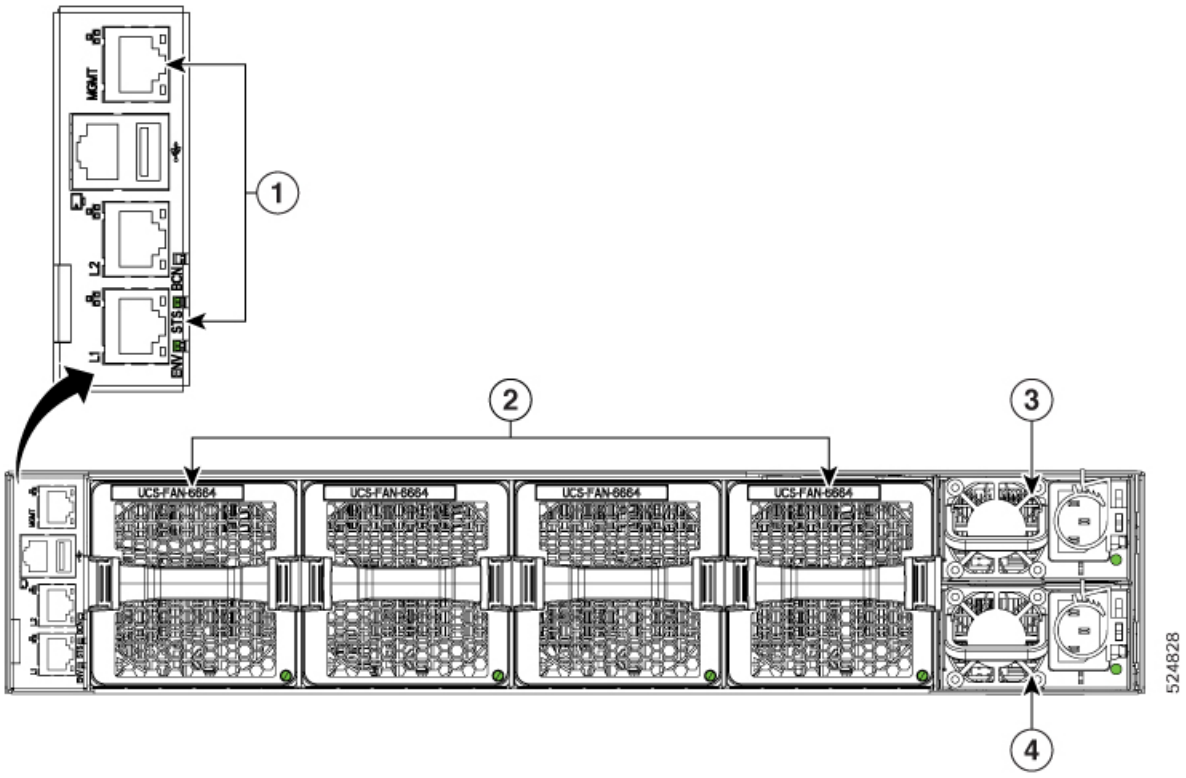
Uplink Module LEDs

There is a Status LED located below each uplink port.

LED	Color	Status
QSFP Port State	Green	Port admin state is Enabled. The SFP is present, and the interface is connected (cabled and the link is up)
	Amber	Port admin state is Disabled or the SFP is absent, or both
	Off	Port admin state is Enabled, and the SFP is present, but interface is not connected

Fabric Interconnect Rear Panel

The fabric interconnect rear panel contains the management module, fans, and power supplies.



1	Management module ports	**2**	Fan Modules, numbered one through four with fan 1 on the left and fan four on the right.
3	Power Supply 1.	**4**	Power Supply 2

Management Module

The management module enables connection to the fabric interconnect through any of the following:

- One RJ-45 Ethernet MGMT port for management console connectivity, supporting 10/100/1000Mb speeds (labeled MGMT on the module)
- Two L1/L2 Ethernet RJ-45 ports for high availability or cluster configurations, supporting 10/100/1000Mb speeds (labeled L1 and L2 on the module)
- One RS-232 console port
- One USB port, supporting USB v3.0 and v2.0 speeds

The management module also contains the following system health LEDs (chassis LEDs) that provide visual indicators of operational and performance status of the fabric interconnect:

- ENV is the environmental LED, which indicates the status of cooling and power in the fabric interconnect.

- STS is the Status LED, which indicates the boot-time or run-time operational state of the fabric interconnect.
- BCN is the Beacon LED, which identifies a specific fabric interconnect in a rack or back of network equipment.

The same set of LED exists on the chassis front panel. For information about these LEDs, see Chassis LEDs, on page 4.

Fan Modules

The fabric interconnect features four fan modules, numbered from left to right starting at fan 1. Each fabric interconnect fan module supports the following:

- Port-side exhaust airflow only with blue coloring (UCS-FAN-6664).
- Standard operation at the following fan speeds:
  - Typical/minimum: 45% of maximum RPMs.
  - Maximum: 80% of maximum RPMs.



Note

- When more than one fan module fails, major alarm is raised and a graceful shut down is performed within two minutes, unless the fan module is restored.
- The fabric interconnect functions normally when only one fan fails. If more than one fan fails, the fabric interconnect issues a warning and powers down within two minutes.

Each fan has a status LED that provides a visual indicator of operational and performance information. For information, see Fan Module LEDs, on page 7.

Power Supplies

The fabric interconnect features two redundant (1+1) power supplies (PSUs). Power supplies are arranged vertically with power supply 1 on top. One PSU can power the fabric interconnect, but it is a best practice to only operate the fabric interconnect with one PSU for short periods of time, for example, while swapping out a fan.

The fabric interconnect supports 1400W port-side exhaust AC power supply modules with blue coloring (UCS-PSU-6600-AC).

Each power supply has a status LED that provides a visual indicator of operational and performance information. For information, see Power Supply LEDs, on page 7.

Power Supply and Fan Considerations

The fabric interconnect supports fan and power supply modules with port-side exhaust airflow. Fans and PSUs with port-side exhaust are color coded blue.

The fan and power supply modules are field replaceable and you can replace one fan module or one power supply module during operations so long as the other modules are installed and operating. If you have only one power supply installed, you can install the replacement power supply in the open slot before removing the original power supply.

Note

- All the fan modules and power supplies must use the same airflow direction. Otherwise, the fabric interconnect can overheat and shut down

Caution For port-side exhaust airflow (blue coloring for fan modules), you must locate the ports in the hot aisle. If you locate the air intake in a hot aisle, the fabric interconnect can overheat and shut down.

Fan Module LEDs

The fan module status LED is located below the air holes on the front of the fan module. Every fan module has an LED.

LED	Color	Status
Status	Green	The fan module is operational.
	Red	The fan module is not operational (fan is probably not functional).
	Off	Fan module is not receiving power.

Power Supply LEDs

The power supply LEDs are located on the right portion of the power supply. Combinations of states indicated by the OK and Fault LEDs signify the status for the module as shown in this table.

OK LED	FAIL or FAIL/ID LED	Status
Green	Off	Power supply is on and outputting power to the fabric interconnect.
Flashing green	Off	Power supply is connected to a power source but not outputting power to the fabric interconnect. The power supply may not be properly installed in the chassis.
Off	Off	Either all the installed power supplies are not receiving power or an uninstalled power supply is not receiving power.
Off	Flashing amber	Power supply is operating but a warning condition has occurred—possibly one of these conditions: • High temperature • High power • Slow power supply fan • Low voltage • Power supply is installed in the chassis but was disconnected from the power source.

OK LED	FAIL or FAIL/ID LED	Status
Off	Flashing amber (10 seconds) then amber	Power supply is installed without a connection to a power source.
Off	Amber	Power supply failure—possibly one of these conditions: • Over voltage • Over current • Over temperature • Power supply fan failure

Ports and Port Numbering

Ports

The Cisco UCS 6664 Fabric Interconnect has these ports:

- Gigabit Ethernet (GbE) ports:
  - Ports 1 through 24 are QSFP ports that support Gigabit Ethernet links at the following speeds:
    - 10 Gbps using QSA transceivers
    - 25 Gbps using QSA28 transceivers
    - 40Gbps and 100Gbps using an appropriate cable or transceiver
  - Ports 25 through 40 are unified ports that support Gigabit Ethernet or Fibre Channel through SFP port transceivers at the following link speeds:
    - Fibre Channel: 16Gbps, 32Gbps, or 64Gbps
    - Gigabit Ethernet: 10Gbps, 25Gbps, or 50 Gbps



Note With version 6.0.2 and later, the Cisco UCS 6664 Fabric Interconnect supports 50 Gbps Gigabit Ethernet on unified ports.

  - Ports 41 through 64 are QSFP ports that support Ethernet at the following speeds:
    - 10 Gbps using QSA transceivers
    - 25 Gbps using QSA28 transceivers
    - 40Gbps and 100Gbps using an appropriate cable or transceiver

- Ports 49 through 64 are recommended as uplinks and support Media Access Control Security (MACsec) as defined by IEEE standard 802.1AE. MACsec is supported on Gigabit Ethernet links or uplinks, but not FCoE links or uplinks.

- Fibre Channel Ports: Ports 25-40 support standard Fibre Channel links, as well as Gigabit Ethernet links through SFP port transceivers. These are the only ports on the Fabric Interconnect that support standard FC traffic.
  - Fibre Channel: 16Gbps, 32Gbps, or 64Gbps.
  - Gigabit Ethernet or Fibre Channel over Ethernet: 10Gbps or 25Gbps

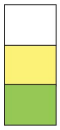
- All ports that support Gigabit Ethernet also support FibreChannel over Ethernet (FCoE) traffic.

To determine which transceivers, adapters, and cables are supported by this fabric interconnect, see the Cisco Transceiver Modules Compatibility Information document.

Port Numbering

Ports numbers are labeled on the chassis for easy reference. Different ports numbers support different connection types as indicated on the chassis by color coding. See the following illustration.

1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61
2	6	10	14	18	22	26	30	34	38	42	46	50	54	58	62
3	7	11	15	19	23	27	31	35	39	43	47	51	55	59	63
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64



QSFP Ports: 40/100 GbE or FCoE Ports, or 10/25 GbE Ports by QSA or QSA28
SFP Ports: 10/25 GbE or FCoE Ports, or 16/32/64G FC Ports (Unified Ports)
QSFP Ports: 40/100 GbE or FCoE Ports, or 10/25 GbE Ports by QSA or QSA28 MACSec capable
Recommended Uplink Ports

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Overview About Cisco UCS 6652 Fabric Interconnect

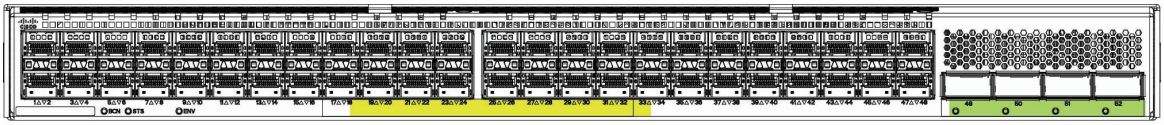
The Cisco UCS 6600 Series Fabric Interconnect product family consists of the Cisco UCS 6652 Fabric Interconnect and Cisco UCS 6664 Fabric Interconnect. This overview is for the Cisco UCS 6652 Fabric Interconnect. For information about the Cisco UCS 6664 Fabric Interconnect, see Overview About Cisco UCS 6664 Fabric Interconnect.

The Cisco UCS 6652 Fabric Interconnect (fabric interconnect) is a 1-RU top-of-rack switch that mounts in a standard 19-inch rack. The 6652 is a 10/25/50/40/100/400 Gbps Gigabit Ethernet, FCoE and 16/32/64G Fiber Channel switch offering up to 8.44 Tbps throughput and up to 52 ports. The switch has 16 unified ports (port numbers 17-32) that can support either 10/25/40/50 Gbps SFP28 Ethernet ports or 16/32/64-Gbps Fibre Channel ports, 32 10/25/50 Gbps Ethernet SFP28 ports (port numbers 1-16 and 33-48) and four uplink ports that can support 40/100/400 Gbps QSFP-DD Ethernet uplink (port numbers 49-52).

The Cisco UCS 6652 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 fabric interconnect contains its own environmentals, such as power supplies and fans, on the rear panel of the chassis.

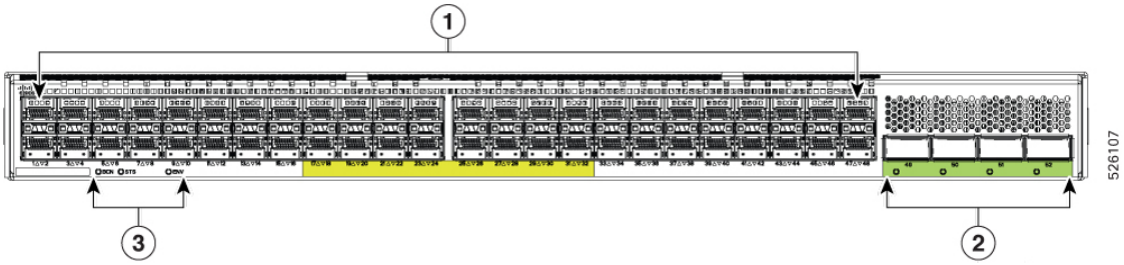
- Power supplies are redundant (1+1) that load share while both PSUs are operational, but a single PSU can power the entire fabric interconnect as needed, for example, during a PSU swap out.
- Fans are also redundant (N+1) and load sharing, and they are color-coded to show intake airflow from the cold aisle to exhaust to the hot aisle in the data center (port-side exhaust air flow). Fans are grouped as two fans per fan module with five total modules per fabric interconnect for a total of ten fans per system.



Fabric Interconnect Front Panel

The Cisco UCS 6652 Fabric Interconnect front panel contains the following fabric ports and system LEDs.

- Fabric ports can be Gigabit Ethernet (GbE), Fibre Channel (FC), or Fibre Channel over Ethernet (FCoE). Typically, ports support only GigE or FCoE. However, some ports, called Unified Ports, can support all three connection types. For information about which ports support which connection types, and what speeds the ports support, see Ports and Port Numbering, on page 15.
- System LEDs provide visual indicators of the operational states of the systems. For more information, see Chassis LEDs, on page 11.



The following table shows the contents of the Cisco UCS 6652 Fabric Interconnect front panel. Ports are arranged in vertical columns as two pairs of ports.

1	SFP Ports 1 to 48. Ports are arranged vertically in pairs.
2	MACsec-capable QSFP-DD ports 49 to 52.
3	Beacon (BCN), Status (STS), and Environment (ENV) LEDs

Chassis LEDs

The BCN, STS, and ENV LEDs are located on the left side of the front of the fabric interconnect. The port LEDs appear as triangles pointing up or down to the nearest port.

LED	Color	Status
BCN	Flashing blue	The operator has activated this LED to identify this fabric interconnect in the chassis.
	Off	This fabric interconnect is not being identified.
STS	Green	The fabric interconnect is operational.
	Flashing amber	The fabric interconnect is booting up.
	Amber	Temperature exceeds the minor alarm threshold.
	Red	The fabric interconnect is not operational or temperature exceeds the major alarm threshold.
	Off	The fabric interconnect is not receiving power.
ENV	Green	Fans and power supply modules are operational.
	Amber	At least one fan or power supply module is not operating.
(port)	Green	Port admin state is 'Enabled', SFP is present and the interface is connected (that is, cabled, and the link is up).
	Amber	Port admin state is 'Disabled, or the SFP is absent, or both.
	Off	Port admin state is 'Enabled' and SFP is present, but interface is not connected.

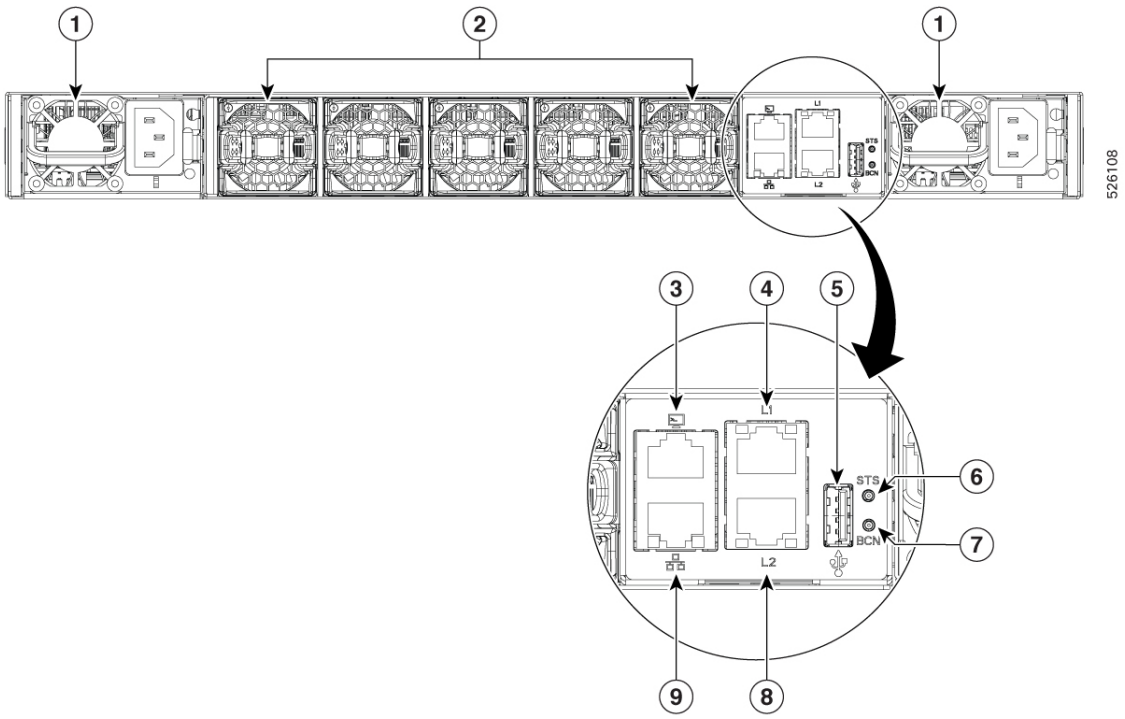
Uplink Module LEDs

There is a Status LED below each uplink port.

LED	Color	Status
QSFP Port State	Green	Port admin state is Enabled. The SFP is present, and the interface is connected (cabled and the link is up)
	Amber	Port admin state is Disabled or the SFP is absent, or both
	Off	Port admin state is Enabled, and the SFP is present, but interface is not connected

Fabric Interconnect Rear Panel

The Cisco UCS 6652 Fabric Interconnect rear panel contains the management module, fans, and power supplies.



1	Power Supply 1 and Power Supply 2	**2**	Fan Modules, numbered one through five with fan 1 on the left and fan five on the right.
3	Console Port	**4**	L1 Port
5	USB Port	**6**	STS
7	BCN	**8**	L2 Port
9	Management Port		

Management Module

The management module enables connection to the fabric interconnect through any of the following:

- One RJ-45 Ethernet MGMT port for management console connectivity, supporting 10/100/1000Mb speeds (labeled MGMT on the module)
- Two L1/L2 Ethernet RJ-45 ports for high availability or cluster configurations, supporting 10/100/1000Mb speeds (labeled L1 and L2 on the module)
- One RS-232 console port
- One USB port, supporting USB v3.0 and v2.0 speeds

The management module also contains the following system health LEDs (chassis LEDs) that provide visual indicators of operational and performance status of the fabric interconnect:

- ENV is the environmental LED, which indicates the status of cooling and power in the fabric interconnect.

- STS is the Status LED, which indicates the boot-time or run-time operational state of the fabric interconnect.
- BCN is the Beacon LED, which identifies a specific fabric interconnect in a rack or back of network equipment.

The same set of LED exists on the chassis front panel. For information about these LEDs, see Chassis LEDs, on page 11.

Fan Modules

The Cisco UCS 6652 Fabric Interconnect features four fan modules, numbered from left to right starting at fan 1. Each fan module supports the following:

- Port-side exhaust airflow only with blue coloring (UCS-FAN-6652).
- Standard operation at the following fan speeds:
  - Typical/minimum: 45% of maximum RPMs.
  - Maximum: 80% of maximum RPMs.



Note

- When more than one fan module fails, major alarm is raised and a graceful shut down is performed within two minutes, unless the fan module is restored.
- The fabric interconnect functions normally when only one fan fails. If more than one fan fails, the fabric interconnect issues a warning and powers down within two minutes.

Each fan has a status LED that provides a visual indicator of operational and performance information. For information, see Fan Module LEDs, on page 14.

Power Supplies

The Cisco UCS 6652 Fabric Interconnect features two redundant (1+1) power supplies (PSUs). Power supplies are arranged vertically with power supply 1 on top. One PSU can power the fabric interconnect, but it is a best practice to only operate the fabric interconnect with one PSU for short periods of time, for example, while swapping out a fan.

The fabric interconnect supports 1400W port-side exhaust AC power supply modules with blue coloring (UCS-PSU-6600-AC).

Each power supply has a status LED that provides a visual indicator of operational and performance information. For information, see Power Supply LEDs, on page 14.

Power Supply and Fan Considerations

The fabric interconnect supports fan and power supply modules with port-side exhaust airflow. Fans and PSUs with port-side exhaust are color coded blue.

The fan and power supply modules are field replaceable and you can replace one fan module or one power supply module during operations so long as the other modules are installed and operating. If you have only one power supply installed, you can install the replacement power supply in the open slot before removing the original power supply.

Note

- All the fan modules and power supplies must use the same airflow direction. Otherwise, the fabric interconnect can overheat and shut down

Caution For port-side exhaust airflow (blue coloring for fan modules), you must locate the ports in the hot aisle. If you locate the air intake in a hot aisle, the fabric interconnect can overheat and shut down.

Fan Module LEDs

The fan module status LED is located below the air holes on the front of the fan module. Every fan module has an LED.

LED	Color	Status
Status	Green	The fan module is operational.
	Red	The fan module is not operational (fan is probably not functional).
	Off	Fan module is not receiving power.

Power Supply LEDs

The power supply LEDs are located on the right portion of the power supply. Combinations of states indicated by the OK and Fault LEDs signify the status for the module as shown in this table.

Color	Status
Off	Power supply is not receiving power.
Green	Power Supply ON and power being delivered to system.
Flashing green	Power supply is connected to AC power source but not outputting power to the system.
Amber	Power supply failure—possibly one of these conditions: • Over voltage • Over current • Over temperature • Fan failure
Flashing amber	Power supply is operating but a warning condition has occurred—possibly one of these conditions: • High temperature • High power • Slow fan

Ports and Port Numbering

Ports

The Cisco UCS 6652 Fabric Interconnect has these ports:

- Gigabit Ethernet (GbE) ports:
  - Ports 1 through 16 are SFP ports that support Gigabit Ethernet links at the following speeds:
    - 10Gbps, 25Gbps and 50Gbps using an appropriate cable or transceiver

    These ports support various Ethernet or FCoE port types.
  - Ports 17 through 32 are unified ports that support Gigabit Ethernet, Fibre Channel, or Fibre Channel over Ethernet through SFP port transceivers at the following link speeds:
    - Fibre Channel: 16Gbps, 32Gbps, or 64Gbps
    - Gigabit Ethernet or Fibre Channel over Ethernet: 10Gbps, 25Gbps, or 50Gbps
  - Ports 33 through 48 are SFP ports that support Gigabit Ethernet links at the following speeds:
    - Gigabit Ethernet or Fibre Channel over Ethernet: 10Gbps, 25Gbps, or 50Gbps
  - Ports 49 through 52 are QSFP-DD ports that support Ethernet uplinks:
    - Ports 49 through 52 are uplink ports only. These ports do not support server connections.
    - 40Gbps, 100Gbps, and 400Gbps speeds are supported using an appropriate cable or transceiver.
    - Ports 49 through 52 support Media Access Control Security (MACsec) as defined by IEEE standard 802.1AE. MACsec is supported on Gigabit Ethernet links or uplinks, but not FCoE links or uplinks.
- Fibre Channel Ports: Ports 17-32 support standard Fibre Channel links, as well as Gigabit Ethernet and Fibre channel over Ethernet (FCoE) links through SFP port transceivers. These are the only ports on the Fabric Interconnect that support standard FC traffic.
  - Fibre Channel: 16Gbps, 32Gbps, or 64Gbps.
  - Gigabit Ethernet or Fibre Channel over Ethernet: 10Gbps, 25Gbps or 50Gbps
- All ports that support Gigabit Ethernet also support FibreChannel over Ethernet (FCoE) traffic.

To determine which transceivers, adapters, and cables are supported by this fabric interconnect, see the Cisco Transceiver Modules Compatibility Information document.

Port Numbering

Ports numbers are labeled on the chassis for easy reference. Different ports numbers support different connection types as indicated by color coding on the chassis and in the following illustration.

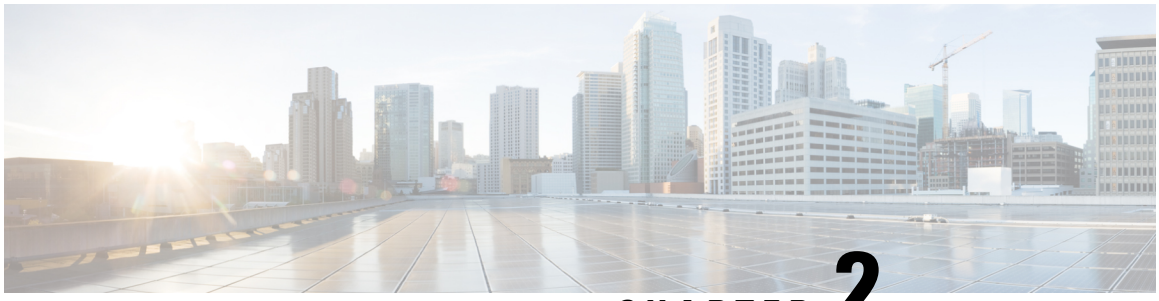
1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52

SFP Ports: 10/25/50 GbE or FCoE Ports

SFP Ports: 10/25/50 GbE or FCoE Ports or 16/32/64G FC Ports (Unified Ports)

QSFP-DD Ports: 40/100/400 GbE or FCoE Ports
MACSec capable
Recommended Uplink Ports

494081



CHAPTER 2

Preparing for Installation

This chapter contains the following topics:

- Cisco UCS Fabric Interconnect 6664 and Cisco UCS Fabric Interconnect 6652 Preparation, on page 17
- Temperature Requirements, on page 18
- Humidity Requirements, on page 18
- Altitude Requirements, on page 19
- Dust and Particulate Requirements, on page 19
- Minimizing Electromagnetic and Radio Frequency Interference, on page 19
- Shock and Vibration Requirements, on page 20
- Grounding Requirements, on page 20
- Planning for Power Requirements, on page 20
- Airflow Requirements, on page 21
- Rack and Cabinet Requirements, on page 21
- Clearance Requirements, on page 22
- Cautions and Regulatory Compliance Statements for NEBS, on page 23

Cisco UCS Fabric Interconnect 6664 and Cisco UCS Fabric Interconnect 6652 Preparation

The Cisco UCS 6600 Series Fabric Interconnect product family consists of the following different models.

Model	Cisco PID	Notes
Cisco UCS 6664 Fabric Interconnect	UCS-FI-6664	2 rack-unit (2U) chassis supporting Ethernet, FCoE, and FC ports. MACsec enabled.
Cisco UCS 6652 Fabric Interconnect	UCS-FI-6652	1 rack-unit (1U) chassis supporting Ethernet, FCoE, and FC. MACsec enabled.

Both models of the Cisco 6600 Series Fabric Interconnect have many similarities when you prepare them for installation. However, there are some differences when you prepare each model for installation, primarily due to the different physical form factor of each.

You can assume that installation preparations are the same for each model unless documentation explains otherwise.

Temperature Requirements

The operating temperature of the fabric interconnect is 32 to 104 degrees Fahrenheit (0 to 40 degrees Celsius). For every 300 meters (1000 feet) above sea level, the maximum temperature is reduced by 1 degree Celsius. The non-operating temperature of the fabric interconnect is -40 to 158 degrees Fahrenheit (-40 to 70 degrees Celsius).

Overview of Module Temperatures

Built-in, automatic sensors in the fabric interconnect monitor your fabric interconnect at all times. Each module has temperature sensors with two thresholds:

- Minor temperature threshold—If exceeded, a minor alarm occurs and these actions happen for all four sensors:
  - System messages display.
  - System sends Call Home alerts (if configured).
  - System sends SNMP notifications (if configured).
- Major temperature threshold—If exceeded, a major alarm occurs and these actions happen:

  For sensors 1, 3, and 4 (outlet and onboard sensors):
  - System messages display.
  - System sends Call Home alerts (if configured).
  - System sends SNMP notifications (if configured).

  For sensor 2 (intake sensor):
  - If the threshold is exceeded on a module, only that module is shut down.
  - If you do not have a standby supervisor module in your fabric interconnect, you have 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages, as configured.

Humidity Requirements

High humidity can cause moisture to enter the fabric interconnect. Moisture can cause corrosion of internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size. The fabric interconnect is rated to withstand from 5- to 95-percent (nonoperating) and 5- to 90-percent (operating) relative humidity.

Climate-controlled buildings usually maintain an acceptable level of humidity for the fabric interconnect equipment. If the fabric interconnect is located in an unusually humid location, use a dehumidifier to maintain the humidity within an acceptable range.

Altitude Requirements

For every 1000 feet (300 meters) elevation, the maximum ambient temperature is reduced by one degree Celsius.

Dust and Particulate Requirements

Exhaust fans cool power supplies. System fans cool fabric interconnects by drawing in air and exhausting air out through various openings in the chassis. Fans also introduce dust and other particles, causing contaminant buildup in the fabric interconnect and increased internal chassis temperature. Dust and particles can act as insulators and interfere with the mechanical components in the fabric interconnect. Keep a clean operating environment to reduce the negative effects of dust and other particles.

In addition to keeping your environment free of dust and particles, use these precautions to avoid contamination of your fabric interconnect:

- Do not smoke near the fabric interconnect.
- Do not eat or drink near the fabric interconnect.

Minimizing Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) from the fabric interconnect can adversely affect other devices, such as radio and television (TV) receivers. Radio frequencies that emanate from the fabric interconnect can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on the fabric interconnect monitor.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the fabric interconnect to other devices through connecting cables, the power cable and power source, or through the air as transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI that are emitted by computing equipment. Each fabric interconnect meets these FCC regulations.

To reduce the possibility of EMI and RFI, use these guidelines:

- Cover all open expansion slots with a blank filler plate.
- Always use shielded cables with metal connector shells for attaching peripherals to the fabric interconnect.

When wires are run for any significant distance in an electromagnetic field, interference can occur to the signals on the wires with these implications:

- Bad wiring can result in radio interference emanating from the plant wiring.
- Strong EMI, especially when it is caused by lightning or radio transmitters, can destroy the signal drivers and receivers in the chassis and even create an electrical hazard by conducting power surges through lines into equipment.

Note To predict and prevent strong EMI, consult experts in radio frequency interference (RFI).

The wiring is unlikely to emit radio interference if you use a twisted-pair cable with a good distribution of grounding conductors. If you exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal, when applicable.

Caution If the wires exceed the recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse that is caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic fabric interconnect. Consult experts in electrical surge suppression and shielding if you have had similar problems in the past.

Shock and Vibration Requirements

The fabric interconnect has been shock- and vibration-tested for operating ranges, handling, and earthquake standards.

Grounding Requirements

The fabric interconnect is sensitive to variations in voltage that is supplied by the power sources. Overvoltage, undervoltage, and transients (spikes) can erase data from memory or cause components to fail. To protect against these types of problems, ensure that there is an earth-ground connection for the fabric interconnect. Connect the grounding pad on the fabric interconnect either directly to the earth-ground connection or to a fully bonded and grounded rack.

When the chassis is properly installed in a grounded rack, the fabric interconnect is grounded because it has a metal-to-metal (no paint, stain, dirt, or anything else on it) connection to the rack. Alternatively, ground the chassis by using a customer-supplied grounding cable that meets your local and national installation requirements. For U.S. installations, we recommend 6-AWG wire. Connect your grounding cable to the chassis with a grounding lug (provided in the fabric interconnect accessory kit) and to the facility ground.

Note Create an electrical conducting path between the product chassis and the metal surface of the enclosure, or rack in which it is mounted, or to a grounding conductor. Provide electrical continuity by using thread-forming type mounting screws that remove any paint or non-conductive coatings and establish a metal-to-metal contact. Remove any paint or other non-conductive coatings on the surfaces between the mounting hardware and the enclosure or rack. Clean the surfaces and apply an antioxidant before installation.

Planning for Power Requirements

The fabric interconnect includes two 1400W AC power supplies with 1-to-1 redundancy and current sharing.

Note For 1+1 redundancy, you must use two power sources and connect each power supply to a separate power source.

The power supplies are rated to output up to 1400 W (AC power supplies) but the fabric interconnect requires less than those amounts of power from the power supply. To operate the fabric interconnect, you must provision enough power from the power source to cover the requirements of both the fabric interconnect and a power supply. Typically, this fabric interconnect and a power supply require 605 W of power input from the power source, but you must provision as much as 1100 W power input from the power source to cover peak demand.

Note Some of the power supply modules have rating capabilities that exceed the fabric interconnect requirements. When calculating your power requirements, use the fabric interconnect requirements to determine the amount of power that is required for the power supplies.

To minimize the possibility of circuit failure, verify that each power-source circuit that is used by the fabric interconnect is dedicated to the fabric interconnect.

Airflow Requirements

The fabric interconnect is positioned with its ports in either the front or the rear of the rack, depending on your cabling and maintenance requirements. To identify the airflow options for your fabric interconnect, see the user-replaceable components in the *Overview* section of this document. Position the fan and power supply modules to move the coolant air from the cold aisle to the hot aisle so that cool air enters the chassis through the fan and power supply modules in the cold aisle and exhausts through the port end of the chassis in the hot aisle.

You can identify the airflow direction of each fan and power supply module by its coloring; blue coloring indicates port-side exhaust airflow.

Note To prevent the fabric interconnect from overheating and shutting down, position the air intake for the fabric interconnect in a cold aisle. The fan and power supply modules must have the same direction of airflow. To change the airflow direction for the fabric interconnect, shut down the fabric interconnect before changing the modules.

Rack and Cabinet Requirements

Install these types of racks or cabinets for your fabric interconnect:

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom-to-top cooling)
- Standard open four-post Telco racks

Work with your cabinet vendors to determine which of their cabinets meet these requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- Use a standard 19-inch (48.3-cm), four-post Electronic Industries Alliance (EIA) cabinet or rack with mounting rails that conform to English universal hole spacing per section 1 of the ANSI/EIA-310-D-1992 standard.
- The depth of a four-post rack must be 24 to 32 inches (61.0 to 81.3 cm) between the front and rear mounting rails (for proper mounting of the bottom-support brackets or other mounting hardware).

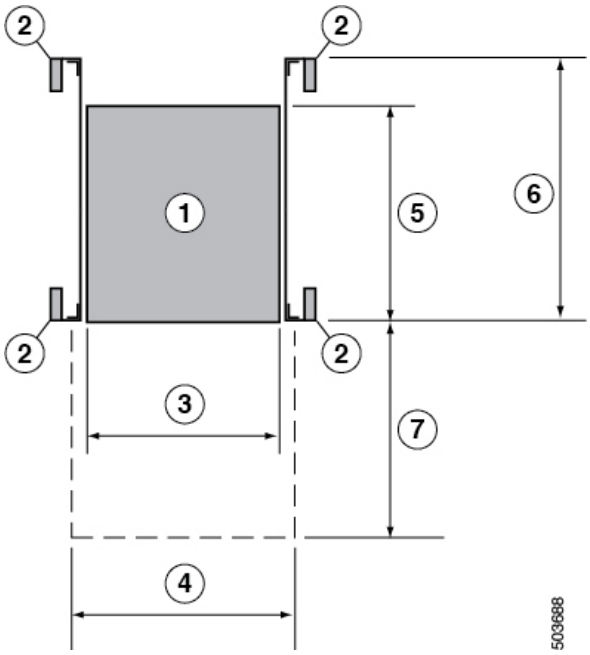
Also, you must have power receptacles that are located within reach of the power cords that are used with the fabric interconnect.

Warning **Statement 1048—**Rack Stabilization

The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before installation or servicing. Failure to stabilize the rack can cause bodily injury.

Clearance Requirements

Provide the chassis with adequate clearance between the chassis and any other rack, device, or structure so that you can properly install the system. Provide the chassis with adequate clearance to route cables, provide airflow, and maintain the fabric interconnect. For the clearances required for an installation of this chassis in a four-post rack, see the figure.



1	Chassis	5	Depth of the chassis

2	Vertical rack-mount posts and rails	6	Maximum extension of the bottom-support rails 36.0 in (91.0 cm)
3	Chassis width 17.3 in (43.9 cm)	7	Depth of the front clearance area (equal to the depth of the chassis).
4	Width of the front clearance area (equal to the width of the chassis with two rack-mount brackets that are attached to it). 19.0 in (43.3 cm)		

Note Both the front and rear of the chassis must be open to both aisles for airflow.

Cautions and Regulatory Compliance Statements for NEBS

The regulatory compliance statements and requirements for the Network Equipment Building System (NEBS) certification are listed here.

Warning The intrabuilding port(s) of the equipment or subassembly must use shielded intrabuilding cabling/wiring that is grounded at both ends.

The following port(s) are considered intrabuilding ports on this equipment:

- RJ-45 Copper Ethernet Ports

Note To comply with the emission and immunity requirements of GR-1089, shielded cables are required for the following ports:

- RJ-45 Copper Ethernet Ports

Warning The intrabuilding port(s) of the equipment or subassembly is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring for more than 6 meters (approximately 20 feet). These interfaces are designed for use as intrabuilding interfaces only (Type 2, 4, or 4a ports as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metallically to an OSP wiring system.

The following ports are considered intrabuilding ports on the equipment:

- RJ-45 Copper Ethernet Ports

Note This equipment is suitable for installations using the CBN.

Note The equipment is designed to boot up in less than 30 minutes provided the neighboring devices are fully operational.

Note This equipment is suitable for installation in network telecommunications facilities.

Note This equipment is suitable for installation in locations where the NEC applies.

Warning Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments, for example, eye loupes, magnifiers, and microscopes, within a distance of 100 mm, may pose an eye hazard.

Warning Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.

Statement 1055—Class 1/1M Laser

Warning Invisible laser radiation is present. Do not expose to users of telescopic optics. This applies to Class 1/1M laser products.



Statement 1056—Unterminated Fiber Cable

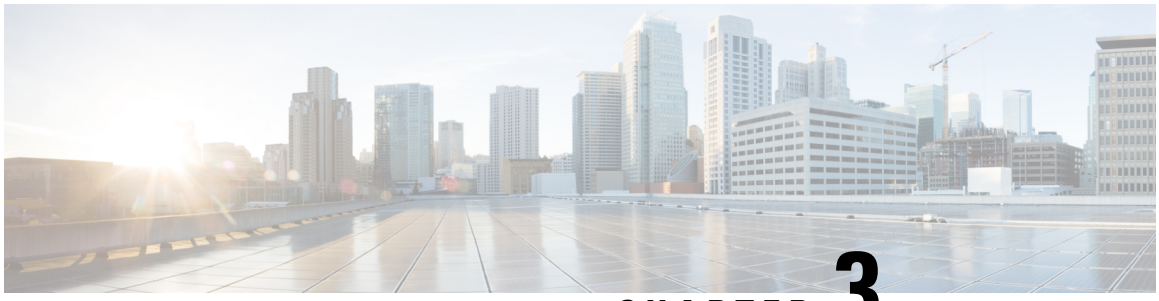
Warning Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments, for example, eye loupes, magnifiers, and microscopes, within a distance of 100 mm, may pose an eye hazard.

Fiber Type and Core Diameter (μm)	Wavelength (nm)	Maximum Power (mW)	Beam Divergence (rad)
SM 11	1200-1400	39-50	0.1-0.11
MM 62.5	1200-1400	150	0.18 NA
MM 50	1200-1400	135	0.17 NA
SM 11	1400-1600	112-145	0.11-0.13

Statement 1051—Laser Radiation



Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.



CHAPTER 3

Installing the Fabric Interconnect

This chapter contains the following topics:

- Cisco UCS Fabric Interconnect 6664 and Cisco UCS Fabric Interconnect 6652 Installation, on page 27
- Installation Options with Rack-Mount Kits, on page 28
- Install a Rack, on page 28
- Unpacking and Inspecting a Fabric Interconnect, on page 29
- Planning How to Position the Fabric Interconnect in the Rack, on page 30
- Installing the Cisco UCS 6664 Fabric Interconnect Using the Rack Installation Kit, on page 30
- Installing the Cisco UCS 6652 Fabric Interconnect Using the Rack Installation Kit, on page 36
- Grounding the Chassis, on page 40
- Starting the Fabric Interconnect, on page 42

Cisco UCS Fabric Interconnect 6664 and Cisco UCS Fabric Interconnect 6652 Installation

The Cisco UCS 6600 Series Fabric Interconnect product family consists of the following different models.

Model	Cisco PID	Notes
Cisco UCS 6664 Fabric Interconnect	UCS-FI-6664	2 rack-unit (2U) chassis supporting Ethernet, FCoE, and FC ports. MACsec enabled.
Cisco UCS 6652 Fabric Interconnect	UCS-FI-6652	1 rack-unit (1U) chassis supporting Ethernet, FCoE, and FC. MACsec enabled.

Both models of the Cisco 6600 Series Fabric Interconnect have many similarities as part of the overall installation process. However, there are some differences, primarily due to the different physical form factor of each.

You can assume that installation are the same for each model unless documentation explains otherwise.

Installation Options with Rack-Mount Kits

The rack-mount kit enables you to install the fabric interconnect into racks of varying depths. Position the fabric interconnect with easy access to either the port connections or the fan and power supply modules.

The rack-mount kit you use depends on the model of fabric interconnect you are installing:

- For the UCS-FI-6664, install the fabric interconnect using rack-mount kit UCS-ACC-6664, which you can order from Cisco. This option for the 2U Fabric Interconnect offers you easy installation, greater stability, increased weight capacity, added accessibility, and improved removability with front and rear removal.
- For the Cisco UCS-FI-6652, install the fabric interconnect using rack-mount kit UCS-ACC-6652, which you can order from Cisco. This option for the 1U Fabric Interconnect offers you easy installation, greater stability, increased weight capacity, added accessibility, and improved removability with front and rear removal.

The rack or cabinet that you use must meet the requirements listed the in General Requirements for Cabinets and Racks, on page 69.

Note You are responsible for verifying that your rack and rack-mount hardware comply with the guidelines that are described in this document.

Install a Rack

Before you install the fabric interconnect, you must install a standard four-post, 19-inch EIA data center rack (or a cabinet that contains such a rack) that meets the requirements listed in Overview of Racks, on page 69.

Procedure

Step 1 Bolt the rack to the concrete subfloor before moving the chassis onto it.

Warning
Statement 1048—Rack Stabilization

The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before installation or servicing. Failure to stabilize the rack can cause bodily injury.

Step 2 If the rack has bonded construction, connect it to the earth ground. This action enables you to easily ground the fabric interconnect and its components and to ground your electrostatic discharge (ESD) wrist strap to prevent damaging discharges when you handle ungrounded components before installing them.

Step 3 Include one or two power sources at the rack. For AC power, provide a power receptacle.

Warning
Statement 1018—Supply Circuit

To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded.

Note
If you are not using power redundancy or are using *n*+1 redundancy, you need only one power source. If you are using *n*+*n* redundancy, you need two power sources.

Unpacking and Inspecting a Fabric Interconnect

Before you install a new chassis, unpack and inspect it to be sure that you have all the items that you ordered. Verify that the fabric interconnect was not damaged during shipment. If anything is damaged or missing, contact your customer representative immediately.

Caution When you handle the chassis or its components, follow ESD protocol at all times to prevent ESD damage. This protocol includes but is not limited to wearing an ESD wrist strap that you connect to the earth ground.

Tip Do not discard the shipping container when you unpack the fabric interconnect. Flatten the shipping cartons and store them. If you need to move or ship the system in the future, you will need this container.

Procedure

Step 1 Compare the shipment to the equipment list that is provided by your customer service representative. Verify that you have received all of the ordered items.

The shipment should include:

- Fabric interconnect, which includes these installed components:
  - Two power supplies (with the airflow direction being the same as for the fan modules):
    - 1400-W AC power supply
      - Port-side exhaust AC power supply with blue coloring (UCS-PSU-6600-AC)
  - Four fan modules (all fan and power supply modules must have the same airflow direction)
    - For the 2U Fabric Interconnect (UCS-FI-6664): Port-side exhaust airflow with blue coloring (UCS-FAN-6664)
    - For the 1U Fabric Interconnect (UCS-FI-6652): Port-side exhaust airflow with blue coloring (UCS-FAN-6652)
- Accessory kit, either UCS-ACC-6664 for the 2U fabric interconnect or UCS-ACC-6652 for the 1U fabric interconnect:

- Rack Mount Kit
- Ground Lug

Step 2 Check the contents of the box for damage.

Step 3 If you notice any discrepancies or damage, send this information to your customer service representative by email:

- Invoice number of the shipper (see the packing slip)
- Model and serial number of the missing or damaged unit
- Description of the problem and how it affects the installation

Planning How to Position the Fabric Interconnect in the Rack

The fabric interconnect is designed so that you can have cool air flow through the fabric interconnect by entering the power supply side and exhausting out the port side (port-side exhaust airflow).

For port-side exhaust airflow, the fabric interconnect must have port-side exhaust fan and AC power supply modules with blue coloring on fan modules and AC power supplies.

Plan the positioning of the fabric interconnect so that its ports are located close to ports on connected devices or so that the fan and power supply modules are conveniently located in a maintenance aisle. Order the modules that move coolant air in the appropriate direction from the cold aisle to the hot aisle.



Note All fan and power supply modules in the same fabric interconnect must operate with the same direction of airflow. The air intake portion of the fabric interconnect must be located in a cold aisle.

Installing the Cisco UCS 6664 Fabric Interconnect Using the Rack Installation Kit

To install the UCS 6664, attach mounting brackets to the rack, install slider rails on the rear of the rack, slide the fabric interconnect onto the slider rails, install the retainer brackets, and secure the fabric interconnect to the rack with the retainer clips. Typically, the front of the rack is the side easiest to access for maintenance.



Note You supply the twelve 10-32 or 12-24 screws required to mount the slider rails and fabric interconnect to the rack.

Before you begin

- Inspect the Cisco UCS 6664 Fabric Interconnect (UCS 6664) shipment to ensure that you have everything ordered.

- Verify that the UCS 6664 rack-mount kit (UCS-ACC-6664) includes these parts:
  - Rack-mount brackets (2)
  - Rack-mount front-mount brackets (2)
  - Rack-mount slider rails (2)
  - Rack-mount retainer clips (2)
  - Flat head screws M4 (6)
  - Flat head screws M3 (4)

Note Twelve Phillis-head pan-screws are required for full installation. You will need to supply these screws. They are not provided in the rack-mount kit.

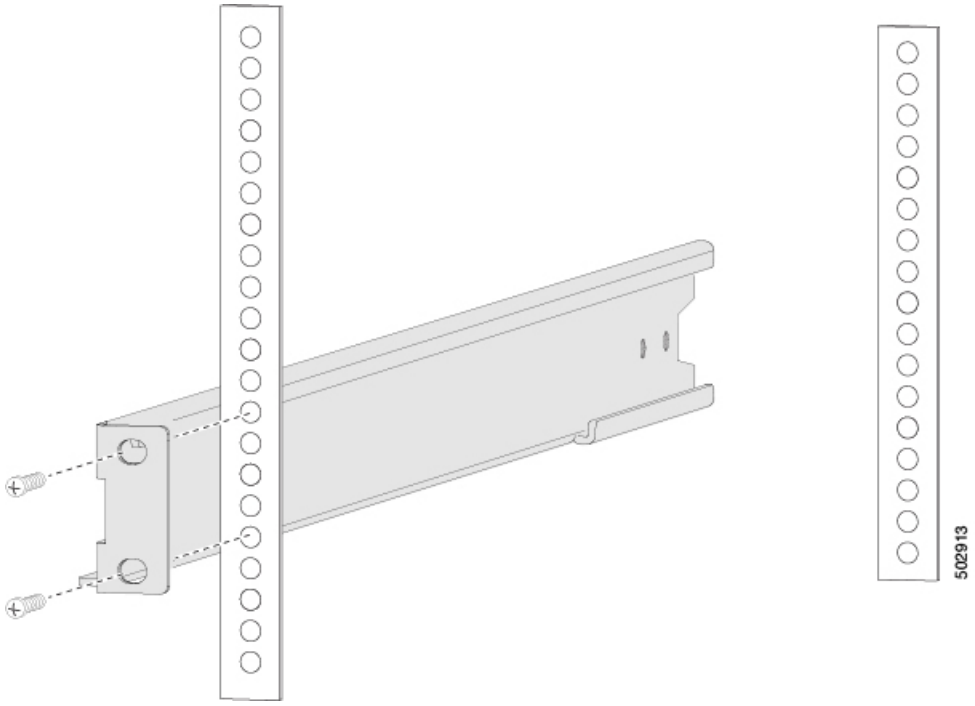
- Verify that the rack is installed and secured to its location.

Procedure

Step 1 Install two rack-mount brackets to the rack.

a) Position the front-mount brackets so that the UCS 6664 fan and power supply modules will be in the cold aisle.

b) Position a front-mount bracket so that it aligns to the desired position in the rack and secure the bracket with 12-24 screws or 10-32 screws, depending on the rack thread type (see the figure). Tighten 12-24 screws to 30 in-lb (3.39 N·m) of torque. Tighten 10-32 screws to 20 in-lb (2.26 N·m) of torque.



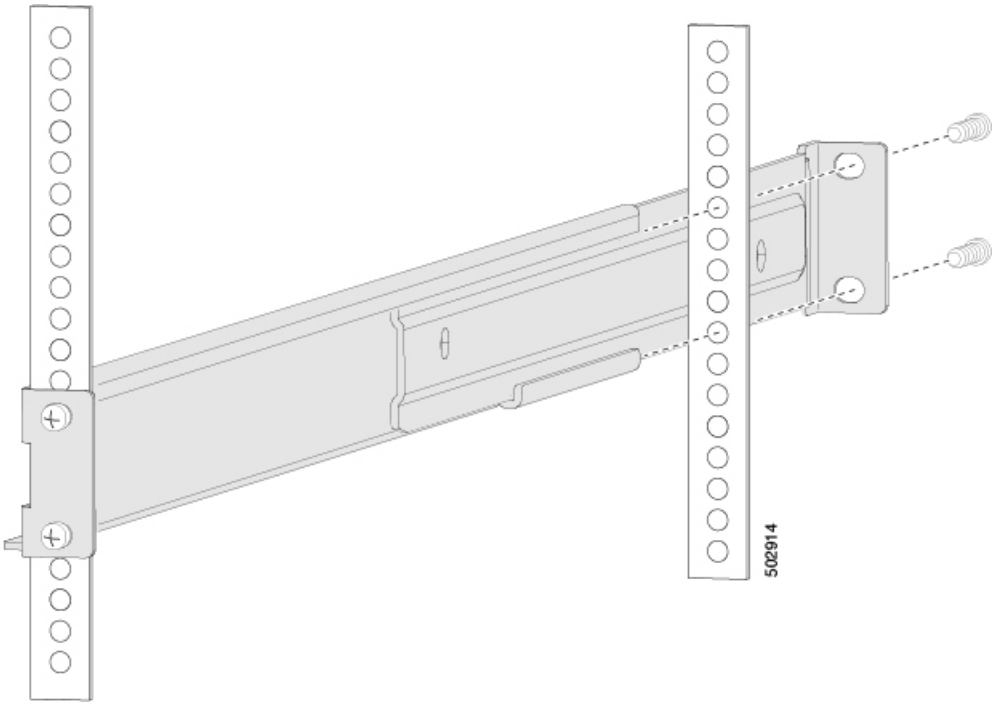
c) Repeat Step 1 for the other front rack-mount bracket on the other side of the rack and be sure to position that bracket horizontally to the same level as the first bracket.

Step 2 If you are not installing the chassis into a grounded rack, attach a customer-supplied grounding wire to the chassis as explained in Grounding the Chassis, on page 40. If you are installing the chassis into a grounded rack, skip this step.

Step 3 Install the slider rails on the rack or cabinet.

a) Determine which two posts of the rack or cabinet you should use for the slider rails. Of the four vertical posts in the rack or cabinet, two will be used for the front mount brackets attached to the easiest accessed end of the chassis. The other two posts will have the slider rails.

b) Position a slider rail at the desired level on the back side of the rack and slide it into the front-mount bracket already installed. Secure with 12-24 screws or 10-32 screws, depending on the rack thread type (see the figure). Tighten 12-24 screws to 30 in-lb (3.39 N·m) of torque. Tighten 10-32 screws to 20 in-lb (2.26 N·m) of torque.

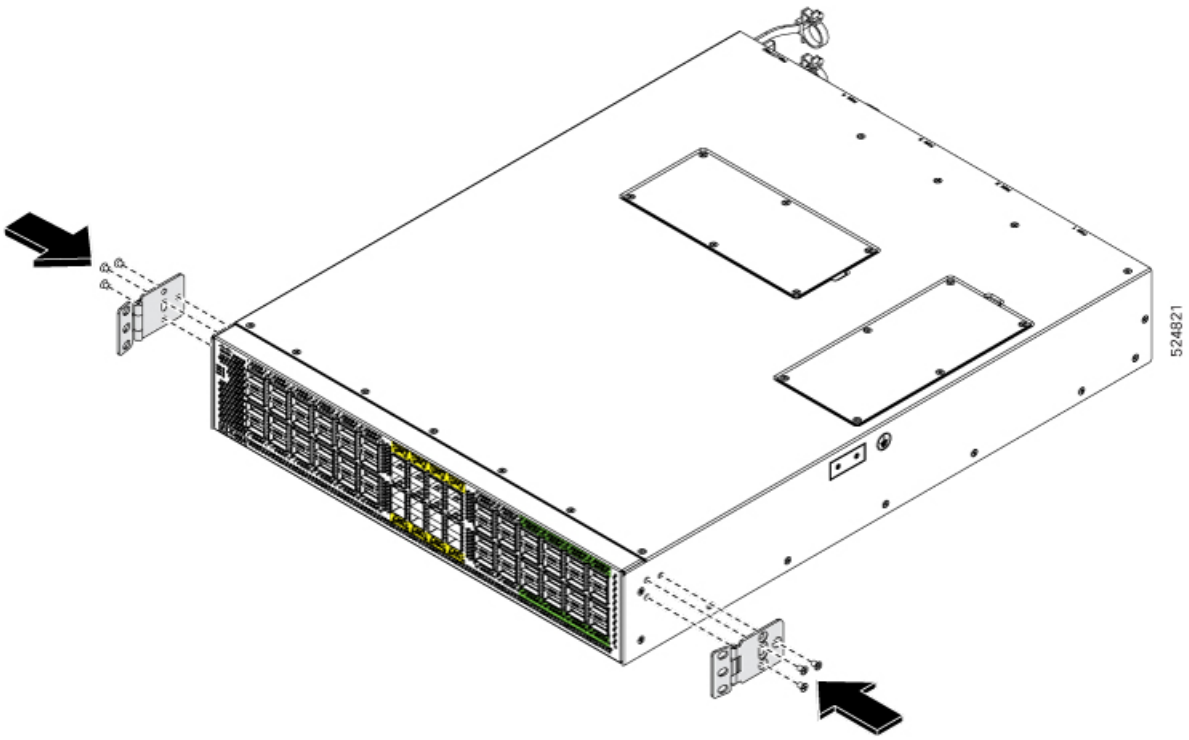


c) Repeat Step 3 to attach the other slider rail to the other side of the rack.

Make sure that the slider rails are at the same level. Use a level tool, tape measure, or carefully count the screw holes in the vertical mounting rails.

Step 4 Insert the UCS 6664 into the rack and attach it.

a) Align the four holes in one side of front mount brackets to three holes on the left or right side of the chassis (see the figure).

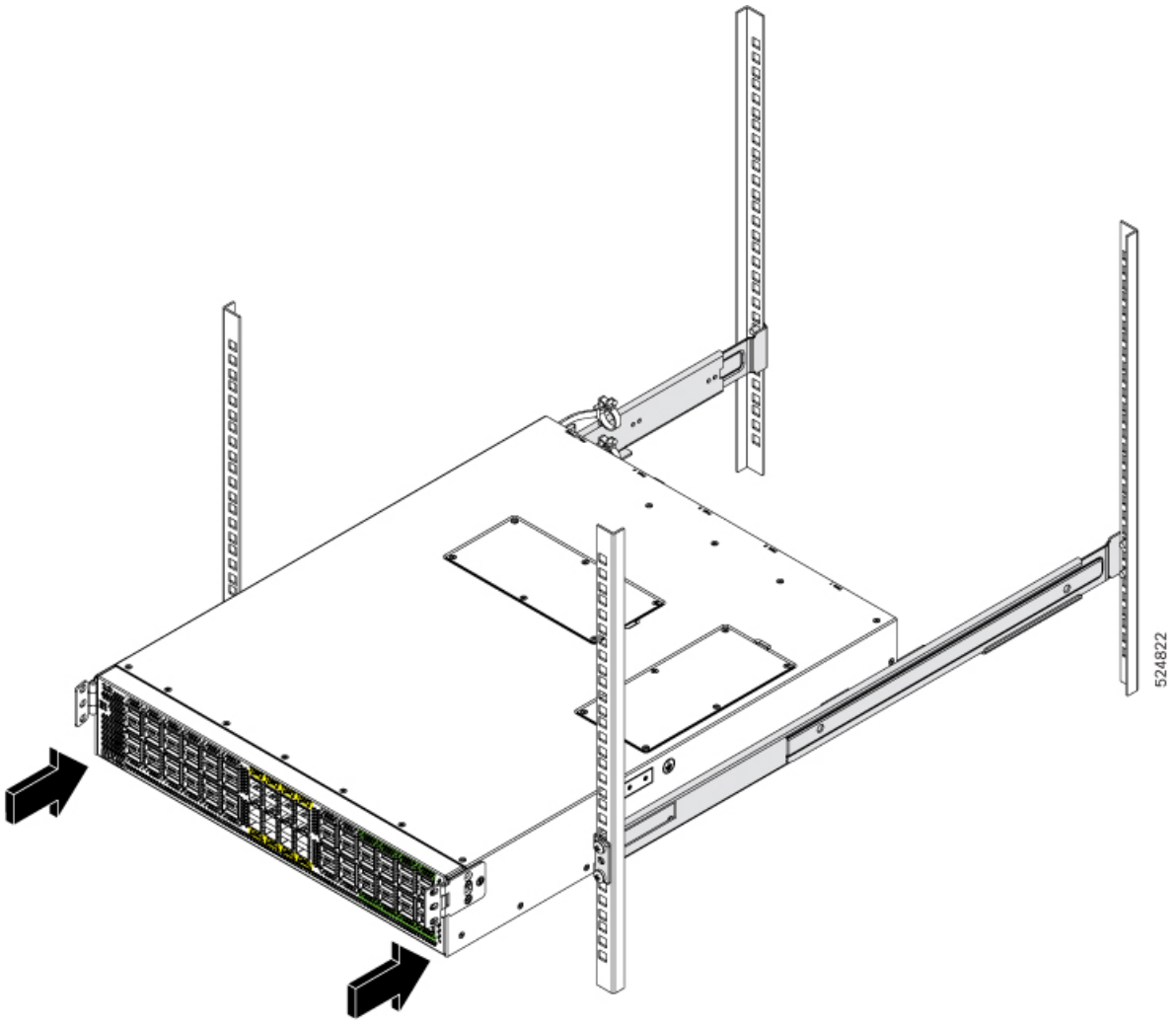


b) Use three M4 x 6 mm screws to attach the bracket to the chassis. Tighten each screw to 11 to 15 in-lb (1.2 to 1.7 N·m).

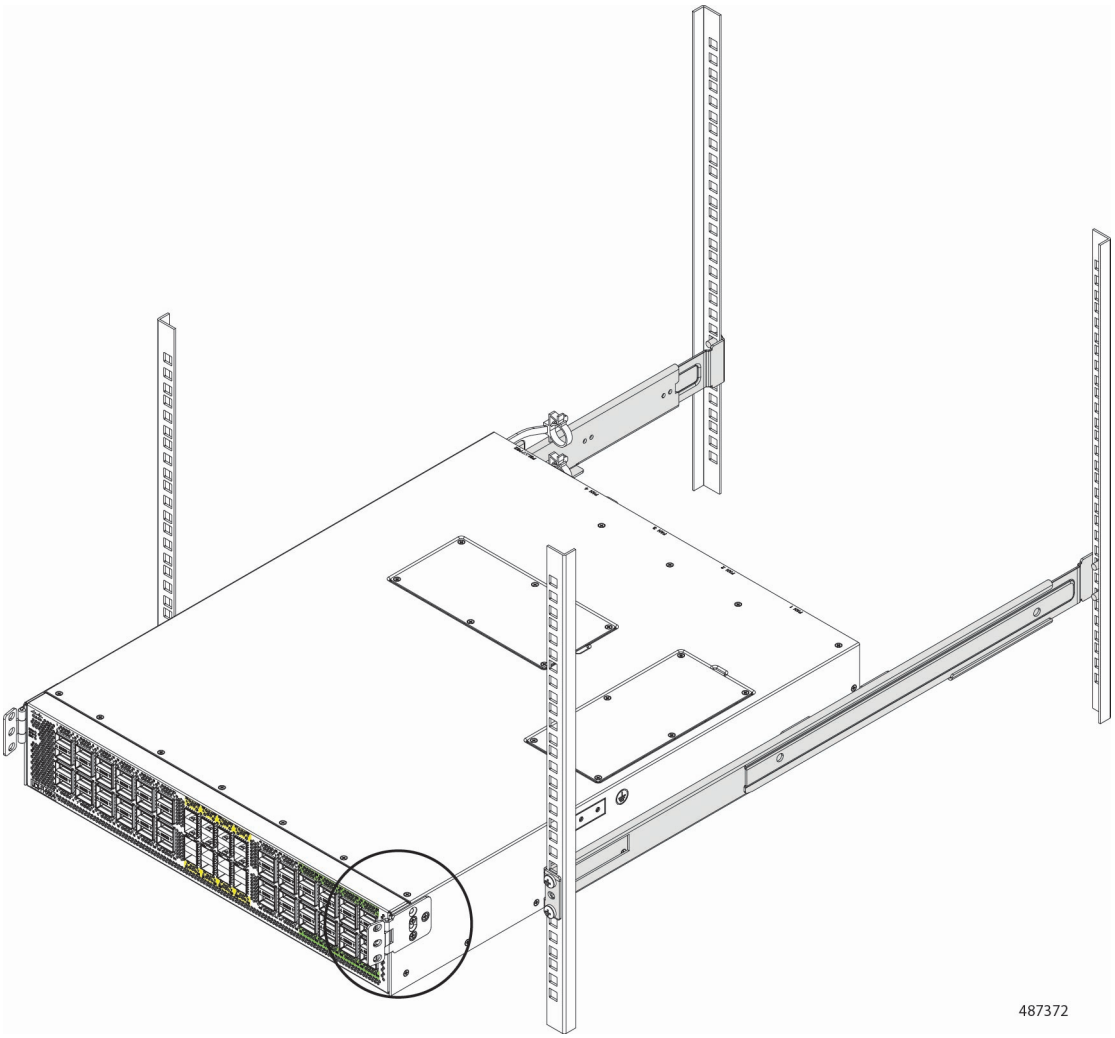
c) Repeat Step 4 to attach the second front mount bracket to the other side of the chassis.

Step 5 Insert the UCS 6664 into the rack and attach it.

a) Holding the UCS 6664 with both hands, position the fabric interconnect onto the rack-mount brackets and carefully slide the chassis into the rack (see the figure).



Step 6 Rotate one front mount bracket so that it fits against the rack.



Step 7 Secure the mounting brackets to the rack.

a) Tighten the 10-32 screws to 20 in-lb (2.26 N·m) or tighten the 12-24 screws to 30 in-lb (3.39 N·m).

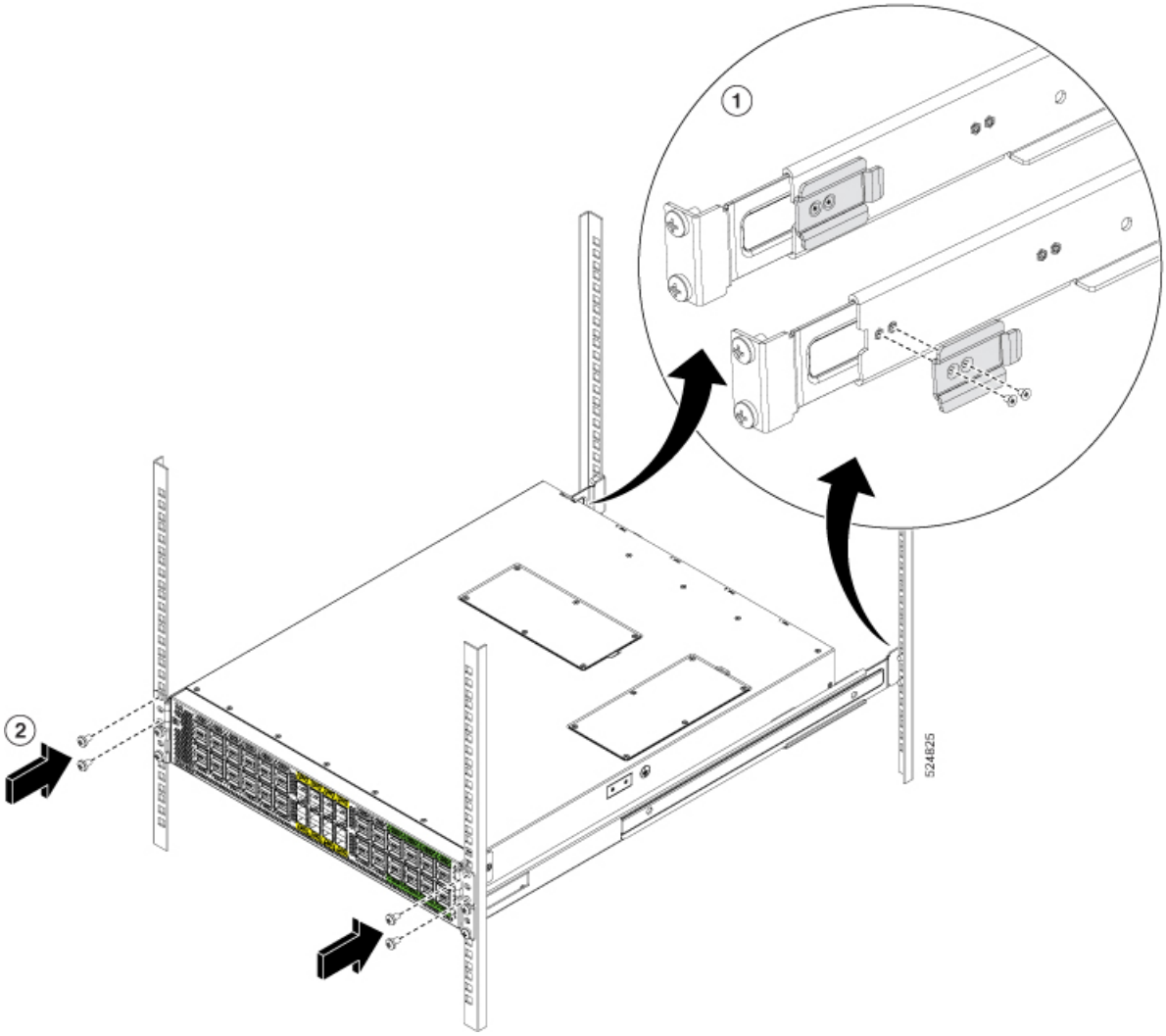
b) Repeat Step 6 to attach the other front mount bracket on the other side of the chassis.

Note
You might need to slide the chassis out of the rack a short distance to allow clearance to rotate the mounting bracket into the correct position to attach it to the rack.

Step 8 Insert the retainer clip to hold the chassis in place.

a) Align the retainer clip to the inside of the back of the slider rail. Make sure to hook the flange to the cutout on the bracket and align the screw holes (see the figure).

b) Attach the two M3 X 4mm screws to secure the retainer clip (see the figure).



c) Repeat Step 7 to attach the other retainer clip on the other side of the chassis.

What to do next

Provide grounding for the fabric interconnect.

Go to Grounding the Chassis, on page 40.

Installing the Cisco UCS 6652 Fabric Interconnect Using the Rack Installation Kit

To install the UCS 6652, attach the front mounting brackets to the fabric interconnect and secure the fabric interconnect to the front of the rack. Typically, the front of the rack is the side easiest to access for maintenance.

Note You must supply twelve 10-32 or 12-24 screws, depending on your rack type. These screws are required to secure the rails to the rack.

Before you begin

- Inspect the Cisco UCS 6652 Fabric Interconnect (UCS 6652) shipment to ensure that you have everything ordered.
- Make sure that the UCS 6652 rack-mount kit includes these parts:
  - Front rack-mount brackets (2)
  - Rear rack-mount brackets (2)
  - Slider rails (2)
  - M4 x 0.7 x 7-mm Phillips countersink screws (10). You will use eight of these screws to install the chassis into the rack.
- Make sure that the rack is installed and secured to its location.

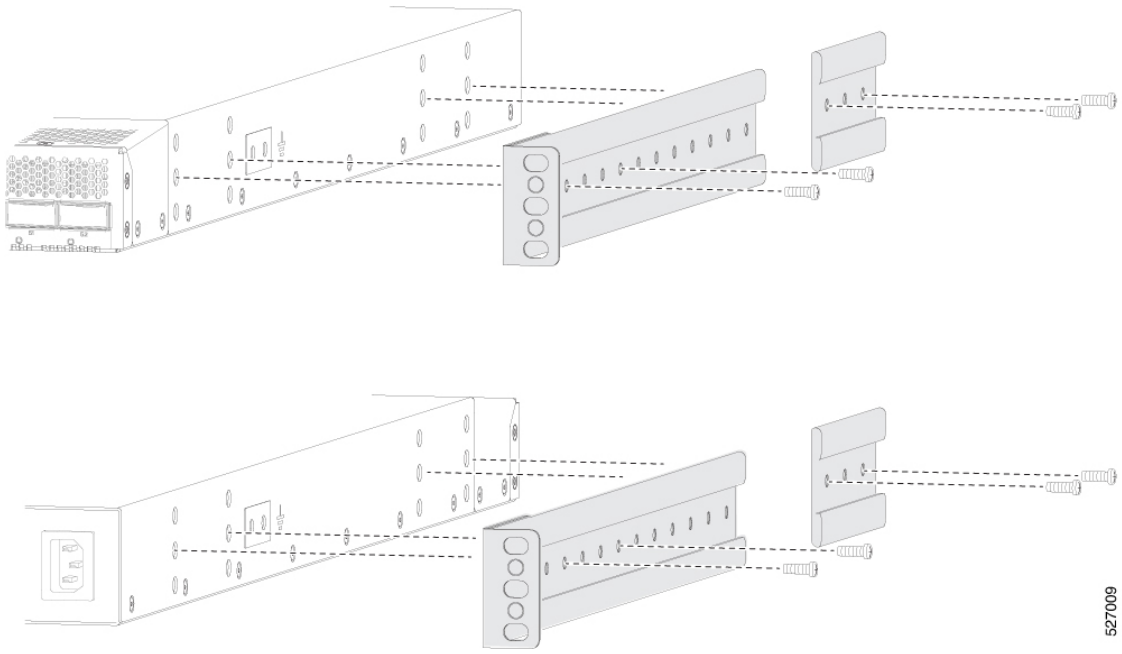
Procedure

Step 1 Install two front rack-mount brackets and the two rear rack-mount brackets to the fabric interconnect as follows:

a) Position the UCS 6652 so that its fan and power supply modules will be in the cold aisle.

b) Position the front rack-mount bracket and the rear rack-mount bracket so that its screw holes are aligned to the screw holes on the side of the chassis.

Note
You can align the holes in the rack-mount bracket to the holes on the side of the chassis (see the two ways to mount these brackets on a typical chassis, in following figure). The holes that you use depend on the requirements of your rack and the amount of clearance required for interface cables (3 inches [7.6 mm] minimum) and module handles (1 inch [2.5 mm] minimum).



c) Secure the front-mount bracket and the back-mount bracket to the chassis using four M4 screws and tighten each screw to 12 in-lb (1.36 N·m) of torque.

d) Repeat Step 1 for the other front rack-mount bracket and the other back-mount bracket on the other side of the fabric interconnect and be sure to position that bracket the same distance from the front of the fabric interconnect.

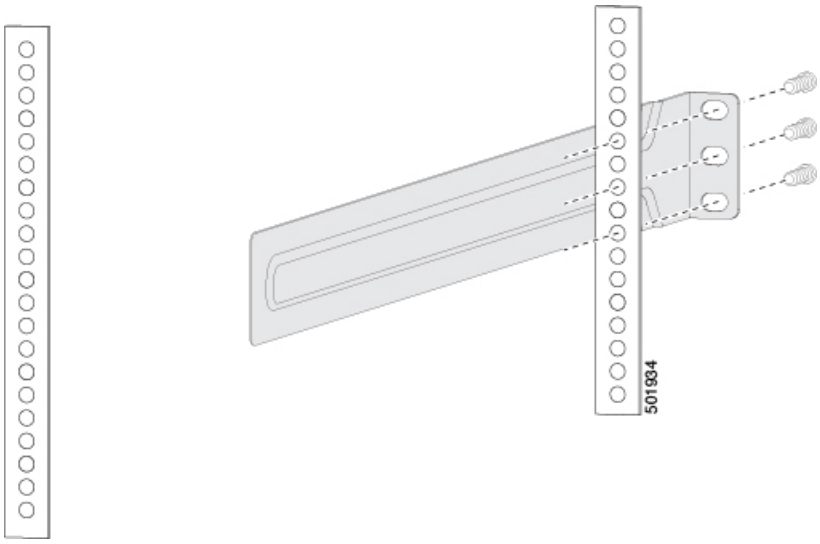
Note
Depending on the chassis depth, the back rack-mount bracket may not fit. In that case the back rack-mount bracket is not needed.

Step 2 If you are not installing the chassis into a grounded rack, you must attach a customer-supplied grounding wire to the chassis as explained in Grounding the Chassis, on page 40. If you are installing the chassis into a grounded rack, you can skip this step.

Step 3 Install the slider rails on the rack or cabinet as follows:

a) Determine which two posts of the rack or cabinet you should use for the slider rails. Of the four vertical posts in the rack or cabinet, two will be used for the front mount brackets attached to the easiest accessed end of the chassis, and the other two posts will have the slider rails.

b) Position a slider rail at the desired level on the back side of the rack and use 12-24 screws or 10-32 screws, depending on the rack thread type, to attach the rails to the rack (see the following figure). Tighten 12-24 screws to 30 in-lb (3.39 N·m) of torque and tighten 10-32 screws to 20 in-lb (2.26 N·m) of torque.

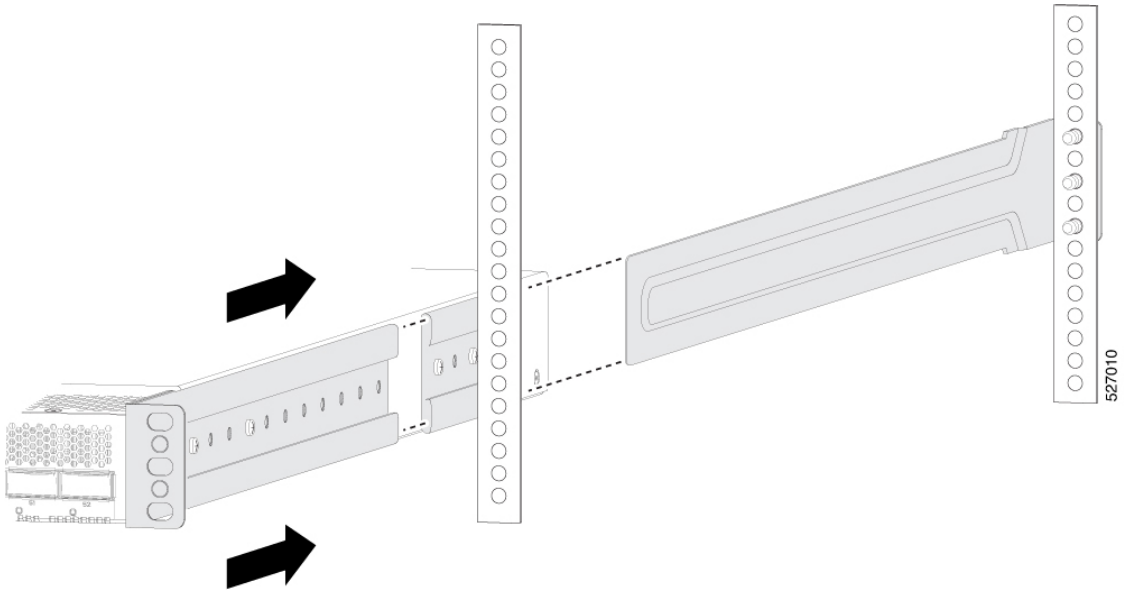


c) Repeat Step 3 to attach the other slider rail to the other side of the rack.

To make sure that the slider rails are at the same level, you should use a level tool, tape measure, or carefully count the screw holes in the vertical mounting rails.

Step 4 Insert the UCS 6652 into the rack and attach it as follows:

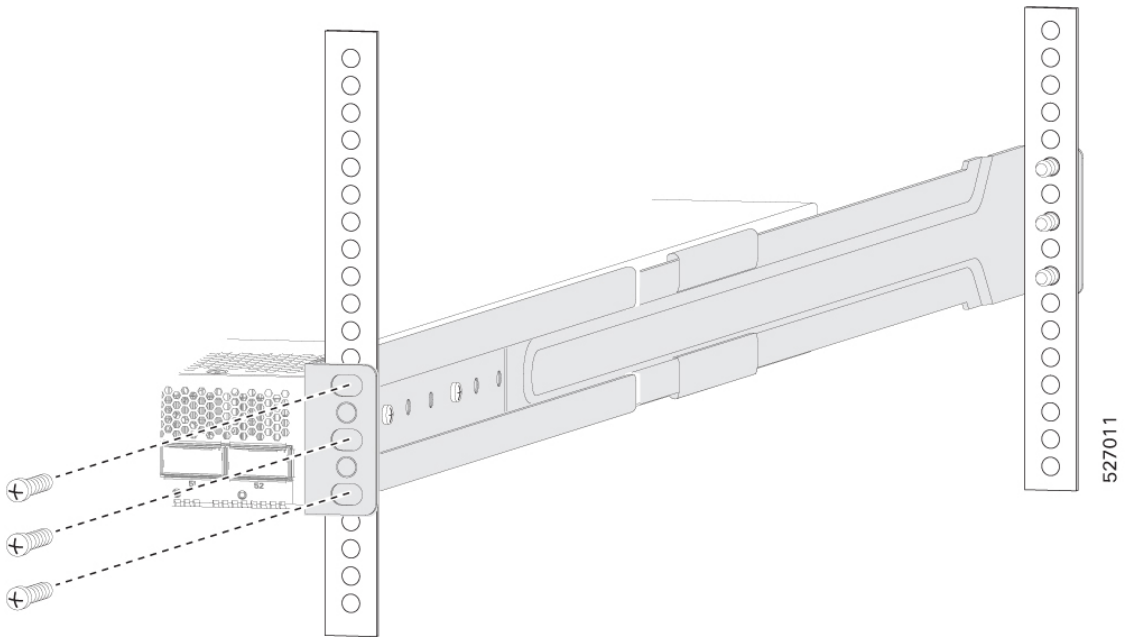
a) Holding the UCS 6652 with both hands, position the two rear rack-mount brackets on the fabric interconnect between the rack or cabinet posts that do not have slider rails attached to them (see the following figure).



b) Align the two rear rack-mount guides on either side of the fabric interconnect with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the UCS 6652 all the way into the rack until the front rack-mount brackets come in contact with two rack or cabinet posts.

Note
If you attached a grounding cable to the chassis, you might need to bend one of the rack-mount rails slightly to allow the grounding lug to go behind the rail.

c) Holding the chassis level, insert screws (12-24 or 10-32, depending on the rack type) in each of the two front rack-mount brackets (using a total of six screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails (see the following figure).



d) Tighten the 10-32 screws to 20 in-lb (2.26 N·m) or tighten the 12-24 screws to 30 in-lb (3.39 N·m).

Step 5 If you attached a grounding wire to the chassis grounding pad, connect the other end of the wire to the facility ground.

Grounding the Chassis

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

Note Provide an electrical conducting path between the product chassis and the metal surface of the enclosure or rack in which it is mounted or to a grounding conductor. To ensure electrical continuity, use thread-forming type mounting screws that remove any paint or non-conductive coatings and establish a metal-to-metal contact. Remove any paint or other non-conductive coatings on the surfaces between the mounting hardware and the enclosure or rack. Clean the surfaces and apply an antioxidant before installation.

Ground the chassis, which is required if the rack is not grounded. Attach a customer-supplied grounding cable. Attach the cable to the chassis grounding pad and the facility ground.

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.

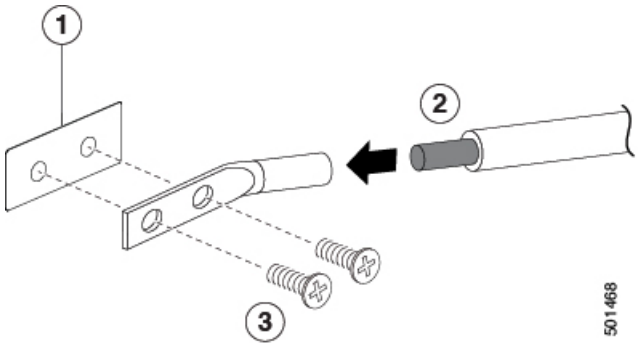
Before you begin

Before you can ground the chassis, connect to earth ground of the data center building.

Procedure

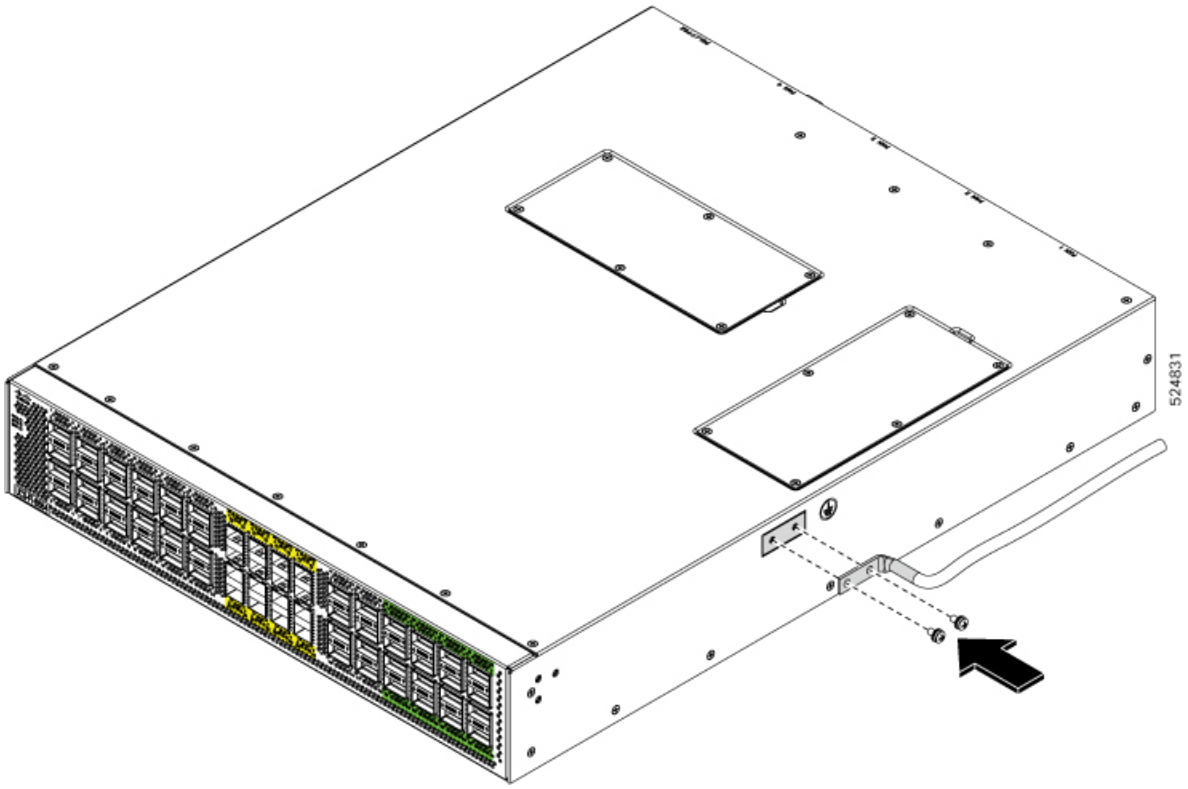
Step 1 Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire. We recommend 6-AWG wire for the U.S. installations.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug. Use a crimping tool to crimp the lug to the wire. See the figure. Verify that the ground wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug (tug test).



1	Chassis grounding pad	3	2 M4 screws are used to secure the grounding lug to the chassis
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		

Step 3 Secure the grounding lug to the chassis grounding pad with two M4 screws, see figure 1. Tighten the screws to 11 to 15 in-lb (1.24 to 1.69 N m) of torque.



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

Starting the Fabric Interconnect

Start the fabric interconnect by connecting it to its dedicated power source. If you need *n*+*n* redundancy, connect each power supply in a fabric interconnect to a different power source.

Note This equipment is designed to boot up in less than 30 minutes, dependent on its neighboring devices being fully up and running.

Before you begin

- The fabric interconnect must be installed and secured to a rack or cabinet.
- The fabric interconnect must be adequately grounded.
- The rack must be close enough to the dedicated power source so that you can connect the fabric interconnect to the power source by using the designated power cables.
- You have the designated power cables for the power supplies that you are connecting to the dedicated power sources.

Note Depending on the outlet receptacle on your AC power distribution unit, you might need an optional jumper power cord to connect the fabric interconnect to your outlet receptacle.

- The fabric interconnect is not connected to the network (this includes any management or interface connections).
- The fan and power supply modules are fully secured in their chassis slots.

Procedure

Step 1 For any AC power supply, do this:

a) Using the recommended AC power cable for your country or region, connect one end to the AC power supply.

b) Connect the other end of the power cable to the AC power source.

Step 2 Verify that the power supply LED is on and green.

Step 3 Listen for the fans; they should begin operating when the power supply is powered.

Step 4 After the fabric interconnect boots, verify that these LEDs are lit:

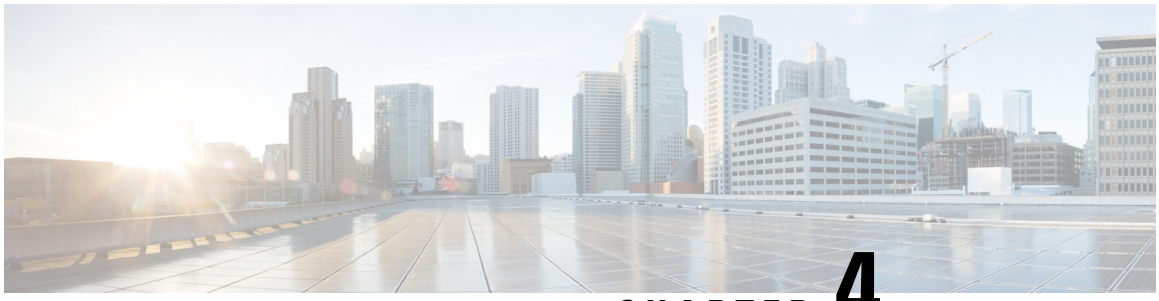
- On the fan modules, the Status (STS) LED is green.

  If a fan module Status LED is not green, try reinstalling the fan module.

- After initialization, the fabric interconnect chassis Status (STS) LED is green.

Step 5 Verify that the system software has booted and the fabric interconnect has initialized without error messages.

A setup utility automatically launches the first time that you access the fabric interconnect and guides you through the basic configuration. For instructions about how to configure the fabric interconnect and check module connectivity, see the configuration guide for the appropriate Cisco management software platform.



CHAPTER 4

Connecting the Fabric Interconnect

This chapter contains the following topics:

- Overview of Network Connections, on page 45
- Connecting a Console to the Fabric Interconnect, on page 46
- Uplink Connections, on page 47
- Creating the Initial Configuration, on page 47
- Setting Up the Management Interface, on page 49
- Connecting to Host Servers, on page 49
- Guidelines for Connecting Ports, on page 50
- Maintaining Transceivers and Optical Cables, on page 51

Overview of Network Connections

The Cisco UCS 6600 Series Fabric Interconnect product family consists of the UCS 6664 and UCS 6652 models. The UCS 6664 is a 2U chassis, and the UCS 6652 is a 1U chassis. Despite being physically different and having different numbers of ports and port layouts, each model has the same types of network connections.

After you install the fabric interconnect in a rack and power it up, you are ready to make the following network connections:

- Console connection—This is a direct local management connection that you use to initially configure the fabric interconnect. You must make this connection first to initially configure the fabric interconnect and determine its IP address, which is needed for the other connections.
- Management connection—After you complete the initial configuration using a console, you can make this connection to manage all future fabric interconnect configurations.
- Uplink and downlink interface connections—These are connections to hosts and servers in the network.

Each of these connection types is explained in one of the sections that follow.



Note When running cables in overhead or subfloor cable trays, we strongly recommend that you locate power cables and other potential noise sources as far away as practical from network cabling that terminates on Cisco equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 feet (1 meter), we recommend that you shield any potential noise sources by housing them in a grounded metallic conduit.

Connecting a Console to the Fabric Interconnect

Before you create a network management connection for the fabric interconnect or connect the fabric interconnect to the network, you must create a local management connection through a console terminal. And then configure an IP address for the fabric interconnect. You can use the console to perform the following functions, each of which can be performed through the management interface after you make that connection:

- Configure the fabric interconnect using the command-line interface (CLI).
- Monitor network statistics and errors.
- Configure Simple Network Management Protocol (SNMP) agent parameters.
- Download software updates.

You make this local management connection between the asynchronous serial port on a supervisor module and a console device capable of asynchronous transmission. Typically, you can use a computer terminal as the console device. On the supervisor modules, you use the console serial port.



Note Before you can connect the console port to a computer terminal, make sure that the computer terminal supports VT100 terminal emulation. The terminal emulation software makes communication between the fabric interconnect and computer possible during setup and configuration.

Before you begin

- The fabric interconnect must be fully installed in its rack, which is connected to a power source, and grounded.
- The necessary cabling for the console, management, and network connections must be available.
  - An RJ-45 rollover cable provided in the fabric interconnect accessory kit.
  - Network cabling is routed to the location of the installed fabric interconnect.

Procedure

Step 1 Configure the console device to match the following default port characteristics:

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

Step 2 Connect an RJ-45 rollover cable to the console port on the fabric interconnect.

You can find this cable in the accessory kit.

Step 3 Route the RJ-45 rollover cable to the console or modem.

Step 4 Connect the other end of the RJ-45 rollover cable to the console or to a modem.

Uplink Connections

The uplink ports (49 through 64) support either uplink to network or storage peer devices as follows:

- For 100-Gigabit Ethernet, use a QSFP28 transceiver in an uplink port (recommended).
- For 40-Gigabit Ethernet, use a QSFP+ transceiver in an uplink port.
- For 25-Gigabit Ethernet, use a QSA28 transceiver in an uplink port.
- For 10 Gigabit-Ethernet, use a QSFP-to-SFP adapter (QSA) and an SFP+ transceiver in an uplink port.

For a list of transceivers and cables used by this fabric interconnect for uplink connections, see http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html.

Statement 1051—Laser Radiation

Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Creating the Initial Configuration

You assign an IP address to the fabric interconnect management interface so that you can then connect the fabric interconnect to the network.

When you initially power up the fabric interconnect, it boots up and asks you a series of questions to configure the fabric interconnect. To connect the fabric interconnect to the network, you can use the default choices for each configuration except the IP address, which you must provide. You can perform the other configurations later through a supported Cisco management platform, such as Cisco Intersight.

Note Know the unique name that is needed to identify the fabric interconnect among the devices in the network.

Before you begin

- A console device must be connected with the fabric interconnect.
- The fabric interconnect must be connected to a power source.
- Determine the IP address and the netmask that is needed for the Management (Mgmt0) interface.

Procedure

Step 1 Power up the fabric interconnect by connecting each installed power supply to an AC circuit.

If you are using the combined or power-supply (*n*+1) power mode, connect all the power supplies to the same AC circuit. If you are using the input-source (*n*+*n*) power mode, connect half of the power supplies to one AC circuit. And connect the other half of the power supplies to another AC circuit.

The Input and Output LEDs on each power supply light up (green) when the power supply units are sending power to the fabric interconnect, and the software asks you to specify a password to use with the fabric interconnect.

Step 2 Enter a new password to use for this fabric interconnect.

The software checks the security strength of your password and rejects your password if it is not considered to be a strong password. To increase the security strength of your password, make sure that it adheres to the following guidelines:

- At least eight characters
- Minimizes or avoids the use of consecutive characters (such as "abcd").
- Minimizes or avoids repeating characters (such as "aaabbb").
- Does not contain recognizable words from the dictionary.
- Does not contain proper names.
- Contains both uppercase and lowercase characters
- Contains numbers and letters

Examples of strong passwords include the following:

- If2CoM18
- 2004AsdfLkj30
- Cb1955S21

Note
Clear text passwords cannot include the dollar sign ($) special character.

Tip
If a password is trivial (such as a short, easy-to-decipher password), the software will reject your password configuration. Be sure to configure a strong password as explained in this step. Passwords are case-sensitive.

If you enter a strong password, the software asks you to confirm the password.

Step 3 Enter the same password again.

If you enter the same password, the software accepts the password and begins asking a series of configuration questions.

Step 4 Until you are asked for an IP address, you can enter the default configuration for each question.

Repeat this step for each question until you are asked for the Mgmt0 IPv4 address.

Step 5 Enter the IP address for the management interface.

The software asks for the Mgmt0 IPv4 netmask.

Step 6 Enter a network mask for the management interface.

The software asks if you need to edit the configuration.

Step 7 Enter **no** not to edit the configuration.

The software asks if you need to save the configuration.

Step 8 Enter **yes** to save the configuration.

What to do next

You can now set up the management interface for each supervisor module on the fabric interconnect.

Setting Up the Management Interface

The management port (MGMT ETH) provides out-of-band management, which enables you to use the command-line interface (CLI) to manage the fabric interconnect by its IP address. This port uses a 10/100/1000 Ethernet connection with an RJ-45 interface.

Before you begin

The fabric interconnect must be powered on.

Procedure

Step 1 Connect the management cable into the management port on the fabric interconnect. For shorter connections, you can use a cable with RJ-45 connectors. For longer connections, you can use an optical cable with SFP transceivers (LH or SX type).

Note
Use only one of these management ports—the fabric interconnect does not support the use of both management ports.

Step 2 Connect the other end of the cable to a 10/100/1000 Ethernet port on a network device.

What to do next

You are ready to connect the interface ports on each of the line cards to the network.

Connecting to Host Servers

To determine which transceivers and cables are supported by this fabric interconnect, see http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html.

To see the transceiver specifications and installation information, see http://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-installation-guides-list.html.

Guidelines for Connecting Ports

For information about the transceivers currently being used with the fabric interconnect, use the **show inventory all** command.

Prevent damage to the fiber-optic cables that can separate from their cables. Keep the transceivers disconnected from their fiber-optic cables when installing the transceiver in the line card. Before removing such a transceiver from the fabric interconnect, remove the cable from the transceiver.

To maximize the effectiveness and life of your transceivers and optical cables:

- Wear an ESD-preventative wrist strap that is connected to an earth ground whenever handling transceivers. The fabric interconnect is typically grounded during installation and provides an ESD port to which you can connect your wrist strap.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep the transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and to prevent damage to the connectors. Contamination causes increased attenuation (loss of light), and should be kept below 0.35 dB.
  - Clean these parts before installation to prevent dust from scratching the fiber-optic cable ends.
  - Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedures.
  - Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.
- To minimize the chance of damaging transceivers when installing them, slide them gently into their fabric interconnect slots. Never force transceivers all the way into the slots. If the transceiver stops part way into the slot, it might be upside down. Remove the transceiver before turning it over and reinstalling it. If positioned correctly, the transceiver slides all the way into the slot and clicks when fully installed.

Statement 1051—Laser Radiation



Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Statement 1055—Class 1/1M Laser

Warning Invisible laser radiation is present. Do not expose to users of telescopic optics. This applies to Class 1/1M laser products.



Statement 1056—Unterminated Fiber Cable

Warning Invisible laser radiation may be emitted from the end of the unterminated fiber cable or connector. Do not view directly with optical instruments. Viewing the laser output with certain optical instruments, for example, eye loupes, magnifiers, and microscopes, within a distance of 100 mm, may pose an eye hazard.

Fiber Type and Core Diameter (μm)	Wavelength (nm)	Maximum Power (mW)	Beam Divergence (rad)
SM 11	1200-1400	39-50	0.1-0.11
MM 62.5	1200-1400	150	0.18 NA
MM 50	1200-1400	135	0.17 NA
SM 11	1400-1600	112-145	0.11-0.13

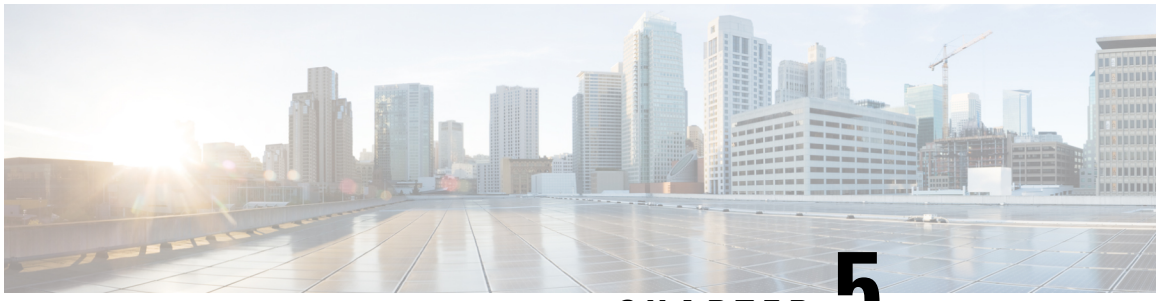
Maintaining Transceivers and Optical Cables

Keep transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and prevent damage to the connectors. Contamination increases attenuation (loss of light) and should be below 0.35 dB.

Consider these maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to the fiber-optic connection cleaning procedures for your site.

- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.



CHAPTER 5

Replacing the Fabric Interconnect

This chapter contains the following topics:

- Replacing the Fabric Interconnect, on page 53

Replacing the Fabric Interconnect

Through Intersight Managed Mode, fabric interconnects can be configured and managed as a pair of peer systems in a UCS domain.

In a UCS domain, both fabric interconnects are active and share connection to other resources. When you remove one fabric interconnect, connectivity and data fails over to the other active fabric interconnect in the domain.

Replacing a fabric interconnect that is managed by Cisco Intersight Managed Mode (IMM) is a straight forward process that occurs by selecting the fabric interconnect(s) and using either of the following Replace options to start the replacement workflow.

- For single fabric interconnect replacement, use the Replace Fabric Interconnect option, which is available by selecting the fabric interconnect to be replaced.
- For dual-fabric interconnect replacement in a UCS domain, use the Replace UCS Domain option, which is available by selecting either of the fabric interconnects to be replaced.

Use the following topics to replace a fabric interconnect. When you receive your new system, install it by following the instructions in Installing the Fabric Interconnect, on page 27.

Preparing a Single Fabric Interconnect for Removal, Intersight

Use Cisco IMM to perform the following task.

Procedure

Ensure that the fabric interconnect you will add has no configuration information.

a) If you are installing a new fabric interconnect from the factory, go to Replacing a Single Fabric Interconnect, Intersight, on page 54.

b) If you are using a fabric interconnect that was previously configured, erase configuration on the fabric interconnect.

Through the fabric interconnect CLI, you can use the **erase configuration** command.

What to do next

Go to Replacing a Single Fabric Interconnect, Intersight, on page 54

Replacing a Single Fabric Interconnect, Intersight

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

Use Cisco UCS Intersight Managed Mode (IMM) to perform software tasks after the new fabric interconnect comes online. For more information, see "Upgrades and RMA of Servers and Fabric Interconnects" in the Cisco Intersight Managed Mode Configuration Guide.

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

Procedure

Step 1 Label the ports and the cables that you are using so that you can refer to this information later. You should use the same cabling and port numbering for the replacement fabric interconnect.

Step 2 Disconnect all the cable connections, including servers, FEX fabrics, and blade chassis, from the old fabric interconnect.

Step 3 Power down the fabric interconnect by unplugging it from the power source.

Step 4 Remove the fabric interconnect from the rack. Follow the instructions in Removing a Cisco UCS Fabric Interconnect From a Rack, on page 59.

Step 5 Install the replacement fabric interconnect into the rack. Follow the instructions in Installing the Fabric Interconnect, on page 27.

Step 6 Connect all the cable connections, including servers, FEX fabrics, and blade chassis, from the old fabric interconnect to the new fabric interconnect.

a) Connect the L1/L2 cables that were disconnected to the replacement fabric interconnect.
b) Connect the data cable according to the labels that you created in Step 2.
c) Connect the power cable to the fabric interconnect and it will automatically boot and run POST tests.

Step 7 Complete the Basic System Configuration Dialog for the new fabric interconnect, replying to the dialog's prompts as necessary.

For an example of the Basic System Configuration Dialog, see Configuring Fabric Interconnect B Using the Console.

- If there is no explicit upgrade required, the newly replaced fabric interconnect syncs the system, management plugin, and device connector images with the peer fabric interconnect while the Basic System Configuration Dialog runs after you answer the prompts.
- If an explicit upgrade is required, proceed to the next step.

Step 8 If necessary, upgrade the software bundles so that the fabric interconnects are in sync.

The Basic System Configuration Dialog will prompt you if updates are required.

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
   Management Mode is  :  intersight

    Local Fabric Interconnect
      Kickstart version            : 9.3(5)I42(1b)
      Management Plugin version    : 1.0.9-255
      local_model_no               : UCS-FI-6536

    Peer Fabric Interconnect
      Kickstart version            : 9.3(5)I42(1b)
      Management Plugin version    : 1.0.9-281
      local_model_no               : UCS-FI-6536


  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>
```

Step 9 Allow the new fabric interconnect to come online.

Step 10 In IMM, find the fabric interconnect that you removed in the Fabric Interconnects list.

Step 11 In the Fabric Interconnects list, click the checkbox to select the fabric interconnect that you removed.

Step 12 Click the Replace Fabric Interconnect icon.

This step starts the Replace workflow, which guides you through decommissioning the fabric interconnect.

Step 13 Follow the workflow to completion.

Step 14 When the workflow is completed:

a) Verify that the Domain Profile is deployed.
b) Check that all discovery and inventory workflows are triggered and successful.
c) Verify that the Server Profile is deployed.

d) Verify that the Chassis Profile is deployed.
e) Ensure that all the correct fabric interconnect policies are configured.
f) Verify that all required ports, port channels, virtual Ethernet and virtual Fibre Channel interfaces are configured and up on both fabric interconnects.
g) Verify that the removed fabric interconnect is deleted from the Fabric Interconnects list.
h) Verify that end-to-end Ethernet connectivity is up.
i) Verify that end-to-end Fibre Channel connectivity is up.
j) Verify that you can launch a virtual KVM session.

Preparing Fabric Interconnects in a UCS Domain For Removal, Intersight

Use Cisco IMM to perform the following tasks:

Procedure

Ensure that the fabric interconnects you will add have no configuration information.

a) If you are installing new fabric interconnects from the factory, go to Replacing Fabric Interconnects in a UCS Domain, Intersight, on page 56.
b) If you are using fabric interconnects that were previously configured, erase the configuration on both fabric interconnects.

   Through the fabric interconnect CLI, you can use the **erase configuration** command.

Replacing Fabric Interconnects in a UCS Domain, Intersight

Use the following procedure when you need to replace a pair of fabric interconnects in the same domain that are the same model of fabric interconnect. For example, a Cisco UCS 6500 Series Fabric Interconnect cannot be paired with a Cisco UCS 6600 Series Fabric Interconnect in the same domain.

In a domain, each fabric interconnect operates as an active online system, not as one live systems and one standby system. If needed, this documentation will differentiate the fabric interconnects by naming them fabric interconnect A and fabric interconnect B.

Use Cisco UCS Intersight Managed Mode (IMM) to perform software tasks after the new fabric interconnects come online. For more information, see "Upgrades and RMA of Servers and Fabric Interconnects" in the Cisco Intersight Managed Mode Configuration Guide.



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

Procedure

Step 1 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 interconnects.

Step 2 Disconnect all the cable connections, including servers, FEX fabrics, and blade chassis, from the old fabric interconnects.

Step 3 Power down the fabric interconnects by unplugging it from the power source.

Step 4 Remove the fabric interconnects from the rack. Follow the instructions in Removing a Cisco UCS Fabric Interconnect From a Rack, on page 59.

Step 5 Install the replacement fabric interconnects into the rack. Follow the instructions in Installing the Fabric Interconnect, on page 27.

Step 6 Connect all the cable connections, including servers, FEX fabrics, and blade chassis, from the old fabric interconnects to the new fabric interconnects.

a) Connect the L1/L2 cables that were disconnected to the replacement fabric interconnects.
b) Connect the data cable according to the labels that you created in Step 2.
c) Connect the power cable to the fabric interconnects, and it will automatically boot and run POST tests.

Step 7 Complete the Basic System Configuration Dialog for the new fabric interconnects, replying to the dialog's prompts as necessary.

Important
When configuring two fabric interconnects in the same UCS domain, make sure to configure the same IP address and domain name.

For an example of the Basic System Configuration Dialog, see Configuring Fabric Interconnect B Using the Console.

- If there is no explicit upgrade required, the newly replaced fabric interconnects can be upgraded through IMM after they are claimed by Intersight, but before the RMA workflow is activated.
- If an explicit upgrade is required, you can perform the upgrade through IMM after the fabric interconnects are claimed by IMM.

Step 8 Complete the Basic System Configuration Dialog for the new fabric interconnect pair.

Important
When configuring two fabric interconnects in the same cluster, make sure to configure the same IP address and domain name.

Step 9 If necessary, upgrade the software bundles so that the fabric interconnects are in sync.

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
    Peer Fabric interconnect management mode   : intersight
    Peer Fabric interconnect Mgmt0 IPv4 Address: 192.168.1.101
    Peer Fabric interconnect Mgmt0 IPv4 Netmask: 255.255.255.0

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

Physical Switch Mgmt0 IP address : 192.168.1.10

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

 Applying configuration. Please wait.
  Configuration file - Ok

XML interface to system may become unavailable since ssh is disabled

  Completing basic configuration setup

2025 Jul  9 18:29:18 K34FishTale-A %$ VDC-1 %$ %SECURITYD-2-FEATURE_NXAPI_ENABLE: Feature nxapi is
 being enabled on HTTPS.

Cisco UCS 6600 Series Fabric Interconnect
```

Step 10 Allow the new fabric interconnects to come online.

Step 11 Claim the new fabric interconnect pair to Intersight.

Step 12 In IMM, in the Fabric Interconnects list, find both fabric interconnects that you replaced.

Step 13 Click the checkbox for either of the fabric interconnects (not both) you are replacing in the domain.

Step 14 Click the Replace UCS Domain Interconnect icon.

This step starts the Replace workflow, which guides you through decommissioning the fabric interconnects.

Step 15 Follow the workflow to completion.

Step 16 When the workflow is completed:

a) Verify that the Domain Profile is deployed for both fabric interconnects.
b) Check that all discovery and inventory workflows are triggered and successful for both fabric interconnects.
c) Verify that the Server Profile is deployed for both fabric interconnects.
d) Verify that the Chassis Profile is deployed for both fabric interconnects.
e) Ensure that all the correct fabric interconnect policies are configured for both fabric interconnects.
f) Verify that all required ports, port channels, virtual Ethernet and virtual Fibre Channel interfaces are configured and up for both fabric interconnects.
g) Verify that both of the removed fabric interconnects are deleted from the Fabric Interconnects list.
h) Verify that end-to-end Ethernet connectivity is up for both fabric interconnects.
i) Verify that end-to-end Fibre Channel connectivity is up for both fabric interconnects.
j) Verify that you can launch a virtual KVM session on both fabric interconnects.

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.

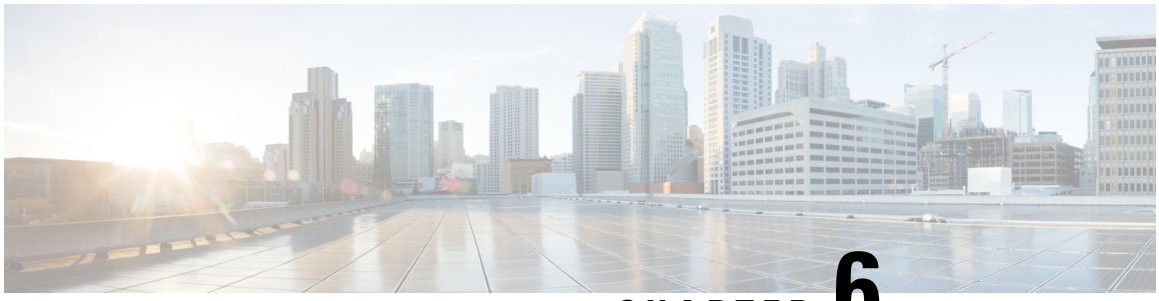
Step 4 Disconnect all cables that are connected to SFP28 transceivers.

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.



CHAPTER 6

Replacing Components

This chapter contains the following topics:

- Cisco UCS Fabric Interconnect 6664 and Cisco UCS Fabric Interconnect 6652 Component Replacement, on page 61
- Replacing a Fan Module During Operations, on page 61
- Replacing a Power Supply Module, on page 64
- Installing and Removing Small-Form Pluggable Modules, on page 67

Cisco UCS Fabric Interconnect 6664 and Cisco UCS Fabric Interconnect 6652 Component Replacement

The Cisco UCS 6600 Series Fabric Interconnect product family consists of the following different models.

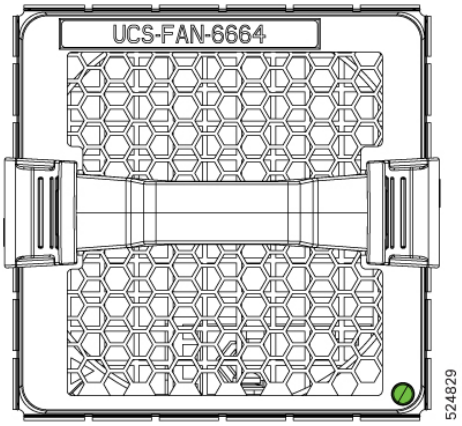
Model	Cisco PID	Notes
Cisco UCS 6664 Fabric Interconnect	UCS-FI-6664	2 rack-unit (2U) chassis supporting Ethernet, FCoE, and FC ports. MACsec enabled.
Cisco UCS 6652 Fabric Interconnect	UCS-FI-6652	1 rack-unit (1U) chassis supporting Ethernet, FCoE, and FC. MACsec enabled.

Both models of the Cisco 6600 Series Fabric Interconnect have similar hardware components that are field-serviceable. You can assume that service procedures are the same for each model unless documentation explains otherwise.

Replacing a Fan Module During Operations

The fabric interconnect contains four fans for proper system cooling. Fans draw intake air from the cool aisle, push it through the chassis, and exhaust the heated air into the hot aisle. Each fan has a Status LED that visually indicates the state of the fan module's health.

To show the location of the Fan Status LED, the following illustration shows a fan for the Cisco UCS 6664 Fabric Interconnect (UCS-FAN-6664). However, the Fan status LED for both the UCS-FAN-6664 and UCS-FAN-6652 is in the same location.



All fan and power supply modules must have the same airflow direction or else an error can occur with the fabric interconnect overheating and shutting down. You can determine the airflow direction of a fan module by the color of the stripe on the front of the module. If the fan module has a blue stripe for port-side exhaust airflow, the power supplies must have blue coloring for the same airflow direction.

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.

Before you begin

Before you can replace a fan module, ensure that the following conditions exist:

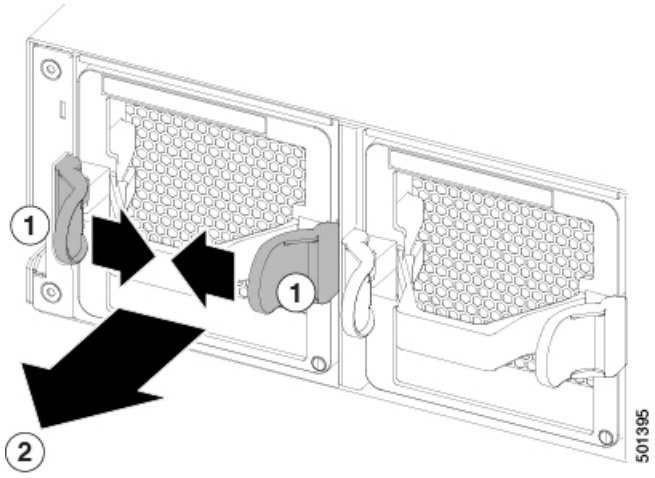
- There are four functioning fan modules in the other fan slots. In order to replace a fan module during operations, there must be three fan modules circulating air in the chassis at all times. The other fan module is redundant and can be replaced.
- Make sure that you use the correct fan for the correct product:
  - For the Cisco UCS 6664 Fabric Interconnect, the correct fan is UCS-FAN-6664.
  - For the Cisco UCS 6652 Fabric Interconnect, the correct fan is UCS-FAN-6652.
- The replacement fan module must have the same airflow direction as the other modules in the chassis.
- 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.

If you must replace the fan module during operations and the above conditions are not met, leave the fan module that you need to replace in the chassis to preserve the designed airflow until you have the required module.

Procedure

Step 1 Remove the fan module that you need to replace as follows:

a) Press the two colored sides of the fan module handle towards each other and pull the handle to slide the module out of the chassis.



1	Press inward on both colored slides of the handle.	2	While holding the sides inward, pull on the handle to remove the module from the chassis.

Step 2 Follow these steps to replace the missing fan module within two minutes to avoid a shutdown.

a) Remove the replacement fan module from its packing materials and place it on an antistatic surface.

Hold the module by its handle and do not touch the electrical connectors on its backside. Also, to protect the electrical connectors, avoid letting them come in contact with anything other than the electrical connectors inside the chassis.

b) Verify that you have the correct fan module for the chassis. The correct fan module has one of the following part numbers:

- UCS-FAN-6664 (port-side exhaust airflow direction and a blue stripe) for a Cisco UCS 6664 Fabric Interconnect
- UCS-FAN-6652 ((port-side exhaust airflow direction and a blue stripe) for a Cisco UCS 6652 Fabric Interconnect.

Note
Be sure that the airflow direction of the new fan module matches the airflow direction of the other fan and AC power supply modules already installed in the chassis. Port-side exhaust airflow is indicated with blue coloring.

c) Position the fan module in front of the open fan slot (be sure that the backside of the module with the electrical connectors is positioned to enter the slot first) and slide the module all the way into the chassis until its front side comes in contact with the chassis. For the last 0.2 inches (0.5 cm), carefully mount the module onto the chassis connectors by pushing more firmly, but do not force the module if it does not move further (excessive force can damage the connectors).

Note

If you are not able to push the module all the way into the slot, carefully slide the module out of the slot and check its electrical connectors for damage. If damaged, contact Cisco Technical Assistance for help. If undamaged, repeat this step to reinstall the module.

d) Verify that the STS LED turns on and becomes green.

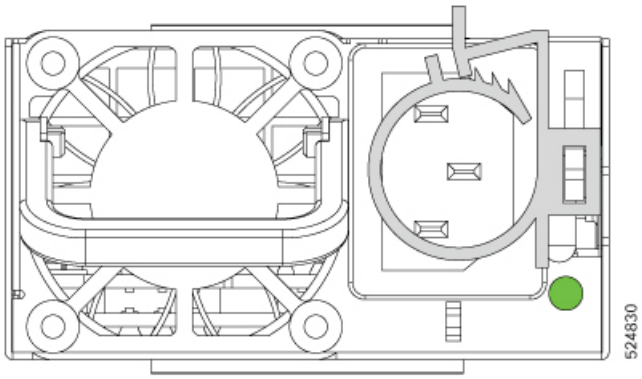
If the STS LED does not turn on, slide the module out of the chassis, and visually check the electrical connectors on the back side of the chassis for damage. If damaged, contact Cisco Technical Assistance for help. If undamaged, repeat the previous step to reinstall the module.

Replacing a Power Supply Module

Both the Cisco UCS 6664 Fabric Interconnect and Cisco UCS 6652 Fabric Interconnect feature two power supply units (PSUs). Power supplies are stacked vertically on the rear of the fabric interconnect. The top PSU is numbered PSU1 and the bottom PSU is numbered PSU2.

Both models of fabric interconnect use the same AC PSUs even though the PIDs differ depending on which chassis has the PSU, either UCS-FAN-6664 for the Cisco UCS 6664 Fabric Interconnect (2U chassis), or the UCS-FAN-6652 for the Cisco UCS 6652 Fabric Interconnect (1U chassis).

Each fabric interconnect requires two power supplies (PSUs) for redundancy, but the fabric interconnect can operate at full power on one PSU for a short time. 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.

Removing an AC Power Supply

The fabric interconnect has two power supplies installed in the rear of the chassis. The power supplies are redundant, so the fabric interconnect can operate with only one PSU installed. However, it is a best practice to operate the fabric interconnect with both PSUs installed. If you are removing or swapping out a PSU, do so as quickly to maximize the PSU redundancy.

To remove an AC power supply, disconnect the power cable and remove the module from the chassis.

Before you begin

- Ensure that the chassis is grounded. For grounding instructions, see Grounding the Chassis, on page 40.
- To replace a power supply during operations, there must be a functioning power supply providing power to the switch while you replace the other power supply. If there is only one power supply installed in the switch and you need to replace it, install the new power supply in the open slot and power it up before removing the original power supply.
- Power supplies have a latch and a handle. You must use both to successfully remove a PSU from the chassis.

Procedure

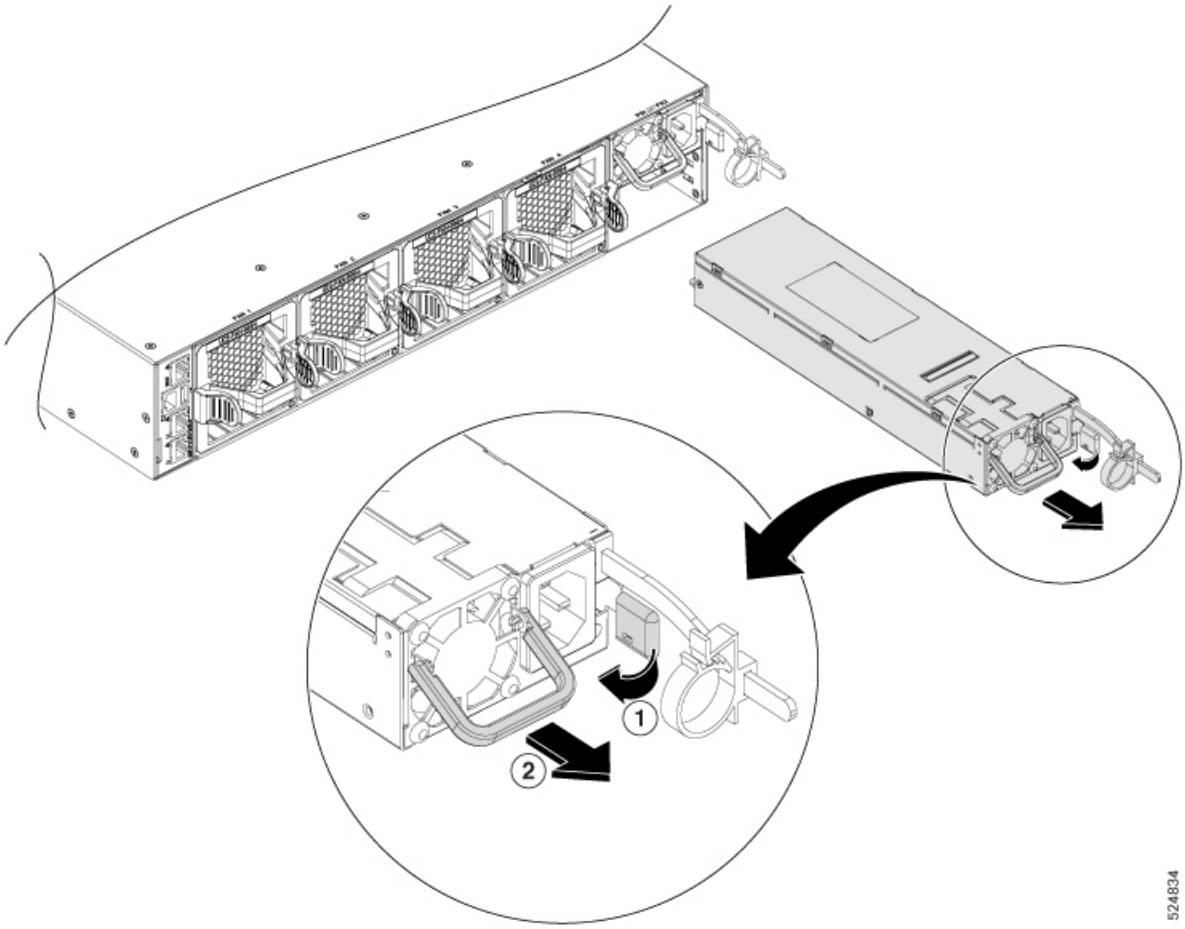
Step 1 Disconnect the power cord from the power receptacle on the power supply to be removed. Verify that the LED turns off.

Note
The LED might be on and amber colored. This indicates that the input power has been disconnected.

Step 2 Using your fingers, push the latch inward to disengage the latch and allow the PSU to be removed from the chassis.

Step 3 Using the same hand, while the release latch is disengaged, pull the handle straight towards you to slide the PSU most of the way out of the chassis.

Step 4 Place your other hand underneath the PSU to support its weight, and slide the PSU completely out of the chassis.



Step 5 Place the power supply on an ESD-safe workspace or in its original packing material. s

What to do next

When you are ready, install the power supply, go to Installing an AC Power Supply, on page 66.

Installing an AC Power Supply

You can replace one power supply while the other one provides power to the fabric interconnect.

Before you begin

- The power supply that you are installing must be capable of using the same airflow direction as the fan trays installed in the same fabric interconnect. It must use the same type of power source as the other power supply installed in the same fabric interconnect.
- 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. Otherwise, only one power source is required.

- There must be an earth-ground connection to the chassis that you are installing the replacement module. Typically, the chassis is grounded by its metal-to-metal connection with a grounded rack. If you need to ground the chassis, see Grounding the Chassis, on page 40.

Procedure

Step 1 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. Align the back end of the power supply (the end with the electrical connections) to the open power supply slot. Carefully slide 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.

Step 2 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 into place.

Step 3 Attach the power cable to the electrical inlet on the front of the power supply.

Step 4 Verify 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, install the optional jumper cable to connect the fabric interconnect to your outlet receptacle.

Step 5 Verify that the power supply is operational by making sure that the power supply LED is green.

Installing and Removing Small-Form Pluggable Modules

Use the following task to install or remove small form pluggable (SFP or SFP+) modules.

Before you begin

See the Cisco UCS 6600 Series Fabric Interconnect datasheet on cisco.com for a list of supported SFP and SFP+ modules. Use only supported SFP/SFP+ modules on the platform.

Warning **Statement 1008—Class 1 Laser Product**

This product is a Class 1 laser product.

Note We recommend that you wait 30 seconds between removal and insertion of an SFP on an interface module. This time is recommended to allow the transceiver software to initialize and synchronize with the standby RSP. Changing an SFP more quickly could result in transceiver initialization issues that disable the SFP.

- Do not remove the dust plugs from the SFP and SFP+ modules or the rubber caps from the fiber-optic cable until you are ready to connect the cable. The plugs and caps protect the module ports and cables from contamination and ambient light.
- Removing and installing an SFP and SFP+ module can shorten its useful life. Do not remove and insert any SFP/SFP+ module more often than is necessary.
- To prevent ESD damage, follow your normal board and component handling procedures when connecting cables to the fabric interconnect and other devices.
- When you insert several SFP and SFP+ modules in multiple ports, wait for 5 seconds between inserting each SFP/SFP+. This will prevent the ports from going into error disabled mode. Similarly, when you remove an SFP and SFP+ from a port, wait for 5 seconds before reinserting it.

Procedure

Step 1 Attach an ESD-preventive wrist strap to your wrist and to an earth ground surface.

Step 2 Find the send (TX) and receive (RX) markings that identify the top of the SFP/SFP+ module.

On some SFP/SFP+ modules, the send and receive (TX and RX) markings might be shown by arrows that show the direction of the connection.

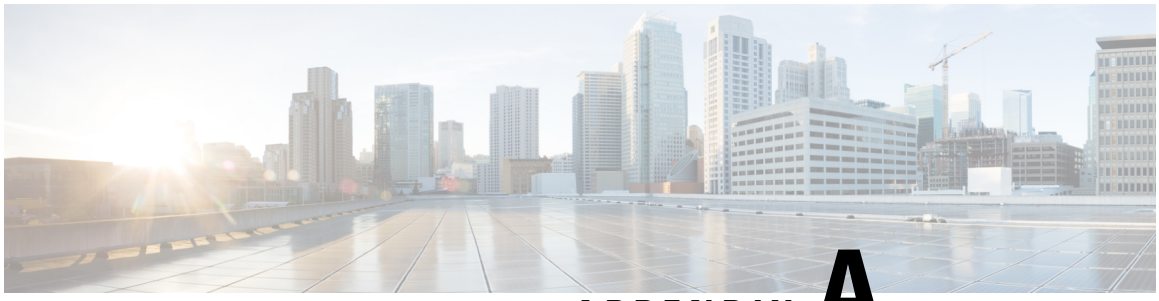
Step 3 If the SFP/SFP+ module has a bale-clasp latch, move it to the open, unlocked position.

Step 4 Align the module in front of the slot opening, and push until you feel the connector snap into place.

Step 5 If the module has a bale-clasp latch, close it to lock the SFP/SFP+ module in place.

Step 6 Remove the SFP and SFP+ dust plugs and save.

Step 7 Connect the SFP and SFP+ cables.



APPENDIX A

Specifications

This appendix contains the following topics:

- Rack Specifications, on page 69
- System Specifications, on page 71
- Power Specifications, on page 72
- Power Cable Specifications, on page 72
- Regulatory Standards Compliance Specifications, on page 75

Rack Specifications

Observe the following rack specifications for the Cisco UCS 6600 Series Fabric Interconnect.

Overview of Racks

Install the fabric interconnect in these types of cabinets and racks, assuming an external ambient air temperature range of 0 to 104°F (0 to 40°C):

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)
- Standard open racks

Note

- If you are using an enclosed cabinet, we recommend one of the thermally validated types, either standard perforated or solid-walled with a fan tray.
- We do not recommend using racks that have obstructions (such as power strips). The obstructions could impair access to field-replaceable units (FRUs).

General Requirements for Cabinets and Racks

The cabinet or rack must also meet the following requirements:

- Standard 19-inch (48.3 cm) (two- or 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). For more information, see Requirements Specific to Perforated Cabinets, on page 70.
- The minimum vertical rack space requirement for the fabric interconnect is 1.75 inches (4.4 cm) per chassis.
- The width between the rack-mounting rails must be at least 17.75 inches (45.0 cm) if the rear of the device is not attached to the rack. For four-post EIA racks, this measurement is the distance between the two front rails.

Four-post EIA cabinets (perforated or solid-walled) must meet the following requirements:

- 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 inches (7.6 cm).
- The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.0 to 30.0 inches (58.4 to 76.2 cm) to allow for rear-bracket installation.

Requirements Specific to Standard Open Racks

If you are mounting the chassis in an open rack (no side panels or doors), ensure that the rack meets these requirements:

- The minimum vertical rack space per chassis must be equal to the rack unit (RU) of the chassis. One rack unit is equal to 1.75 inches (4.4 cm).
- The distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

Requirements Specific to Perforated Cabinets

A perforated cabinet has perforations in its front and rear doors and side walls. Perforated cabinets must meet these requirements:

- The front and rear doors must have at least a 60 percent open area perforation pattern, with at least 15 square inches (96.8 square cm) 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.

Your equipment rack must conform to these requirements.

Cable Management Guidelines

To help with cable management, allow additional space in the rack above and below the chassis to make it easier to route all of the fiber optic or copper cables through the rack.

System Specifications

Observe the following system specifications when installing and operating the Cisco UCS 6600 Series Fabric Interconnect.

Environmental Specifications

Environment		Specification
Temperature	Ambient operating temperature	32 to 104°F (0 to 40°C)
	Ambient nonoperating	–40 to 158°F (–40 to 70°C)
Humidity	Ambient operating humidity	8 to 80%
	Ambient nonoperating	5 to 95%
Altitude	Ambient operating altitude	0 to 10,000 feet (0 to 3,048 meters)
	Ambient nonoperating	-1000 to 30,000 feet (-304 to 15,150 meters)

Chassis Dimensions

Fabric Interconnect	Width	Depth	Height
Cisco UCS 6664 Fabric Interconnect	17.41 inches (44.2 cm)	22.28 inches (56.6 cm)	3.39 inches (8.6 cm) (2 RU)
Cisco UCS 6652 Fabric Interconnect	17.3 inches (43.94 cm)	19.69 inches (50.01 cm)	1.72 inches (4.37 cm)

Fabric Interconnect and Module Weights and Quantities

Component	Weight per Unit	Quantity
Cisco UCS 6664 Fabric Interconnect (UCS-6664-FI), full configuration of two PSUs and four fans	44 lb (20 kg)	1
Fan Module – 2 Port-side exhaust (blue) (UCS-FAN-6664)	— 1.3 lb (0.59 kg)	4
Power Supply module – 1400-W AC port-side exhaust (blue) (UCS-PSU-6600-AC)	— 2.64 lb (1.2 kg)	2 (1 for operation and 1 for redundancy)
Cisco UCS 6652 Fabric Interconnect (UCS-FI-6652), full configuration of two PSUs and four fans	25 lb (11.34 kg)	1

Component	Weight per Unit	Quantity
Fan Module – 2 Port-side exhaust (blue) (UCS-FAN-6652)	— 1.3 lb (0.59 kg)	4
Power Supply module – 1400-W AC port-side exhaust (blue) (UCS-PSU-6600-AC)	— 2.64 lb (1.2 kg)	2 (1 for operation and 1 for redundancy)

Power Specifications

Power specifications include the specifications for each type of power supply module.

1400-W AC Power Supply Specifications

These specifications apply to the UCS-PSU-6600-AC power supplies.

Property	Specification
Power	1400 W
Input Voltage Range	90 VAC to 140 VAC 180 VAC to 264 VAC
Output Power	1,000W/36W 1,450W/36W
Output 1	Main: 12V/84A Main: 12V/121A
Output 2	Standby: 12V/3A
Redundancy Modes	Combined, *n*+1, and *n*+*n*
RoHS Compliance	Yes
Hot Swappable	Yes

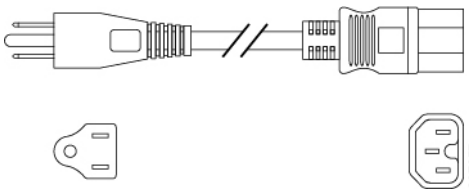
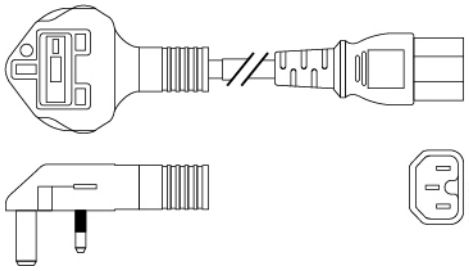
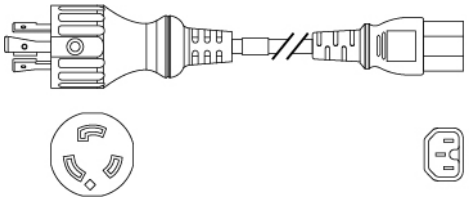
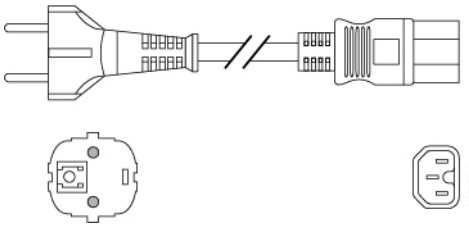
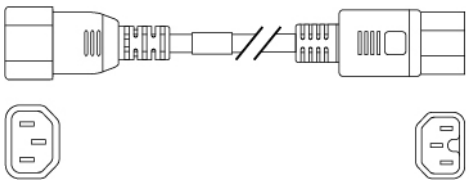
Power Cable Specifications

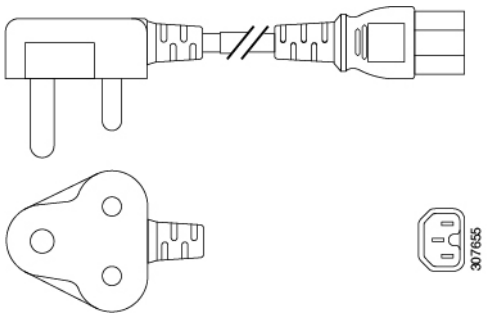
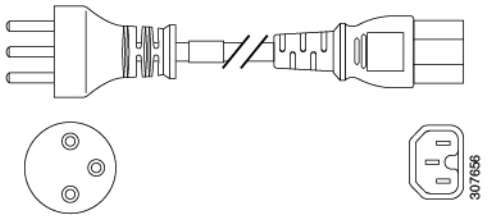
These sections show the power cables that you can order and use with this fabric interconnect.

Power Cable Specifications for AC Power Supplies

Power Type	Power Cord Part Number	Cord Set Description
	CAB-C13-C14-2M	Power Cord Jumper, C13-C14 Connectors, 6.6 feet (2.0 m)
	CAB-C13-CBN	Cabinet jumper power cord, 250 VAC, 10 A, C14-C13 connectors, 2.3 feet (0.7 m)
Argentina	CAB-250V-10A-AR	250 V, 10 A, 8.2 feet (2.5 m)
Australia	CAB-9K10A-AU	250 VAC, 10 A, 3112 plug, 8.2 feet (2.5 m)
Brazil	CAB-250V-10A-BR	250 V, 10 A, 6.9 feet (2.1 m)
European Union	CAB-9K10A-EU	250 VAC, 10 A, CEE 7/7 plug, 8.2 feet (2.5 m)
India	CAB-IND-10A	10 A, 8.2 feet (2.5 m)
India	CAB-C13-C14-2M-IN	Power Cord Jumper, C13-C14 Connectors, 6.6 feet (2.0 m)
India	CAB-C13-C14-3M-IN	Power Cord Jumper, C13-C14 Connectors, 9.8 feet (3.0 m)
Israel	CAB-250V-10A-IS	250 V, 10 A, 8.2 feet (2.5 m)
Italy	CAB-9K10A-IT	250 VAC, 10 A, CEI 23-16/VII plug, 8.2 feet (2.5 m)
Japan	CAB-C13-C14-2M-JP	Power Cord Jumper, C13-C14 Connectors, 6.6 feet (2.0 m)
North America	CAB-AC-L620-C13	NEMA L6-20-C13, 6.6 feet (2.0 m)
North America	CAB-N5K6A-NA	200/240V, 6A, 8.2 feet (2.5 m)
Peoples Republic of China	CAB-250V-10A-CN	250 V, 10 A, 8.2 feet (2.5 m)
South Africa	CAB-250V-10A-ID	250 V, 10 A, 8.2 feet (2.5 m)
Switzerland	CAB-9K10A-SW	250 VAC, 10 A, MP232 plug, 8.2 feet (2.5 m)
United Kingdom	CAB-9K10A-UK	250 VAC, 10 A, BS1363 plug (13 A fuse), 8.2 (2.5 m)
All except Argentina, Brazil, and Japan	NO-POWER-CORD	No power cord included with fabric interconnect

Power Cables for UCS-PSU-6600-AC Power Supplies

Cable	Description	Illustration
CAB-TA-NA	North America AC Type A Power Cable	
CAB-TA-UK	United Kingdom AC Type A Power Cable	
CAB-TA-250V-JP	Japan 250V AC Type A Power Cable	
CAB-TA-EU	Europe AC Type A Power Cable	
CAB-C15-CBN	Cabinet Jumper Power Cord, 250 VAC 13A, C14-C15 Connectors	
CAB-ACBZ-12A	AC Power Cord (Brazil) 12A/125V BR-3-20 plug up to 12A	

Cable	Description	Illustration
CAB-TA-IN	India AC Type A Power Cable	
CAB-TA-IS	Israel AC Type A Power Cable	

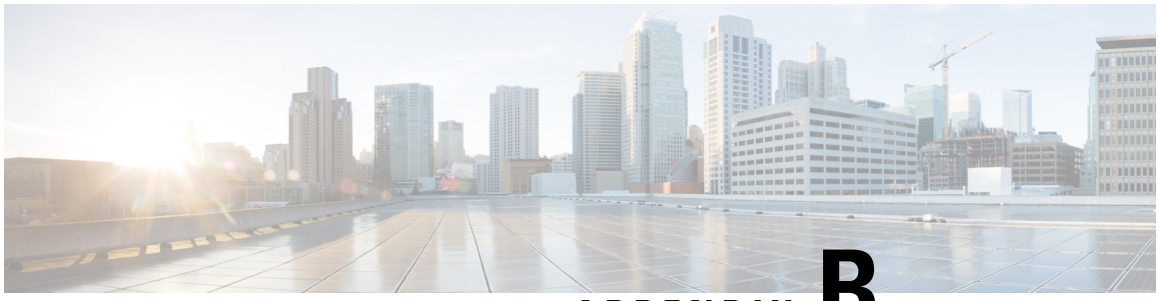
Regulatory Standards Compliance Specifications

This table lists the regulatory standards compliance for the fabric interconnect.

Table 1: Regulatory Standards Compliance: Safety and EMC

Specification	Description
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC.
Safety	• CAN/CSA-C22.2 No. 60950-1 Second Edition • CAN/CSA-C22.2 No. 62368-1-19 Third Edition • ANZI/UL 60950-1 Second edition • IEC 62368-1 • EN 62368-1 • AS/NZS 62368-1 • GB4943 • UL 62368-1

Specification	Description
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR22 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A **Note** The Cisco UCS 6600 Series Fabric Interconnect passes EMC Radiated Emissions standards in all configurations except when you use more than 40 pluggable optics of Cisco part number 10-3142-01 or 10-3142-02.
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN 61000-4 series
RoHS	The product is RoH-6 compliant with exceptions for leaded-ball grid-array (BGA) balls and lead press-fit connectors.



APPENDIX B

Additional Hardware

This appendix contains the following topics:

- Additional Kits, on page 77
- Additional Components and Cables, on page 78

Additional Kits

The following additional kit is available for the fabric interconnect.

Rack Mount Kit UCS-ACC-6664

The following table lists and illustrates the contents for the 2-RU rack-mount kit (UCS-ACC-6664).

Caution The rack mount kit described in this topic contains the screws to assemble the pieces of the kit. However, you must provide twelve 10-32 or 12-24 screws, based on the type of rack you have, to secure the slider rails and fabric interconnect to the rack. Failure to provide and install these screws can cause the fabric interconnect to slide into or out of the rack.

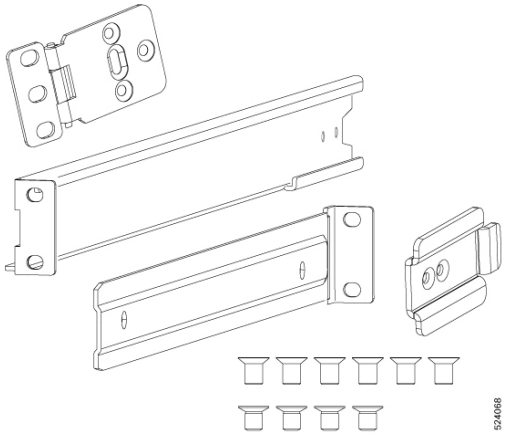
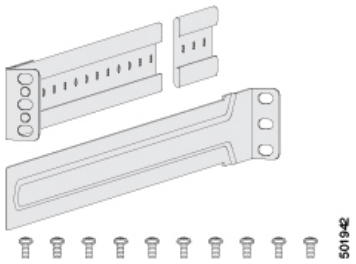
Illustration	Description	Quantity
	Rack-mount kit • Rack-mount brackets (2) • Rack-mount front-mount brackets (2) • Rack-mount slider rails (2) • Rack-mount retainer clips (2) • Phillips pan-head screws (12), not included, customer provided • Flat head screws M4 (6) • Flat head screws M3 (4)	1

Illustration	Description	Quantity
Not applicable	EAC Compliance document	1
Not applicable	Hazardous substances list for customers in China	1

Rack Mount Kit UCS-ACC-6652

The following table lists and illustrates the contents for the 1-RU rack-mount kit (UCS-ACC-6652=).

Illustration	Description	Quantity
	Rack-mount kit • Front brackets (2) • Rear brackets (2) • Slider rails (2) • M4 Phillips pan-head screws (10)	1
	Ground lug kit • Two-hole lug (1) • M4 x 8-mm Phillips pan-head screws (2)	1
Not applicable	EAC Compliance document	1
Not applicable	Hazardous substances list for customers in China	1

Additional Components and Cables

The fabric interconnect supports the following additional hardware components and cables.

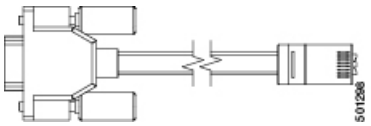
- Cables and Components for the Cisco UCS 6664 Fabric Interconnect, on page 78
- Cables and Components for the Cisco UCS 6652 Fabric Interconnect, on page 83

Cables and Components for the Cisco UCS 6664 Fabric Interconnect

This topic contains the additional cables and components that are supported on the Cisco UCS 6664 Fabric Interconnects. See the appropriate section.

Console Cable

The following table lists and illustrates the console cable (CAB-CONSOLE-RJ45) that can be ordered.

Illustration	Description	Quantity
	Console cable with DB-9F and RJ-45F connectors	1

100 GbE Components

The following table shows the PIDs and descriptions for relevant 100GbE components and cables.

PID	Description
QSFP-100G-SR4-S	100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF
QSFP-100G-LR4-S	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF
QSFP-100G-PSM4-S	100GBASE PSM4 QSFP Transceiver, 500m over SMF
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10-60C
QSFP-100G-SL4	100GBASE SL4 for up to 30M over OM4 MMF
QSFP-100G-ER4L-S	100GBASE QSFP Transceiver, 40KM reach over SMF, Duplex LC
QSFP-40/100-SRBD	100G and 40GBASE SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF
QSFP-100G-DR-S	100G QSFP28 Transceiver 100GBASE-DR, 500m SMF, duplex, LC
QSFP-100G-FR-S	100G QSFP28 Transceiver 100G-FR, 2km SMF, duplex, LC
QSFP-100G-LR-S	100G QSFP28 100G-LR, 10km SMF, duplex, LC Connector
QSFP-100G-SR1.2	100G SR1.2 BiDi QSFP Transceiver, LC, 100m OM4 MMF
QSFP-100G-CU1M	100GBASE-CR4 Passive Copper Cable, 1m
QSFP-100G-CU2M	100GBASE-CR4 Passive Copper Cable, 2m
QSFP-100G-CU3M	100GBASE-CR4 Passive Copper Cable, 3m
QSFP-100G-CU5M	100GBASE-CR4 Passive Copper Cable, 5m
QSFP-100G-AOC1M	100GBASE QSFP Active Optical Cable, 1m
QSFP-100G-AOC2M	100GBASE QSFP Active Optical Cable, 2m
QSFP-100G-AOC3M	100GBASE QSFP Active Optical Cable, 3m

PID	Description
QSFP-100G-AOC5M	100GBASE QSFP Active Optical Cable, 5m
QSFP-100G-AOC7M	100GBASE QSFP Active Optical Cable, 7m
QSFP-100G-AOC10M	100GBASE QSFP Active Optical Cable, 10m
QSFP-100G-AOC15M	100GBASE QSFP Active Optical Cable, 15m
QSFP-100G-AOC20M	100GBASE QSFP Active Optical Cable, 20m
QSFP-100G-AOC25M	100GBASE QSFP Active Optical Cable, 25m
QSFP-100G-AOC30M	100GBASE QSFP Active Optical Cable,30m

50 GbE Components and Cables on Unified Ports

The following table shows the PIDs and descriptions for relevant 50 GbE components and cables on unified ports.

Product ID (PID)	Description
SFP-50G-SL	25/50GBASE-SL Transceiver
SFP-50G-SR-S	25/50GBASE-SR SFP56 Transceiver

40 GbE Components and Cables

The following table shows the PIDs and descriptions for relevant 40 GbE components and cables.

PID	Description
QSFP-40G-SR4	40GBASE-SR4 QSFP Transceiver Module with MPO Connector
QSFP-40G-SR4-S	40GBASE-SR4 QSFP Transceiver Module, MPO Conn, Enterprise-Class
QSFP-40G-LR4	QSFP 40GBASE-LR4 OTN Transceiver, LC, 10KM
QSFP-40G-LR4-S	QSFP 40GBASE-LR4 Transceiver Module, LC, 10km, Enterprise-Class
QSFP-40G-SR-BD	QSFP40G BiDi Short-reach Transceiver
QSFP-H40G-CU1M	40GBASE-CR4 Passive Copper Cable, 1m
QSFP-H40G-CU3M	40GBASE-CR4 Passive Copper Cable, 3m
QSFP-H40G-CU5M	40GBASE-CR4 Passive Copper Cable, 5m
QSFP-H40G-ACU7M	40GBASE-CR4 Active Copper Cable, 7m
QSFP-H40G-ACU10M	40GBASE-CR4 Active Copper Cable, 10m

PID	Description
QSFP-H40G-AOC1M	40GBASE Active Optical Cable, 1m
QSFP-H40G-AOC2M	40GBASE Active Optical Cable, 2m
QSFP-H40G-AOC3M	40GBASE Active Optical Cable, 3m
QSFP-H40G-AOC5M	40GBASE Active Optical Cable, 5m
QSFP-H40G-AOC7M	40GBASE Active Optical Cable, 7m
QSFP-H40G-AOC10M	40GBASE Active Optical Cable, 10m
QSFP-H40G-AOC15M	40GBASE Active Optical Cable, 15m
QSFP-H40G-AOC20M	40GBASE Active Optical Cable, 20m
QSFP-H40G-AOC25M	40GBASE Active Optical Cable, 25m
QSFP-H40G-AOC30M	40GBASE Active Optical Cable, 30m
CVR-QSFP-SFP10G	QSFP to SFP10G adapter

25 GbE Components and Cables on Unified Ports

The following table shows the PIDs and descriptions for relevant 25 GbE components and cables on unified ports.

PID	Description
SFP-25G-SR-S	25GBASE-SR SFP Module
SFP-10/25G-SR-S	10/25GBASE-LR SFP28 Module
SFP-10/25G-CSR-S	Dual Rate 10/25GBASE-CSR SFP Module
SFP-25G-SL	25GBASE-SR SFP SL Module
SFP-H25G-CU1M	25GBASE-CU SFP28 Cable 1 Meter
SFP-H25G-CU2M	25GBASE-CU SFP28 Cable 2 Meter
SFP-H25G-CU3M	25GBASE-CU SFP28 Cable 3 Meter
SFP-H25G-CU4M	25GBASE-CU SFP28 Cable 4 Meter
SFP-H25G-CU5M	25GBASE-CU SFP28 Cable 5 Meter
SFP-25G-AOC1M	25GBASE Active Optical SFP28 Cable, 1M
SFP-25G-AOC2M	25GBASE Active Optical SFP28 Cable, 2M
SFP-25G-AOC3M	25GBASE Active Optical SFP28 Cable, 3M
SFP-25G-AOC4M	25GBASE Active Optical SFP28 Cable, 4M

PID	Description
SFP-25G-AOC5M	25GBASE Active Optical SFP28 Cable, 5M
SFP-25G-AOC7M	25GBASE Active Optical SFP28 Cable, 7M
SFP-25G-AOC10M	25GBASE Active Optical SFP28 Cable, 10M

25 GbE Components and Cables on 100Gbps Ports

The following table shows the PIDs and descriptions for relevant 25 GbE components and cables on 100Gbps-capable ports.

PID	Description
SFP-25G-SR-S	25GBASE-SR SFP Module
SFP-10/25G-LR-S	10/25GBASE-LR SFP28 Module
SFP-10/25G-CSR-S	Dual Rate 10/25GBASE-CSR SFP Module
SFP-10/25G-LR-I	10/25GBASE-LR-I SFP28 iTemp Module
SFP-25G-SL	25GbE on 100G port (with QSA28)

10 GbE Components and Cables on Unified Ports

The following table shows the PIDs and descriptions for relevant 10 GbE components and cables.

PID	Description
SFP-10G-SR	10GBASE-SR SFP Module
SFP-10G-SR-S	10GBASE-SR SFP Module, Enterprise-Class
SFP-10G-LR	10GBASE-LR SFP Module
SFP-10G-LR-S	10GBASE-LR SFP Module, Enterprise-Class
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU2M	10GBASE-CU SFP+ Cable 2 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter
SFP-H10GB-ACU7M	Active Twinax cable assembly, 7 Meter
SFP-H10GB-ACU10M	Active Twinax cable assembly, 10 Meter
SFP-10G-AOC1M	10GBASE Active Optical SFP+ Cable, 1M
SFP-10G-AOC2M	10GBASE Active Optical SFP+ Cable, 2M

PID	Description
SFP-10G-AOC3M	10GBASE Active Optical SFP+ Cable, 3M
SFP-10G-AOC5M	10GBASE Active Optical SFP+ Cable, 5M
SFP-10G-AOC7M	10GBASE Active Optical SFP+ Cable, 7M
SFP-10G-AOC10M	10GBASE Active Optical SFP+ Cable, 10M

10 GbE Components and Cables on 100Gbps Ports (QSA)

The following table shows the PIDs and descriptions for relevant 10GbE GSA components and cables on 100 Gbps ports.

PID	Description
SFP-10G-SR	10GBASE-SR SFP Module
SFP-10G-SR-S	10GBASE-SR SFP Module, Enterprise-Class
SFP-10G-LR	10GBASE-LR SFP Module
SFP-10G-LR-S	10GBASE-LR SFP Module, Enterprise-Class

Fibre Channel SFP Transceivers

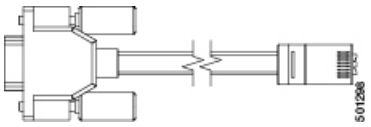
The following table shows the PIDs and descriptions for relevant FC transceivers.

PID	Description
DS-SFP-FC16G-SW	16 Gbps Fibre Channel SW SFP+, LC
DS-SFP-FC32G-SW	32 Gbps Fibre Channel SW SFP+, LC
DS-SFP-FC64G-SW	64 Gbps Fibre Channel SW SFP+, LC
DS-SFP-FC16G-LW	16 Gbps Fibre Channel LW SFP+, LC
DS-SFP-FC32G-LW	32 Gbps Fibre Channel LW SFP+, LC
DS-SFP-FC64G-LW	64 Gbps Fibre Channel LW SFP+, Optic

Cables and Components for the Cisco UCS 6652 Fabric Interconnect

Console Cable

The following table lists and illustrates the console cable (CAB-CONSOLE-RJ45) that can be ordered.

Illustration	Description	Quantity
	Console cable with DB-9F and RJ-45F connectors	1

400GbE Components

The following table shows the PIDs and descriptions for the relevant 400 Gigabit Ethernet media (QSFP-DD, Uplink Only).

Product ID (PID)	Description
QDD-400G-FR4-S	400G QSFP-DD Transceiver,400G-FR4,Duplex LC,2km Duplex SMF
QDD-400G-DR4-S	400G QSFP-DD Transceiver, 400GBASE-DR4, MPO-12,500m parallel
QDD-4x100G-FR-S	QSFP-DD, 4x 100G-FR breakout, MPO-12 SMF, 2km
QDD-4x100G-LR-S	QSFP-DD, 4x 100G-LR breakout, MPO-12 SMF, 10km
QDD-400G-LR4-S	400G QSFP-DD Transceiver,400GBASE-LR4,SMF Duplex LC,10km
QDD-400-CU1M	400G Passive Cable, 1m
QDD-400-CU2M	400G Passive Cable, 2m
QDD-400-CU3M	400G Passive Cable, 3m
QDD-400-AOC1M	400G QSFP-DD Active Optical Cable, 1M
QDD-400-AOC2M	400G QSFP-DD Active Optical Cable, 2M
QDD-400-AOC3M	400G QSFP-DD Active Optical Cable, 3M

100 GbE Components

The following table shows the PIDs and descriptions for the relevant 100 Gigabit Ethernet media (QSFP-DD, Uplink Only).

Product ID (PID)	Description
QSFP-100G-SR4-S	100GBASE SR4 QSFP Transceiver, MPO, 100m over OM4 MMF
QSFP-100G-LR4-S	100GBASE LR4 QSFP Transceiver, LC, 10km over SMF
QSFP-100G-CWDM4-S	100GBASE CWDM4 QSFP Transceiver, LC, 2km over SMF
QSFP-100G-PSM4-S	100GBASE PSM4 QSFP Transceiver, MPO, 500m over SMF
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10-60C
QSFP-100G-SL4	100GBASE SL4 for up to 30M over OM4 MMF
QSFP-100G-ER4L-S	100GBASE QSFP Transceiver, 40KM reach over SMF, Duplex LC
QSFP-40/100-SRBD	100G and 40GBASE SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF
QSFP-100G-DR-S	100G QSFP28 Transceiver 100GBASE-DR, 500m SMF, duplex, LC

Product ID (PID)	Description
QSFP-100G-FR-S	100G QSFP28 Transceiver 100G-FR, 2km SMF, duplex, LC
QSFP-100G-LR-S	100G QSFP28 100G-LR, 10km SMF, duplex, LC Connector
QSFP-100G-SR1.2	100G SR1.2 BiDi QSFP Transceiver, LC, 100m OM4 MMF
QSFP-100G-CU1M	100GBASE-CR4 Passive Copper Cable, 1m
QSFP-100G-CU2M	100GBASE-CR4 Passive Copper Cable, 2m
QSFP-100G-CU3M	100GBASE-CR4 Passive Copper Cable, 3m
QSFP-100G-CU5M	100GBASE-CR4 Passive Copper Cable, 5m
QSFP-4SFP25G-CU1M	100GBase QSFP to 4xSFP25G Passive Copper Splitter Cable, 1m
QSFP-4SFP25G-CU2M	100GBase QSFP to 4xSFP25G Passive Copper Splitter Cable, 2m
QSFP-4SFP25G-CU3M	100GBase QSFP to 4xSFP25G Passive Copper Splitter Cable, 3m
QSFP-4SFP25G-CU5M	100GBase QSFP to 4xSFP25G Passive Copper Splitter Cable, 5m
QSFP-100G-AOC1M	100GBASE QSFP Active Optical Cable, 1m
QSFP-100G-AOC2M	100GBASE QSFP Active Optical Cable, 2m
QSFP-100G-AOC3M	100GBASE QSFP Active Optical Cable, 3m
QSFP-100G-AOC5M	100GBASE QSFP Active Optical Cable, 5m
QSFP-100G-AOC7M	100GBASE QSFP Active Optical Cable, 7m
QSFP-100G-AOC10M	100GBASE QSFP Active Optical Cable, 10m
QSFP-100G-AOC15M	100GBASE QSFP Active Optical Cable, 15m
QSFP-100G-AOC20M	100GBASE QSFP Active Optical Cable, 20m
QSFP-100G-AOC25M	100GBASE QSFP Active Optical Cable, 25m
QSFP-100G-AOC30M	100GBASE QSFP Active Optical Cable, 30m

50 GbE Components

The following table shows the PIDs and descriptions for the relevant 50 Gigabit Ethernet media (SFP, including Unified Ports).

Product ID (PID)	Description
SFP-50G-SL	25/50GBASE-SL Transceiver
SFP-50G-CU3M	25/50GBASE-CU SFP56 Cable 3 Meter. LSZH
SFP-50G-CU5M	25/50GBASE-CU SFP56 Cable 5 Meter LSZH
SFP-50G-SR-S	25/50GBASE-SR SFP56 Transceiver

40 GbE Components

The following table shows the PIDs and descriptions for the relevant 40 Gigabit Ethernet media (QSFP-DD, Uplink Only).

Product ID (PID)	Description
QSFP-40G-SR4	40GBASE-SR4 QSFP Transceiver Module with MPO Connector
QSFP-40G-SR4-S	40GBASE-SR4 QSFP Trnscvr Module, MPO Conn, Enterprise-Class
QSFP-40G-CSR4	QSFP 4x10GBASE-SR Transceiver Module, MPO, 300M
QSFP-40G-LR4	QSFP 40GBASE-LR4 OTN Transceiver, LC, 10KM
QSFP-40G-SR-BD	QSFP40G BiDi Short-reach Transceiver
QSFP-H40G-CU1M	40GBASE-CR4 Passive Copper Cable, 1m
QSFP-H40G-CU3M	40GBASE-CR4 Passive Copper Cable, 3m
QSFP-H40G-CU5M	40GBASE-CR4 Passive Copper Cable, 5m
QSFP-H40G-ACU7M	40GBASE-CR4 Active Copper Cable, 7m
QSFP-H40G-ACU10M	40GBASE-CR4 Active Copper Cable, 10m
QSFP-4SFP10G-CU1M	QSFP to 4xSFP10G Passive Copper Splitter Cable, 1m
QSFP-4SFP10G-CU2M	QSFP to 4xSFP10G Passive Copper Splitter Cable, 2m
QSFP-4SFP10G-CU3M	QSFP to 4xSFP10G Passive Copper Splitter Cable, 3m
QSFP-4SFP10G-CU5M	QSFP to 4xSFP10G Passive Copper Splitter Cable, 5m
QSFP-4X10G-LR-S	QSFP 4x10G Transceiver Module, SM MPO, 10KM, Enterprise-Class
QSFP-4X10G-AOC1M	40GBASE Active Optical QSFP to 4SFP breakout Cable, 1m
QSFP-4X10G-AOC2M	40GBASE Active Optical QSFP to 4SFP breakout Cable, 2m
QSFP-4X10G-AOC3M	40GBASE Active Optical QSFP to 4SFP breakout Cable, 3m
QSFP-4X10G-AOC5M	40GBASE Active Optical QSFP to 4SFP breakout Cable, 5m
QSFP-4X10G-AOC7M	40GBASE Active Optical QSFP to 4SFP breakout Cable, 7m
QSFP-H40G-AOC1M	40GBASE Active Optical Cable, 1m
QSFP-H40G-AOC2M	40GBASE Active Optical Cable, 2m
QSFP-H40G-AOC3M	40GBASE Active Optical Cable, 3m
QSFP-H40G-AOC5M	40GBASE Active Optical Cable, 5m
QSFP-H40G-AOC7M	40GBASE Active Optical Cable, 7m
QSFP-H40G-AOC10M	40GBASE Active Optical Cable, 10m
QSFP-H40G-AOC15M	40GBASE Active Optical Cable, 15m

25 GbE Components

The following table shows the PIDs and descriptions for the relevant 25 Gigabit Ethernet media.

Product ID (PID)	Description
SFP-25G-SR-S	25GBASE-SR SFP Module

Product ID (PID)	Description
SFP-10/25G-LR-S	10/25GBASE-LR SFP28 Module
SFP-10/25G-CSR-S	Dual Rate 10/25GBASE-CSR SFP Module
SFP-25G-SL	25GBASE-SR SFP SL Module
SFP-H25G-CU1M	25GBASE-CU SFP28 Cable 1 Meter
SFP-H25G-CU2M	25GBASE-CU SFP28 Cable 2 Meter
SFP-H25G-CU3M	25GBASE-CU SFP28 Cable 3 Meter
SFP-H25G-CU4M	25GBASE-CU SFP28 Cable 4 Meter
SFP-H25G-CU5M	25GBASE-CU SFP28 Cable 5 Meter
SFP-25G-AOC1M	25GBASE Active Optical SFP28 Cable, 1M
SFP-25G-AOC2M	25GBASE Active Optical SFP28 Cable, 2M
SFP-25G-AOC3M	25GBASE Active Optical SFP28 Cable, 3M
SFP-25G-AOC4M	25GBASE Active Optical SFP28 Cable, 4M
SFP-25G-AOC5M	25GBASE Active Optical SFP28 Cable, 5M
SFP-25G-AOC7M	25GBASE Active Optical SFP28 Cable, 7M
SFP-25G-AOC10M	25GBASE Active Optical SFP28 Cable, 10M

10 GbE Components

The following table shows the PIDs and descriptions for the relevant 10 Gigabit Ethernet transceivers.

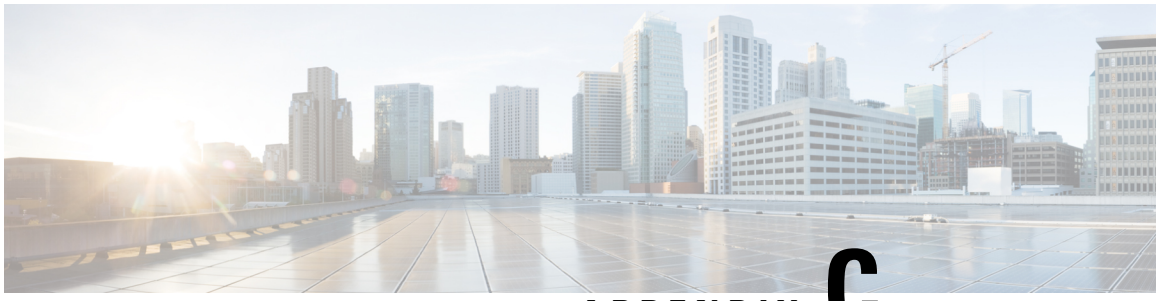
Product ID (PID)	Description
SFP-10G-SR	10GBASE-SR SFP Module
SFP-10G-SR-S	10GBASE-SR SFP Module, Enterprise-Class
SFP-10G-LR	10GBASE-LR SFP Module
SFP-10G-LR-S	10GBASE-LR SFP Module, Enterprise-Class
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU2M	10GBASE-CU SFP+ Cable 2 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU4M	10GBASE-CU SFP+ Cable 4 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter
SFP-H10GB-CU1-5M	10GBASE-CU SFP+ Cable 1.5 Meter
SFP-H10GB-CU2-5M	10GBASE-CU SFP+ Cable 2.5 Meter
SFP-10G-AOC1M	10GBASE Active Optical SFP+ Cable, 1M
SFP-10G-AOC2M	10GBASE Active Optical SFP+ Cable, 2M

Product ID (PID)	Description
SFP-10G-AOC3M	10GBASE Active Optical SFP+ Cable, 3M
SFP-10G-AOC5M	10GBASE Active Optical SFP+ Cable, 5M
SFP-10G-AOC7M	10GBASE Active Optical SFP+ Cable, 7M
SFP-10G-AOC10M	10GBASE Active Optical SFP+ Cable, 10M

FC (Unified Port) Components

The following table shows the PIDs and descriptions for relevant FC or Unified Port media.

Product ID (PID)	Description
DS-SFP-FC16G-SW	16 Gbps Fibre Channel SW SFP+, LC
DS-SFP-FC32G-SW	32 Gbps Fibre Channel SW SFP+, LC
DS-SFP-FC64G-SW	64 Gbps Fibre Channel SW SFP+, LC
DS-SFP-FC16G-LW	16 Gbps Fibre Channel LW SFP+, LC
DS-SFP-FC32G-LW	32 Gbps Fibre Channel LW SFP+, LC
DS-SFP-FC64G-LW	64 Gbps Fibre Channel LW SFP+, Optic



APPENDIX C

Site Preparation and Maintenance Records

This appendix contains the following topics:

- Site Preparation Checklist, on page 89
- Contact and Site Information, on page 90
- Chassis and Module Information, on page 91

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 2: 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			

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

Contact and Site Information

Use the following worksheet to record contact and site information.

Table 3: 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 4: Network-Related Information

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

Site Preparation and Maintenance Records

Table 5: Module Information

Slot	Module Type	Module Serial Number	Notes
1	Fixed		

Table 6: 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						

Site Preparation and Maintenance Records

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						
	33						
	34						
	35						
	36						



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