

Product Overview

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Cisco UCS Fabric Interconnect Overview

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

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

Cisco UCS 6454 Fabric Interconnect

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

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

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

The Cisco UCS 6454 Fabric Interconnect supports:

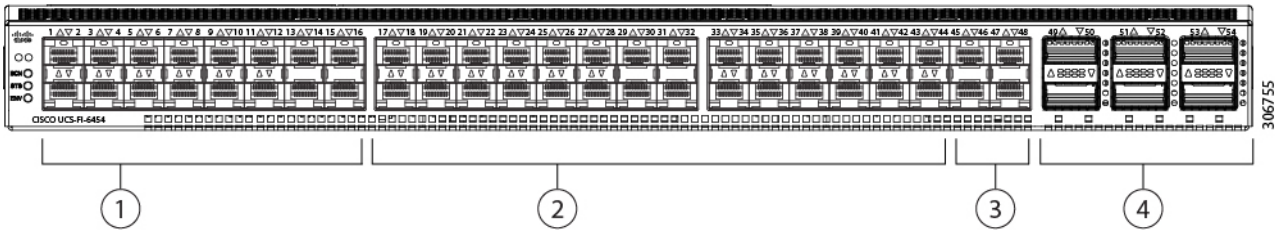
- Maximum of 8 FCoE port channels
- Or 4 SAN port channels
- Or a maximum of 8 SAN port channels and FCoE port channels (4 each)

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

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

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

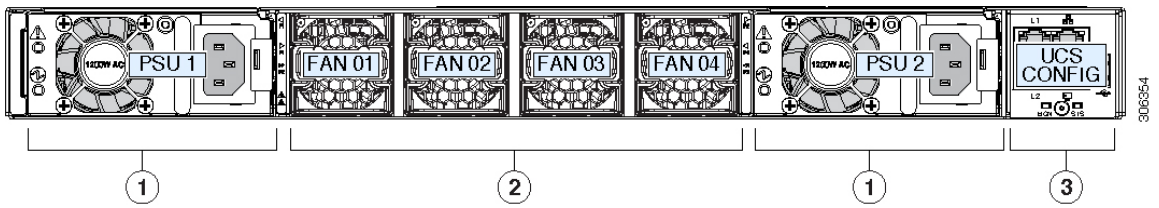
Figure 1: Cisco UCS 6454 Fabric Interconnect Rear View



1	Ports 1-16 (Unified Ports 10/25 Gbps Ethernet or FCoE or 8/16/32 Gbps Fibre Channel) **Note** When using Cisco UCS Manager releases earlier than 4.0(4), only ports 1-8 are Unified Ports.	2	Ports 17-44 (10/25 Gbps Ethernet or FCoE) **Note** When using Cisco UCS Manager releases earlier than 4.0(4), ports 9-44 are 10/25 Gbps Ethernet or FCoE.
3	Ports 45-48 (1/10/25 Gbps Ethernet or FCoE)	4	Uplink Ports 49-54 (40/100 Gbps Ethernet or FCoE) Each of these ports can be 4 x 10/25 Gbps Ethernet or FCoE uplink ports when using an appropriate breakout cable.

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

Figure 2: Cisco UCS 6454 Fabric Interconnect Front View



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

Cisco UCS 64108 Fabric Interconnect

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

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

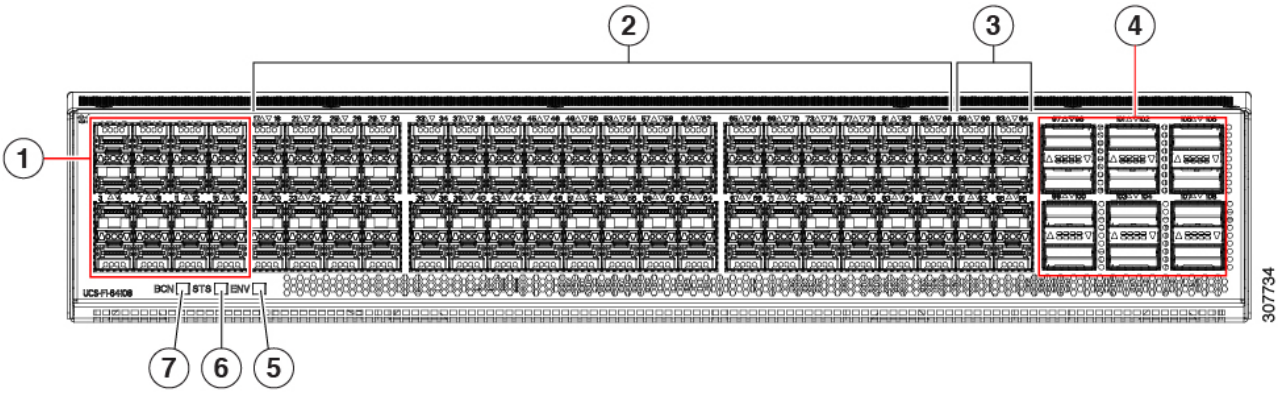
- Maximum of 8 FCoE port channels
- Or 4 SAN Ports
- Or a maximum of 8 SAN port channels and FCoE port channels (4 each)

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

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

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

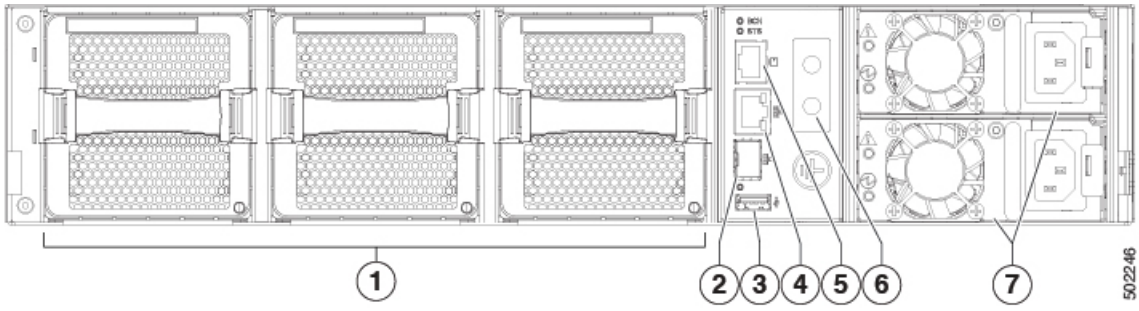
Figure 3: Cisco UCS 64108 Fabric Interconnect Rear View



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

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

Figure 4: Cisco UCS 64108 Fabric Interconnect Front View



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

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

Ports on the Cisco UCS Fabric Interconnect

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

Note When you configure a port on a Fabric Interconnect, the administrative state is automatically set to enabled. If the port is connected to another device, this may cause traffic disruption. The port can be disabled and enabled after it has been configured.

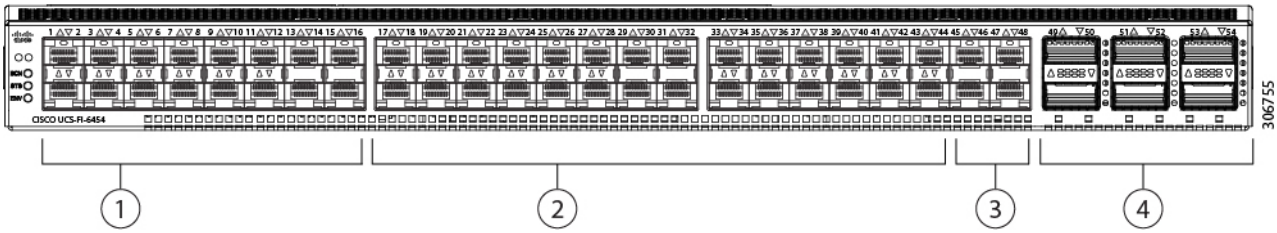
The following table summarizes the Cisco UCS Fabric Interconnects.

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

Port Speeds and Types

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

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



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

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

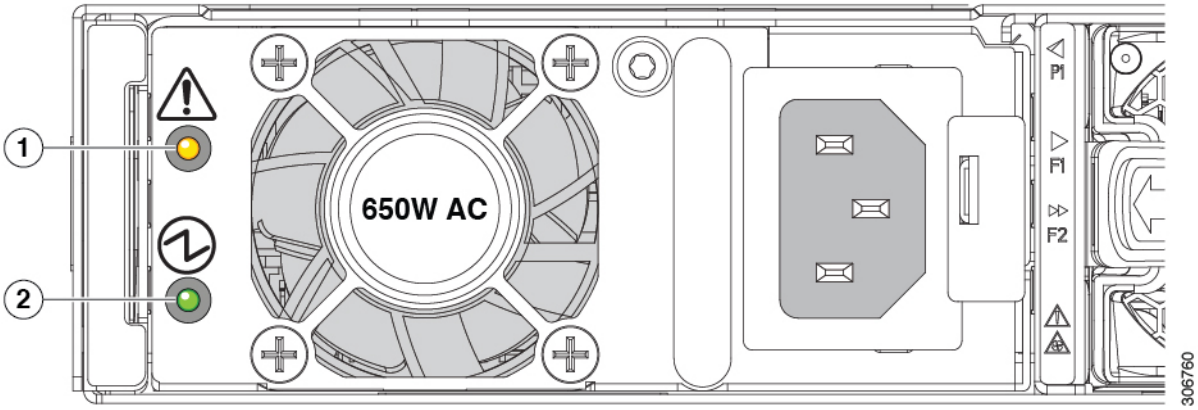
Power Supplies

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

Table 1: Power Supply Models

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

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



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

1	Fault or Error LED	2	Power LED

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

Fan Modules

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

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

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

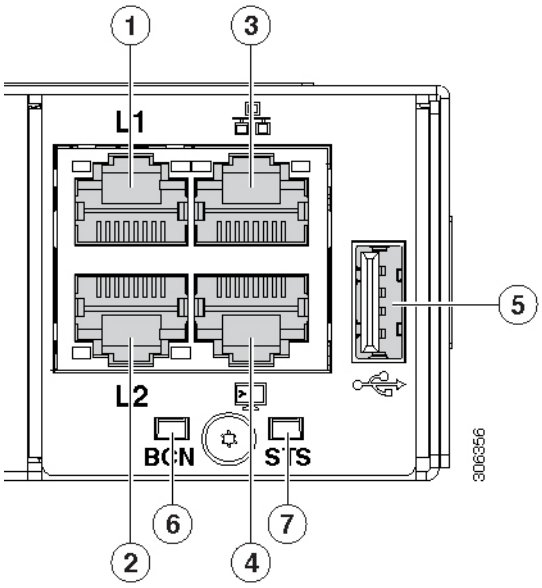
Cisco UCS 64108	UCS-FAN-64108

Front Panel Ports and LEDs

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

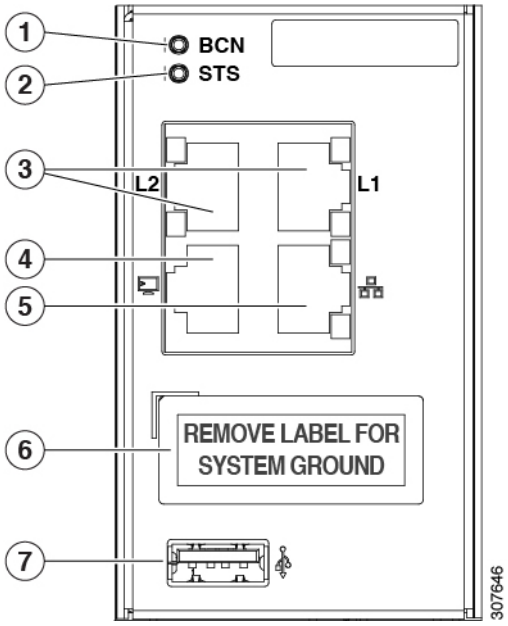
Note When connecting L1 and L2 ports between FIs, the maximum supported length of Ethernet CAT5e or CAT6 cable is 100 meters.

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



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

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



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

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

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

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

Network Management Port LEDs

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

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

L1 and L2 Port LEDs

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

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

Rear Panel System Environment LED

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

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

Rear Panel Port LEDs

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

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

Supported Transceivers

For a complete list of the supported transceivers and cables with ordering PIDs, refer to Product Specifications in the *Cisco UCS 6400 Series Fabric Interconnects Data Sheet*.