



Product Overview

This chapter includes the following sections:

- [Interconnect Features, on page 1](#)
- [Cisco UCS 6248 UP Fabric Interconnect Chassis, on page 2](#)
- [Cisco UCS 6296 UP Fabric Interconnect Chassis, on page 4](#)
- [Power Supplies, on page 8](#)
- [Fan Module, on page 11](#)
- [LED Descriptions, on page 12](#)
- [Supported Transceivers, on page 14](#)

Interconnect Features

A Cisco UCS 6200 series fabric interconnect is a top-of-rack fabric interconnect that provides Ethernet and Fibre Channel to all servers in the UCS system. Servers connect to the fabric interconnect, and it connects to the LAN or SAN.

This family of fabric interconnects connect UCS servers to 10 Gigabit Ethernet 1, 2, 4, and 8 Gbps Fibre Channel networks, and provides consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency environment.

The Cisco UCS 6200 series has the following characteristics:

- The UCS 6248 UP fabric interconnect is a one-rack-unit (1 RU), 10-Gigabit Ethernet and FCoE device that offers up to 960-Gbps throughput and up to 48 ports. It has 32 1- or 10-Gbps fixed small form-factor pluggable plus (SFP+) ports and one expansion slot. The Cisco UCS 6248 UP has 32 ports on the base system and can be upgraded with one expansion module providing an additional 16 ports.
- The UCS 6296 UP fabric interconnect is a two-rack-unit (2 RU), 10-Gigabit Ethernet and FCoE device that offers up to 1920-Gbps throughput and up to 96 ports. It has 48 1- or 10-Gbps fixed SFP+ ports and three expansion slots. The Cisco UCS 6248 UP has 48 ports on the base system and can be upgraded with three expansion modules providing an additional 48 ports.
- Universal port functionality allows Ethernet or Fibre Channel over Ethernet (FCoE) physical port types to be selected in software.
- Slots on the back of the switch for an expansion module. You can use the UCS EIGUP module.
- Slots on the front of the chassis for hot swap-capable power supplies.

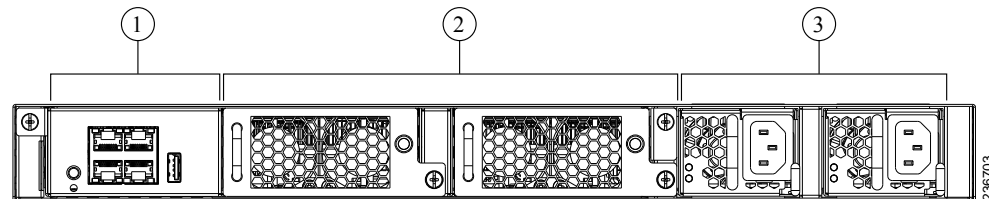
- Slots on the front of the chassis for fan modules.
- One USB port at the front of the switch.

Cisco UCS 6248 UP Fabric Interconnect Chassis

The Cisco UCS 6248 UP chassis is 1 RU, 1.72 inches tall, 17.3 inches wide and 30.0 inches deep. It mounts in a standard 19-inch rack (the Cisco R Series rack is an ideal choice). The chassis has two power supplies and two fan modules on the front of the chassis, and it has network ports on the rear of the chassis and has one USB port (usb1:) at the front.

Thirty-two fixed 10-Gigabit Ethernet ports and an expansion modules slot supporting 16 ports are at the rear of the switch. The airflow is front to back.

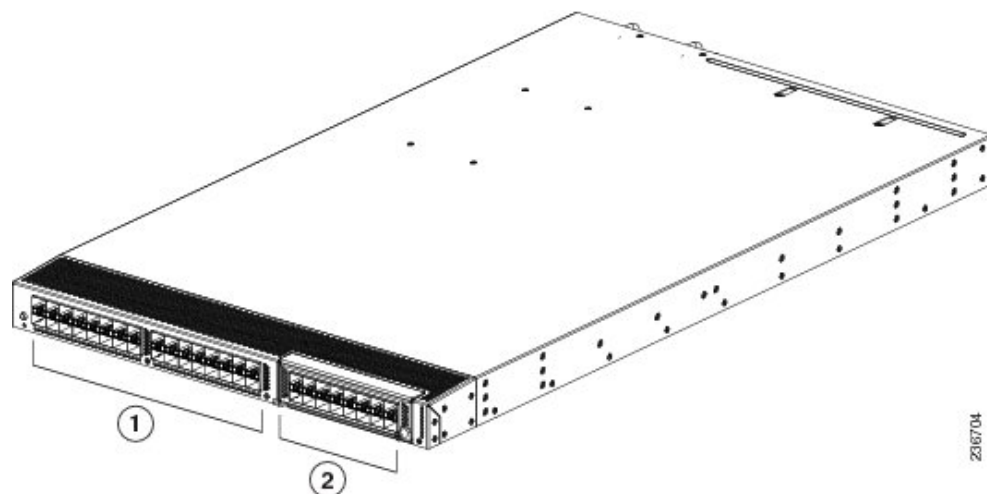
Figure 1: Cisco UCS 6248 UP Front View



1	Management (10/100/1000) port, console port, and USB port	3	Two power supplies (AC shown)
2	Two fan modules		

The rear of the Cisco UCS 6248 UP chassis has 32 fixed 10-Gigabit, Fiber Channel over Ethernet-capable SFP+ Ethernet ports and 1 slot for an optional expansion module.

Figure 2: Cisco UCS 6248 UP Rear View



1	32 fixed 10-Gigabit Ethernet ports	2	16 Expansion module ports
---	------------------------------------	---	---------------------------

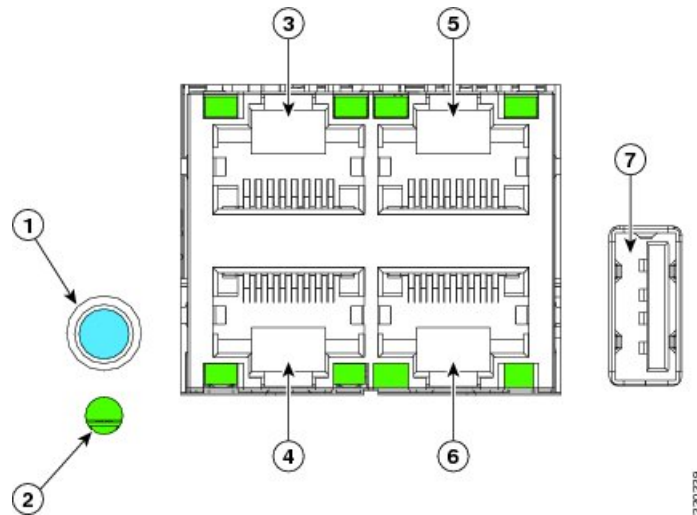
Figure 3: Cisco UCS 6248 UP Switch Rear View Close-up



1	System status LED and beaoning LED/button	3	16 port Expansion module
2	32 fixed 10-Gigabit Ethernet ports		

The front connector ports are in a 2x2 stacked RJ-45 jack.

Figure 4: Connector Ports and LED Closeup



1	Beaoning LED/button	5	Network management port
2	System Status LED	6	Console port
3	UCS cross connect port L1	7	USB port
4	UCS cross connect port L2		

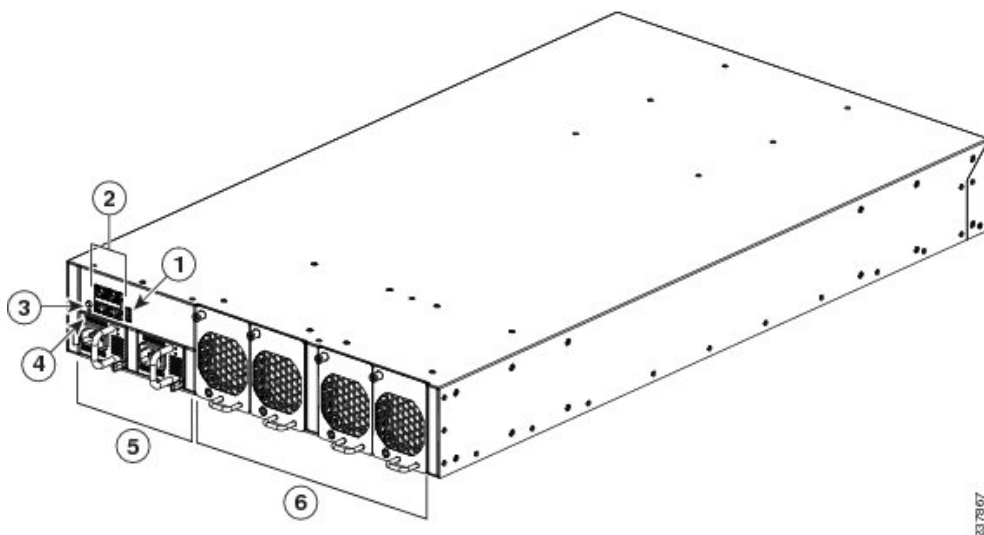
Table 1: Ethernet LED Descriptions

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

Cisco UCS 6296 UP Fabric Interconnect Chassis

The Cisco UCS 6296 UP chassis is 2 RU or 3.47 inches (8.8 cm) tall, 17.3 inches (43.9 cm) wide, and 29.5 inches (74.9 cm) deep. It is designed to be mounted in a standard 19-inch wide rack. The front of the switch has a USB port, four Ethernet and ports (two cross-connect ports, one management port, and one console port), two power supplies, and four fan modules.

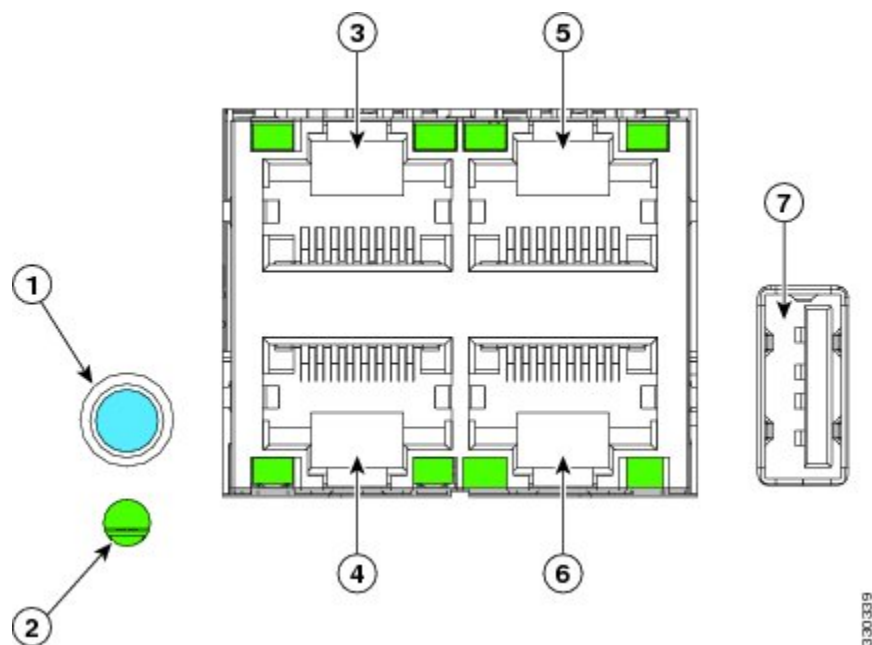
Figure 5: Front View of the Cisco UCS 6296 UP



1	USB port	4	System status LED
2	Management and console ports (two RJ-45 Ethernet connector ports on the left, a RJ-45 network management connector on the upper right, and a console connector on the lower right)	5	Two power supplies
3	Identifier LED	6	Four fan modules

The management and console ports are in a 2 x 2 stacked RJ-45 jack.

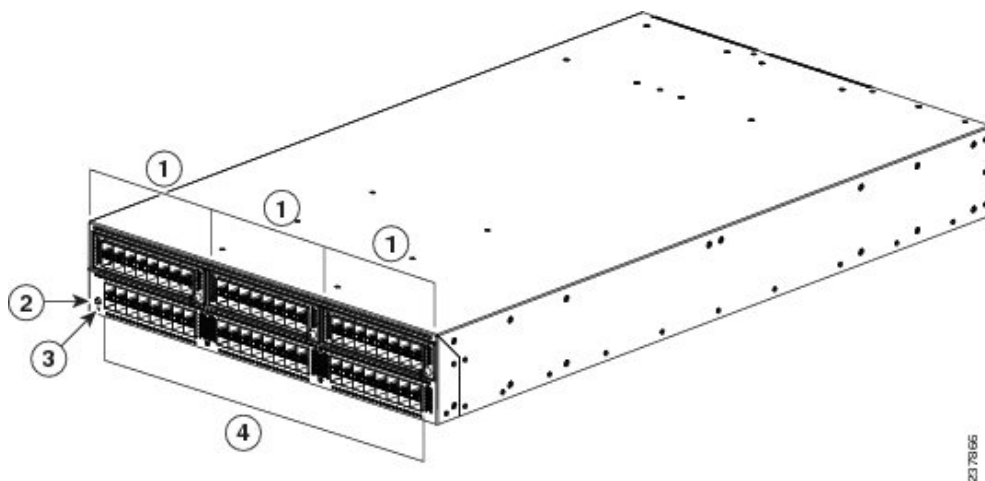
Figure 6: Management and Console Ports Closeup



1	Beaconing LED/button	5	Network management port
2	System Status LED	6	Console port
3	UCS cross connect port L1	7	USB port
4	UCS cross connect port L2		

The rear of the Cisco UCS 6296 UP chassis has 48 fixed 10-Gigabit Ethernet data ports on the bottom and three slots for optional expansion modules on top.

Figure 7: Rear View of the Cisco UCS 6296 UP



1	Expansion modules, shown here with three 16-port Universal GEM2 modules	3	System status LED
2	Identifier LED	4	48 fixed 1- and 10-Gigabit Ethernet ports

UCS Unified Port Expansion Module

Expansion modules allow Cisco UCS 6200 Series Fabric Interconnect to be configured as cost-effective 10-Gigabit Ethernet fabric interconnects and as I/O consolidation platforms with native Fibre Channel connectivity. The Cisco UCS 6248 UP has one slot for an optional expansion module. The Cisco UCS 6296 has three slots for an optional expansion module. Only the 16-port UCS E16UP hot-pluggable expansion module using the small form factor pluggable plus (SFP+) interface is supported.

Figure 8: UCS E16UP GEM

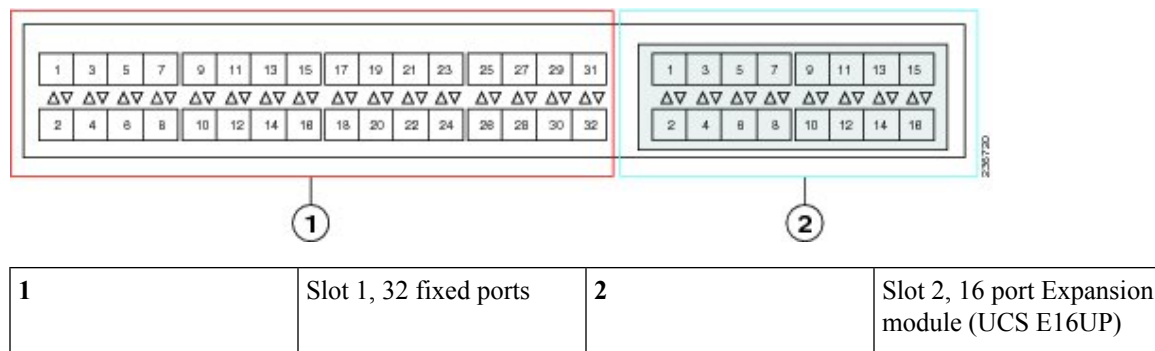


Cisco UCS 6248 UP Port Numbering

Each individual port is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right.

There are 32 to 48 ports on the Cisco UCS 6248 UP, depending on whether an expansion module is installed. Each individual port is numbered, and groups of ports are numbered based on their function. The ports are numbered from top to bottom and left to right.

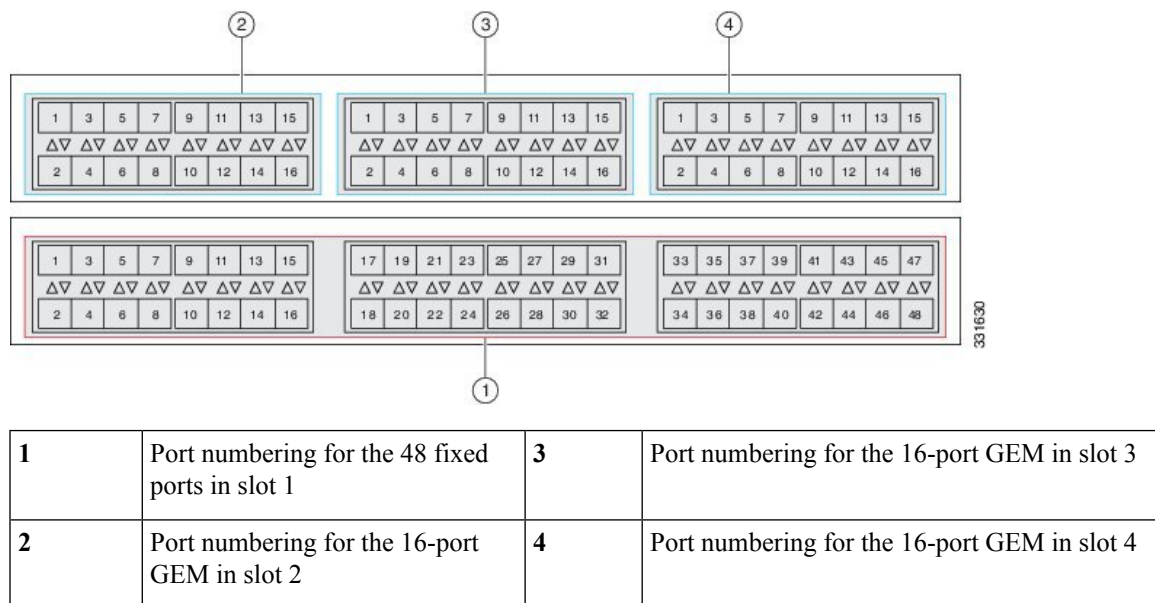
Figure 9: Port Numbering of the Cisco UCS 6248UP with an Expansion Module



Cisco UCS 6296 UP Port Numbering

Each port on the Cisco UCS 6296 UP is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right. The 48 fixed ports support 8-, 4-, 2-, or 1-Gbps Fibre Channel transceivers and 1- or 10-Gigabit Ethernet transceivers.

Figure 10: Port Numbering of Fixed Ports and Universal Port Expansion Modules

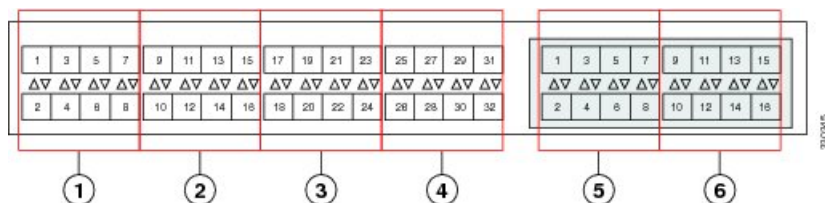


Cabling Considerations for Fabric Port Channels

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

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

Figure 11: Port Groups for Fabric Port Channels

**Caution**

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

**Caution**

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

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

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

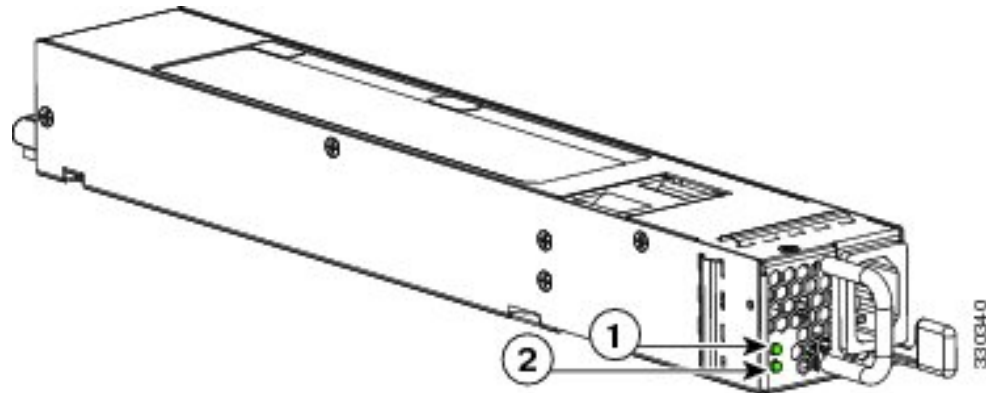
Power Supplies

Table 2: Power Supply Models

Cisco PID	Fabric Interconnect	Source	Wattage
UCS-PSU-6248UP-AC	Cisco UCS 6248 UP	110 VAC	390
UCS-PSU-6248UP-DC	Cisco UCS 6248 UP	-48 VDC	390
UCS-PSU-6296UP-AC	Cisco UCS 6296 UP	110 VAC	680

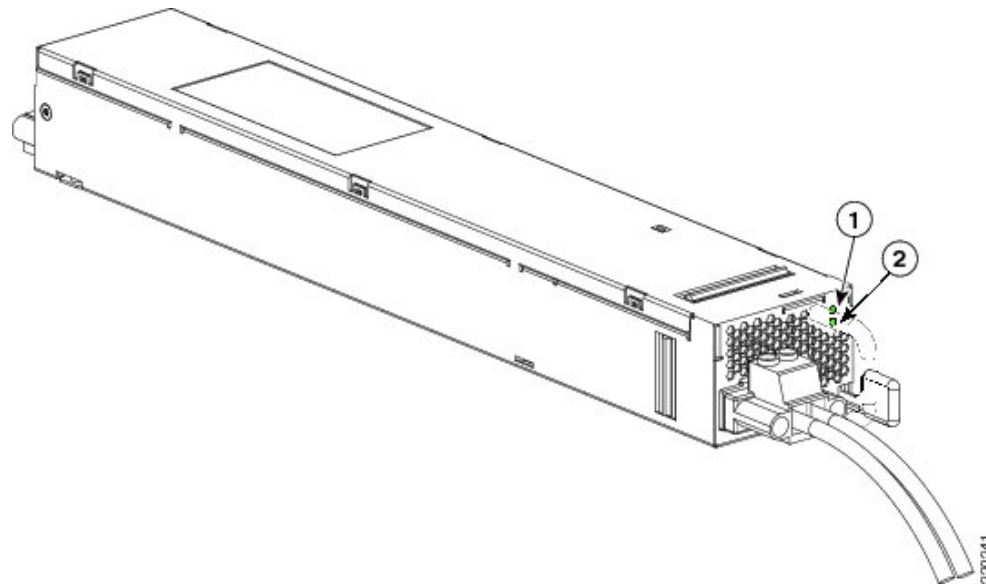
The fabric interconnect uses a front-end power supply. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the fabric interconnect is fully functional with one power supply. Power supplies have two LEDs: one for power status and one for failure condition.

Figure 12: AC Power Supply for the Cisco UCS 6248 UP Fabric Interconnect



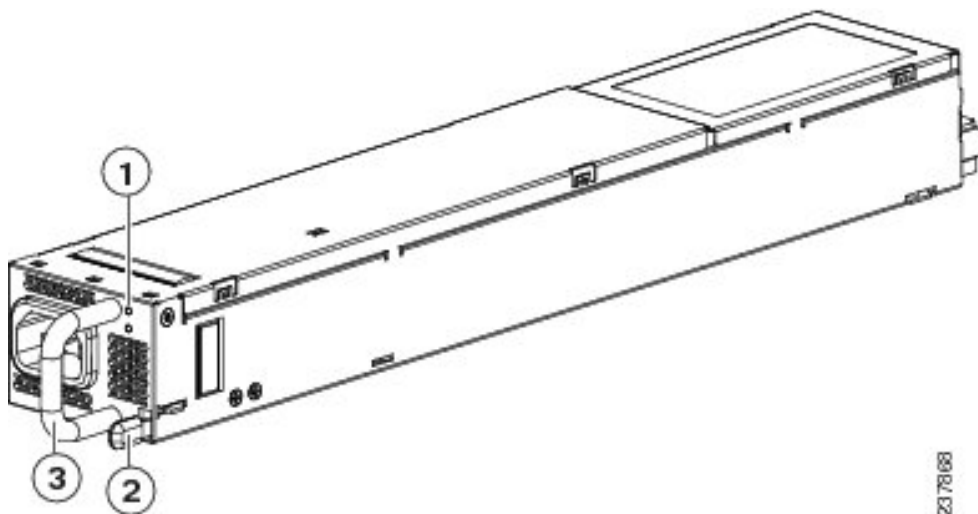
1	Fault LED	2	Power LED
---	-----------	---	-----------

Figure 13: DC Power Supply for the Cisco UCS 6248 UP Fabric Interconnect



1	Amber LED indicates a failure condition.	2	Green LED indicates the input power status.
---	--	---	---

Figure 14: Power Supply for the Cisco UCS 6296 UP Switch



1	Failure (top) and Power (bottom) LEDs	3	Release lever
2	Handle		

Table 3: Power Supply LED Descriptions

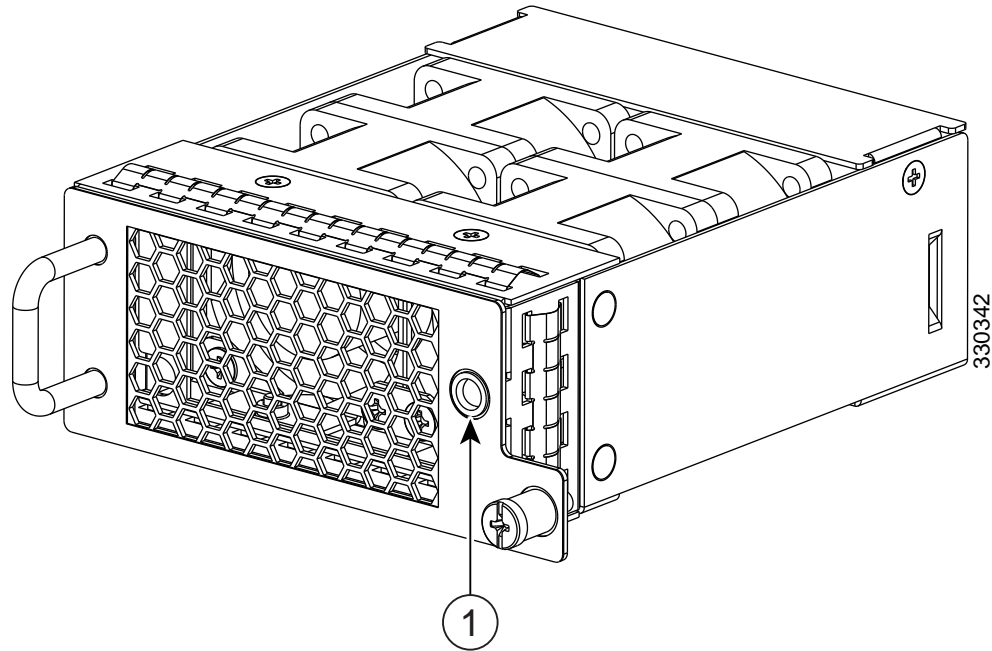
Power Supply Condition	Power LED Status	Fail LED Status
No AC power to all power supplies.	Off	Off
Power supply failure, including over voltage, over current, over temperature, and fan failure.	Off	On
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	1 Hz Blinking
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off.	1 Hz blinking	Off
Power supply on and OK.	On	Off

If one power supply is installed in the chassis, but the other power supply slot is empty, a blank filler panel (N10-S1BLKP=) should be used to cover the empty slot.

Fan Module

The Cisco UCS 6248 UP fabric interconnect has slots for two fan modules (also called fan trays). Each fan module houses four fans. The combination of four fans per module and two modules provides the chassis with eight fans.

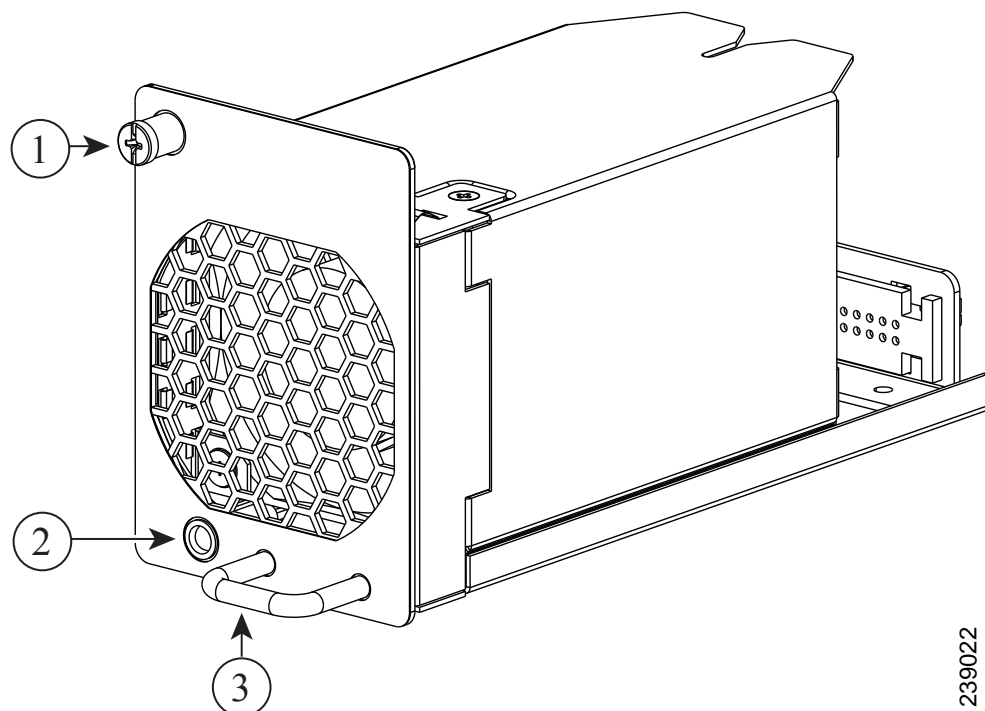
Figure 15: Cisco UCS 6248 UP Fan Module (UCS-FAN-6248UP=)

**1**

Fan Tray Status LED

The Cisco UCS 6296 UP switch has four fan modules with one fan each.

Figure 16: Cisco UCS 6296 UP Fan Module



239022

1	Captive screw	3	Handle
2	Status LED		

The bicolor fan module LED indicates fan tray health. Green indicates normal operation, while amber indicates a fan failure.

LED Descriptions

The fabric interconnect has three chassis status LEDs.

Table 4: LEDs for the Cisco UCS Fabric Interconnect

LED	Location	Function	Color	Status	Description
System Status LED	Front	Power/Health	Green	Solid On	System is on and operating normally
				Off	Switch is powered off
			Amber	On	Fault condition

LED	Location	Function	Color	Status	Description
Fan Tray Status	Fan trays (front)	Fan tray health indicator (multi color)	Green	On	Fan tray is operating normally
			Amber	On	Fan failure has occurred within the fan tray
PSU Status	Power supply (front)	PSU Health (multi color)	Green	OFF	No AC power to power supply
				Solid On	Power supply on and OK
			Amber	Solid On	Power supply failures, overvoltage, overcurrent, overtemperature
				1 Hz blinking	AC present, 3.3 VSB on, PSU is off
				OFF	Operating normally
Beaconing	Front of chassis	Identify selected chassis	Blue	Solid on	Chassis is selected
				Off	Chassis is not selected

Port Level LEDs

There are port activity LEDs on the chassis and on the expansion modules.

Table 5: Port LEDs

Color	Description
Green (blinking)	Link is up, enabled, and active.
Amber	Link is administratively disabled.
Amber (blinking)	POST or operational error.
Off	Link is down.

Supported Transceivers

The fabric interconnect supports SFP+ Ethernet transceivers, SFP transceivers, and SFP Fibre Channel transceivers. Specifications for these transceivers are at this URL:

http://www.cisco.com/en/US/docs/interfaces_modules/transceiver_modules/installation/note/78_15160.html

SFP+ Transceivers

The high bandwidth of 10-Gigabit Ethernet poses challenges to transmissions that are met by the transceiver and cabling options supported by the Cisco UCS 6200 platform.

The enhanced SFP+ 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.

Table 6: Supported Transceivers

Cisco SFP	Description
FET-10G	10G SFP+ Fabric extender transceiver module. The FET-10G SFP is only supported on connections from a 6200 Fabric Interconnect to a Nexus 2000 or UCS IOM when the port is setup as a server port. This SFP cannot be used for uplink ports.
SFP-10G-SR	10GBASE-SR SFP+ module (multimode fiber [MMF])
SFP-10G-LR	10GBASE-LR SFP+ module (single-mode fiber [SMF])
SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1 m (Twinax cable)
SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3 m (Twinax cable)
SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5 m (Twinax cable)
SFP-H10GB-ACU7M	10GBASE-CU SFP+ cable 7 m (Twinax cable)
SFP-H10GB-ACU10M	10GBASE-CU SFP+ cable 10 m (Twinax cable)
GLC-T	1000BASE-T SFP
GLC-SX-MM	GE SFP, LC connector SX transceiver (MMF)
GLC-LH-SM	GE SFP, LC connector LX/LH transceiver (SMF)
SFP-GE-T	1000BASE-T SFP, extended temperature range
SFP-GE-S	GE SFP, LC connector SX transceiver (MMF), extended temperature range and digital optical monitoring (DOM)

Cisco SFP	Description
SFP-GE-L	GE SFP, LC connector LX/LH transceiver (SMF), extended temperature range and DOM
DS-SFP-FC4G-SW	4-Gbps Fibre Channel SW SFP, LC (for FC configured Unified ports)
DS-SFP-FC4G-LW	4-Gbps Fibre Channel LW SFP, LC (for FC configured Unified ports)
DS-SFP-FC8G-SW	8-Gbps Fibre Channel SW SFP+, LC (for FC configured Unified ports)
DS-SFP-FC8G-LW	8-Gbps Fibre Channel LW SFP+, LC (for FC configured Unified ports)



Note The maximum length of fiber optic runs is limited to 300 meters. This is imposed by our use of 802.3X/802.1Qbb Priority Pauses. SFP-10G-LR is supported between fabric interconnect and FEX, but the 300 m limit still applies.

SFP Transceivers

The SFP 1 -Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package.

Table 7: Supported SFP Optical Transceivers

Model	Description
GLC-T	1-Gigabit Ethernet copper SFP module
GLC-SX-MM	1-Gigabit Ethernet—short range (550m max) SFP module
GLC-LH-SM	1-Gigabit Ethernet—long range (10km) SFP module



Note The maximum length of fiber optic runs is limited to 300 meters. This is imposed by our use of 802.3X/802.1Qbb Priority Pauses. SFP-10G-LR is supported between fabric interconnect and I/O Module, but the 300 m limit still applies.

SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module.

Table 8: Cables Used with the 10-Gbps Ethernet SFP+ Transceivers

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ 1-meter cable
SFP-H10GB-CU3M	10GBASE-CU SFP+ 3-meter cable
SFP-H10GB-CU5M	10GBASE-CU SFP+ 5-meter cable
SFP-H10GB-ACU7M=	10GBASE-CU SFP+ 7-meter cable
SFP-H10GB-ACU10M=	10GBASE-CU SFP+ 10-meter cable

On the Cisco UCS 6200 platforms, you can use an innovative Twinax copper cable that connects to standard SFP+ connectors for in-rack use, and on optical cable for longer cable runs.

For in-rack or adjacent-rack cabling, the Cisco UCS 6200 platform supports SFP+ direct-attach 10-Gigabit Ethernet copper, which integrates transceivers with Twinax cables into an energy efficient, low-cost, and low-latency solution. SFP+ direct-attach 10-Gigabit Twinax copper cables use only 0.1 watts of power per transceiver and introduce only approximately 0.25 microsecond of latency per link.

For longer cable runs, the Cisco UCS 6200 platform supports multimode, short-reach optical SFP+ transceivers. These optical transceivers use approximately 1 W per transceiver and have a latency of less than 0.1 microsecond.

Table 9: Supported Cables

Connector (Media)	Cable	Distance	Power (each side)	Transceiver Latency (Link)	Standard
SFP+ CU copper	Twinax	5 m	~ 0.1 W	~ 0.1 microseconds	SFF 8431
SFP+ ACU copper	Active Twinax	7 m/ 10 m	~ 0.5 W	~ 6.8 nanoseconds	SFF 8461
SFP+ SR MMF and SR	MM OM2 MM OM3	82 m/ 300 m	1 W	~ 0 microseconds	IEEE 802.3ae

SFP Fibre Channel Transceivers

The Cisco UCS 6200 series fabric interconnects support multimode 850 nm 4 Gbps and 8 Gbps SFPs with 150 m reach.

Table 10: SFP Fiber Channel Transceivers

Model	Description
Cisco DS-SFP-FC4G-SW	4 Gbps Fibre Channel-SW SFP, LC (for FC configured Unified ports)

Model	Description
Cisco DS-SFP-FC4G-LW	4 Gbps Fibre Channel-LW SFP, LC, (10 km reach) (for FC configured Unified ports)
Cisco DS-SFP-FC8G-SW	8-Gbps Fibre Channel SW SFP+, LC (for FC configured Unified ports)
Cisco DS-SFP-FC8G-LW	8-Gbps Fibre Channel LW SFP+, LC (for FC configured Unified ports)

**Note**

The maximum length of fiber optic runs from the fabric interconnect to a chassis is limited to 300 meters. This restriction is imposed by the use of 802.3X/802.1Qbb Priority Pauses.

