Cisco Firepower Management Center 1000, 2500, and 4500 Hardware Installation Guide

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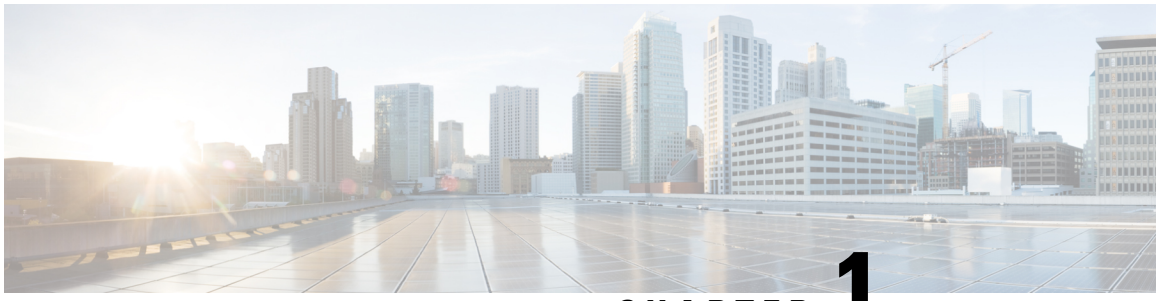


CHAPTER 1

Overview

Features

The Cisco Firepower Management Center (FMC) 1000, 2500, and 4500 management appliances support Cisco Firepower version 6.2 and later.

Note The FMC 1000, 2500, and 4500 are certified for Common Criteria (CC) and Federal Information Processing Standards (FIPS) 140 beginning in Cisco Firepower version 6.2.2. See the "Security Certifications Compliance" topic in the "Appliance Platform Settings" chapter in the Firepower Management Center Configuration Guide for the instructions on how to enable security certifications compliance.

The following table lists the features of the FMC 1000, 2500, and 4500.

Table 1: FMC 1000, 2500, and 4500 Features

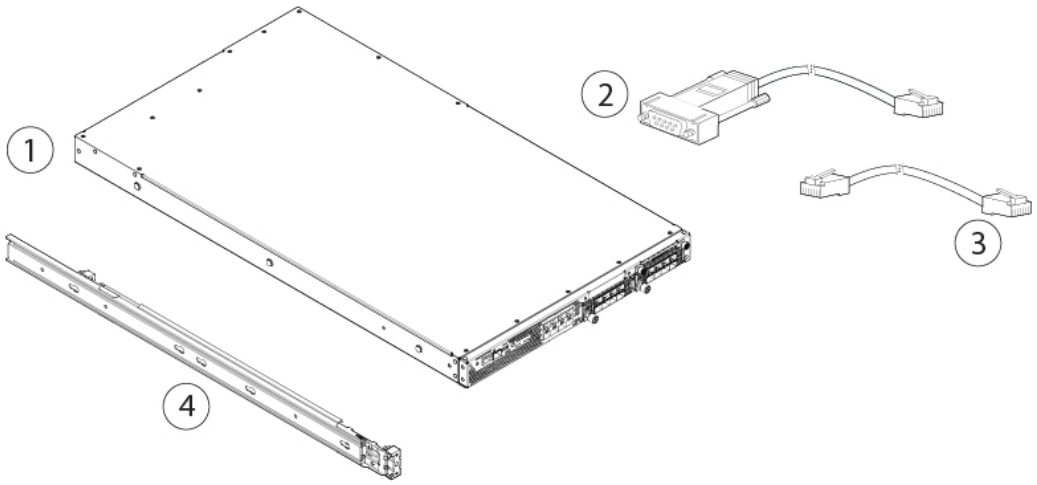
Feature	1000	2500	4500
Form factor	1 RU		
Rack mount	Yes Standard 19-in. (48.3 cm) 4-post EIA rack		

Feature	1000	2500	4500
Airflow	Front to rear Cold aisle to hot aisle		
Asset pullout card	Yes Displays serial number		
Grounding hole	Yes Use is optional. The supported AC power supplies have internal grounding, so no additional chassis grounding is required.		
Locator beacon	Yes		
Power switch	Yes		
Processor	1 Intel E5-2620 V4 CPU	2 Intel E5-2620 V4 CPUs	2 Intel E5-2640 V4 CPUs
Memory	32 GB	64 GB	128 GB
RDIMMs	Four 8-GB DDR4-2400-MHz RDIMMs	Eight 8-GB DDR4-2400-MHz RDIMMs	Eight 16-GB DDR4-2400-MHz RDIMMs
Management ports	1-GB BASE-T Ethernet port (eth0)	One 1-GB BASE-T Ethernet port (eth0) Two 10-GB SFP+ ports (eth1 and eth2)	
USB ports	2		
VGA port	One 3-row 15-pin DE-15 connector Enabled by default.		
SFP ports	—	2 fixed SFP+ ports	
SFP+	—	FS2K-NIC-SFP FS4K-NIC-SFP	
Serial console port	1-GB RJ-45 serial port running RS-232 (RS-232D TIA-561)		
System power	Two 770-W AC power supplies (hot-swappable and redundant as 1+1)		
Power consumption	2626 BTU/hr		
Fans	6 fans for front-to-rear cooling		
Storage	Two 900-GB SAS drives	Four 600-GB SAS drives	Six 800-GB SSDs

Package Contents

The following figure shows the package contents for the FMC 1000, 2500, and 4500. Note that the contents are subject to change and your exact contents might contain additional or fewer items.

Figure 1: Package Contents



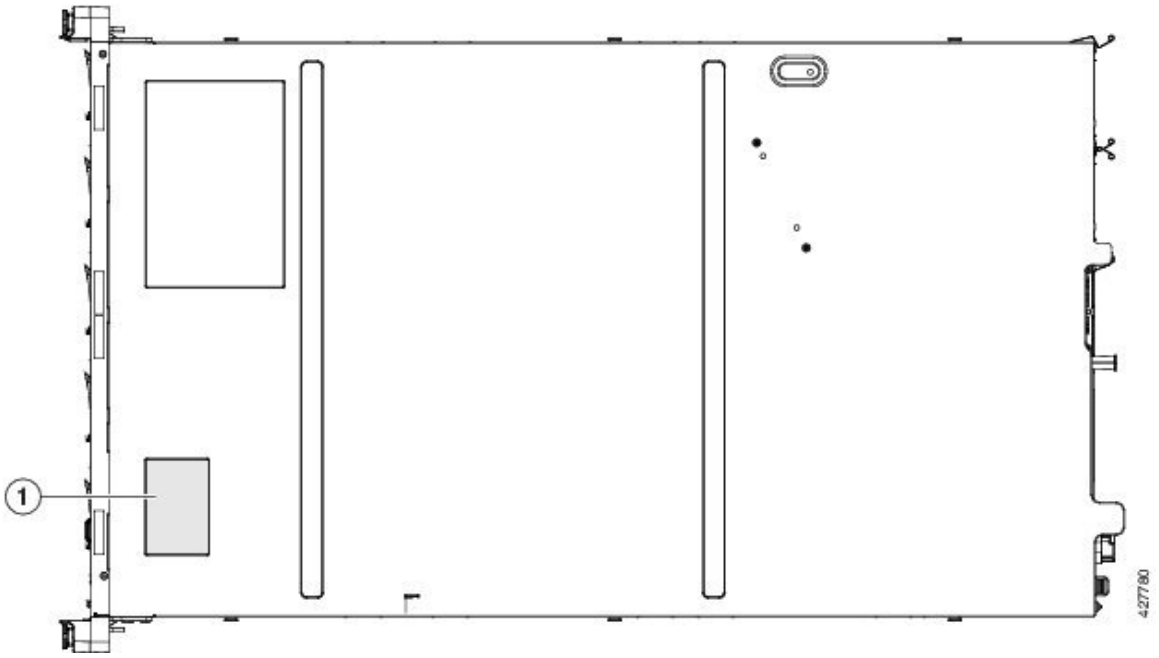
1	Chassis	**2**	RJ-45 to DP9-RS232 console cable (Cisco part number 72-3383-XX)
3	RJ-45 to RJ-45 Cat 5 Ethernet cable, yellow 6-feet long (Cisco part number 72-1482-XX)	**4**	Cisco 1-RU rail kit (Cisco part number 800-43376-XX)

Serial Number Location

The serial number (SN) for the FMC 1000, 2500, and 4500 is printed on the asset pullout card located on the front panel. For the location of the asset pullout card, see Front Panel, on page 4.

The serial number is also on a label on the cover of the chassis as shown in the following figure.

Figure 2: Serial Number Location on Cover

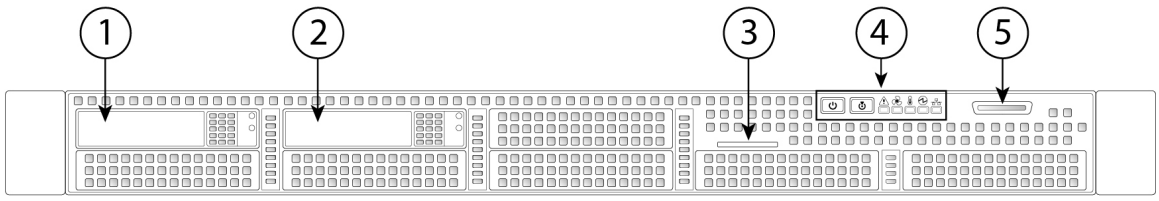


1	Serial number label		

Front Panel

The following figure shows the front panel features and disk-drive configuration for the FMC 1000. See Front Panel LEDs and Buttons, on page 5 for a description of the LEDs.

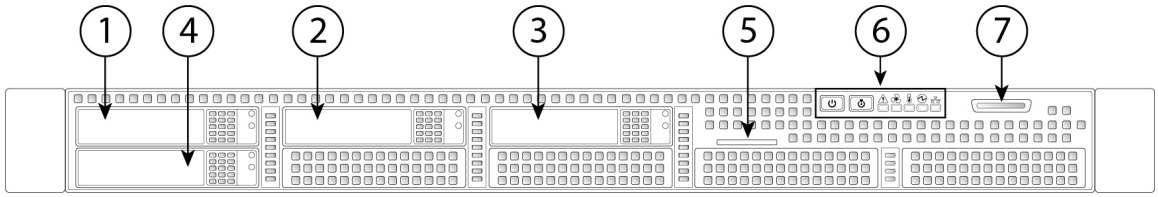
Figure 3: FMC 1000 Front Panel Features



1	SAS drive 1	**2**	SAS drive 2
3	Asset pullout card	**4**	Control panel LEDs
5	Keyboard, video, and mouse (KVM) port This port is not supported. Use the VGA and USB keyboard ports instead.		

The following figure shows the front panel features and disk-drive configuration for the FMC 2500. See Front Panel LEDs and Buttons, on page 5 for a description of the LEDs.

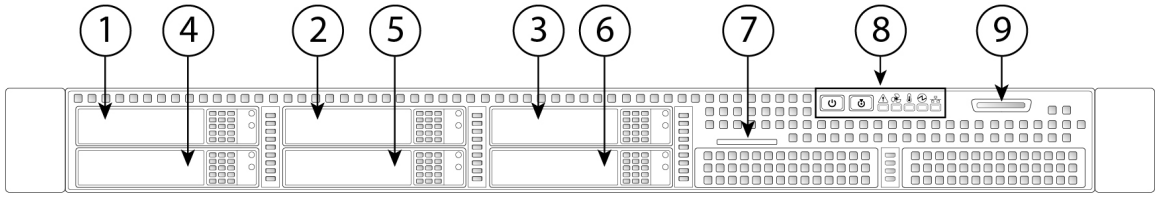
Figure 4: FMC 2500 Front Panel Features



1	SAS drive 1	**2**	SAS drive 2
3	SAS drive 3	**4**	SAS drive 4
5	Asset pullout card	**6**	Control panel LEDs
7	This port is not supported. Use the VGA and USB keyboard ports instead.		

The following figure shows the front panel features and disk-drive configuration for the FMC 4500. See Front Panel LEDs and Buttons, on page 5 for a description of the LEDs.

Figure 5: FMC 4500 Front Panel Features

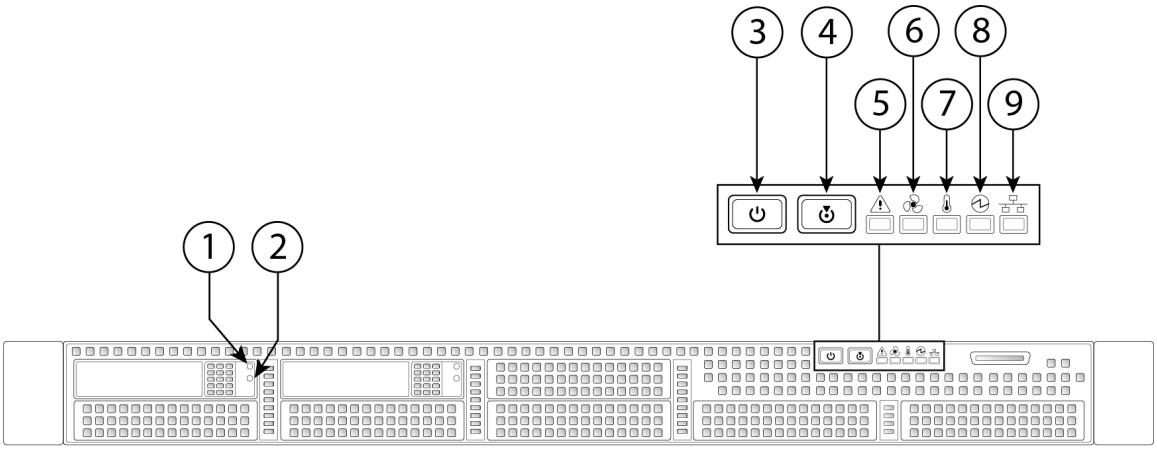


1	SSD drive 1	**2**	SSD drive 2
3	SSD drive 3	**4**	SSD drive 4
5	SSD drive 5	**6**	SSD drive 6
7	Asset pullout card	**8**	Control panel LEDs
9	This port is not supported. Use the VGA and USB keyboard ports instead.		

Front Panel LEDs and Buttons

The following figure shows the front panel LEDs, buttons, and their descriptions for the FMC 1000, 2500, and 4500.

Figure 6: Front Panel LEDs and Buttons



1	Disk-drive fault LED • Unlit—The hard drive is operating properly. • Amber—Drive fault detected. • Amber, flashing—The device is rebuilding. • Amber, flashing in 1-second intervals—Drive locate function activated.	**2**	Disk-drive activity LED • Unlit—There is no hard drive in the hard drive tray (no access, no fault). • Green—The hard drive is ready. • Green, flashing—The hard drive is reading or writing data.
3	Power button/power status LED • Unlit—There is no AC power to the appliance. • Amber—The appliance is in standby power mode. • Green—The appliance is in main power mode. Power is supplied to all appliance components.	**4**	Unit identification button/LED • Unlit—The unit identification function is not in use. • Blue—The unit identification function is activated.

5	System status LED
	• Green—The appliance is running in normal operating condition.
	• Green, flashing—The appliance is performing system initialization and memory check.
	• Amber—The appliance is in a degraded operational state. For example:
	  • Power supply redundancy is lost.
	  • CPUs are mismatched.
	  • At least one CPU is faulty.
	  • At least one DIMM is faulty.
	  • At least one drive in a RAID configuration failed.
	• Amber, flashing—The appliance is in a critical fault state. For example:
	  • Boot failed.
	  • Fatal CPU and/or bus error is detected.
	  • The appliance is in an over-temperature condition.
		6	Fan status LED
			• Green—All fans are operating properly.
			• Amber—One or more fans breached the critical threshold.
			• Amber, flashing—One or more fans breached the unrecoverable threshold.

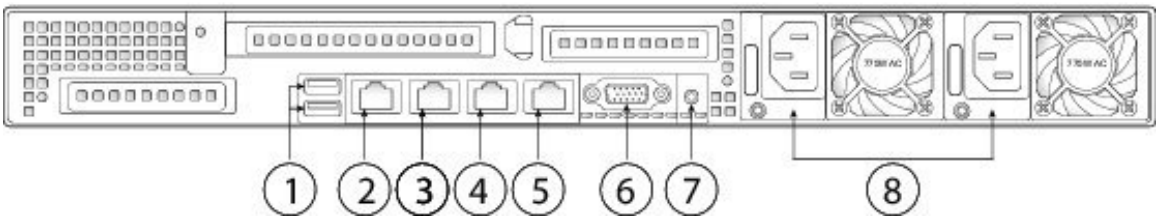
7	Temperature status LED • Green—The appliance is operating at normal temperature. • Amber—One or more temperature sensors breached the critical threshold. • Amber, flashing—One or more temperature sensors breached the unrecoverable threshold.	**8**	Power supply status LED • Green—All power supplies are operating normally. • Amber—One or more power supplies are in a degraded operational state. • Amber, flashing—One or more power supplies are in a critical fault state.

9	Network link activity LED • Unlit—The Ethernet link is idle. • Green—One or more Ethernet ports are link-active, but there is no activity. • Green, flashing—One or more Ethernet ports are link-active with activity.		

Rear Panel

The following figure shows the rear panel of the FMC 1000.

Figure 7: FMC 1000 Rear Panel

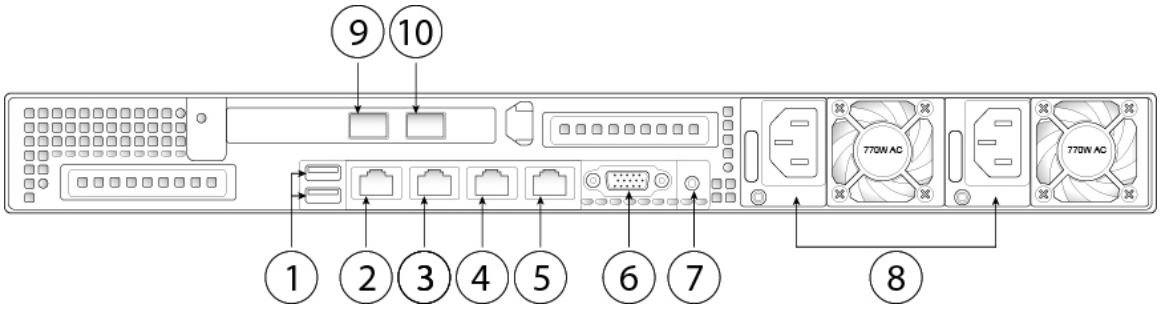


1	2 USB keyboard ports You can connect a keyboard, and along with a monitor on the VGA port, you can access the console.	**2**	CIMC interface (labeled "M") This interface is not supported.
3	Serial console port This port is disabled by default; use the VGA port and keyboard USB port instead.	**4**	eth0 management interface (labeled "1") Gigabit Ethernet 10/100/1000 Mbps interface, RJ-45 eth0 is the default management interface.
5	eth1 management interface (labeled "2") Gigabit Ethernet 10/100/1000 Mbps interface, RJ-45	**6**	VGA interface Enabled by default.
7	Unit identification button/LED	**8**	Two 770-W AC power supplies

Note Although the Cisco Integrated Management Controller (CIMC) is not supported on the FMC, you can use Lights-Out-Management (LOM) on the default management interface (eth0) on a Serial Over LAN (SOL) connection to remotely monitor or manage the FMC system. For information about using LOM and SOL, see the Firepower Management Center Getting Started Guide for your model.

The following figure shows the rear panel of the FMC 2500 and 4500.

Figure 8: FMC 2500 and 4500 Rear Panel

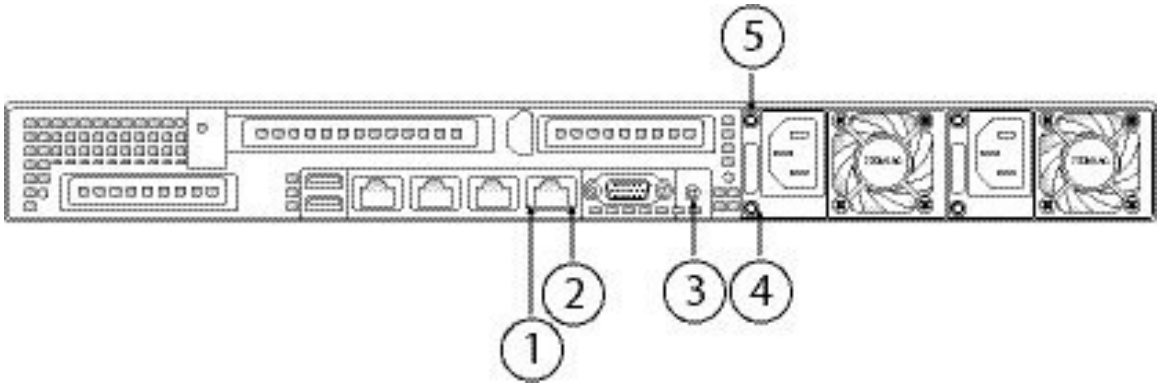


1	2 USB keyboard ports You can connect a keyboard, and along with a monitor on the VGA port, you can access the console.	**2**	CIMC interface (labeled "M") This interface is not supported.
3	Serial console port This port is disabled by default; use the VGA port and keyboard USB port instead.	**4**	eth0 management interface (labeled "1") Gigabit Ethernet 10/100/1000 Mbps interface, RJ-45 eth0 is the default management interface.
5	eth1 management interface (labeled "2") Gigabit Ethernet 10/100/1000 Mbps interface, RJ-45	**6**	VGA interface Enabled by default.
7	Unit identification button/LED	**8**	Two 770-W AC power supplies
9	eth2 management interface 10-Gigabit Ethernet SFP+ support **Note** Use only Cisco-supported SFP+ transceivers.	**10**	eth3 management interface 10-Gigabit Ethernet SFP+ support **Note** Use only Cisco-supported SFP+ transceivers.

Rear Panel LEDs and Buttons

The following figure shows the rear panel LEDs and buttons:

Figure 9: Rear Panel LEDs and Buttons



1	Interface link speed LED Located to the left of each port. • Unlit—Link speed is 10 Mbps. • Amber—Link speed is 100 Mbps. • Green—Link speed is 1 Gbps.	**2**	Interface link status LED Located to the right of each port. • Unlit—No link is present. • Green—Link is active. • Green, flashing—Traffic is present on the active link.
3	Unit identification button/LED • Unlit—The unit identification LED is not in use. • Blue—The unit identification LED is activated.	**4**	Power supply status LED • Unlit—No AC input (12-V main power off, 12-V standby power off). • Green, flashing—12-V main power off; 12-V standby power on. • Green—12-V main power on; 12V standby power on. • Amber, flashing—Warning detected but 12-V main power on. • Amber—Critical error detected; 12-V main power off.

5	Power supply fault LED • Unlit—The power supply is operating normally. • Amber, flashing—An event warning threshold has been reached, but the power supply continues to operate. • Amber—A critical fault threshold has been reached, causing the power supply to shut down (for example, a fan failure or an over-temperature condition).		

Power Supply

The following table lists the specifications for each 770-W AC power supply (Cisco part number FMC-PWR-AC-770W) used in the FMC 1000, 2500, and 4500.

Table 2: Power Supply Specifications

Description	Specification
Power consumption	1313 BTU/hr
AC input voltage range	Nominal range: 100–120 V AC, 200–240 V AC Range: 90–132 V AC, 180–264 V AC
AC input frequency	Nominal range: 50–60 Hz Range: 47–63 Hz
Maximum AC input current	9.5 A peak at 100-V AC 4.5 A peak at 208 V-AC
Maximum input volt amperes	950 VA at 100-V AC
Maximum output power for each power supply	770 W
Maximum inrush current	15 A (subcycle duration)
Maximum hold-up time	12 ms at 770 W
Power supply output voltage	12-V DC
Power supply standby voltage	12-V DC
Efficiency rating	Climate Savers Platinum Efficiency (80 Plus Platinum certified)
Form factor	RSP2

Description	Specification
Input connector	IEC320 C14

Hardware Specifications

The following table lists the hardware specifications for the FMC Center 1000, 2500, and 4500.

Table 3: FMC 1000, 2500, and 4500 Hardware Specifications

Specification	1000	2500	4500
Physical			
Form factor	1 RU		
Rack mountable	Yes Standard 19-in. (48.3 cm) 4-post EIA rack		
Dimensions (H x W x D)	1.7 x 16.9 x 29.8 in. (4.3 x 42.9 x 75.9 cm)		
Weight (fully loaded chassis)	32.2 lb (16.6 kg)	34.1 lb (16.8 kg)	36.0 lb (17.0 kg)
Airflow	Front to rear (cold aisle to hot aisle)		
Fans	6 fans for front-to-rear cooling		
Storage			
SAS	Two 900 GB RAID 1, 2.5 in., 10-K RPM, 4Kn, hot-swappable	Four 600 GB RAID 5, 2.5 in., 10-K RPM, 4Kn, hot-swappable	—
SSD	—	—	Six 800 GB RAID 6, 2.5 in., 10-K RPM, 4Kn, hot-swappable
Memory			
RDIMMs	32 GB Four 8-GB DDR4-2400-MHz	64 GB Eight 8-GB DDR4-2400-MHz	128 GB Eight 16-GB DDR4-2400-MHz
Power			
System power	Two 770-W AC power supplies		
Power consumption	2626 BTU/hr		

Specification	1000	2500	4500
Redundant power supplies	Yes Hot-swappable and redundant as 1+1		
Environmental			
Temperature	Operating: 41 to 95°F (5 to 35°C) Derate the maximum temperature by 1°C per every 305 meters of altitude above sea level. Nonoperating: –40 to 149°F (–40 to 65°C) when the appliance is stored or transported		
Humidity (RH)	10 to 90 % noncondensing		
Altitude	Operating: 0 to 10,000 ft Nonoperating: 0 to 40,000 ft when the appliance is stored or transported		
Sound power level	5.4 Bels (Measure A-weighted per ISO7779 LwAd) Operation at 73°F (23°C)		
Sound pressure level	37 Bels (Measure A-weighted per ISO7779 LwAd) Operation at 73°F (23°C)		

Product ID Numbers

The following table lists all of the Product IDs (PIDs) spares associated with the FMC 1000, 2500, and 4500.

Table 4: FMC 1000, 2500, and 4500 PIDs

PID	Description
FMC-PWR-AC-770W=	Cisco AC power supply 770-W
FMC1K-HDD-900G=	Cisco FMC 900-GB 12-GGB 10-K 2.5-inch SAS
FMC2K-HDD-600G=	Cisco FMC 600-GB 12-GGB 10-K 2.5-inch SAS
FMC4K-SSD-800G=	Cisco 800-GB 12-Gbps SAS SSD
UCSC-RAILB-M4=	Ball bearing rail kit

Power Cord Specifications

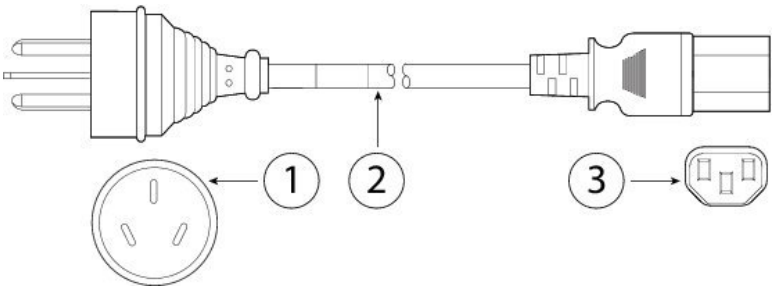
Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to the appliance. The jumper power cords for use in racks are available as an optional alternative to the standard power cords.

If you do not order the optional power cord with the system, you are responsible for selecting the appropriate power cord for the product. Using a incompatible power cord with this product may result in electrical safety hazard. Orders delivered to Argentina, Brazil, and Japan must have the appropriate power cord ordered with the system.

Note Only the approved power cords or jumper power cords provided with the appliance are supported.

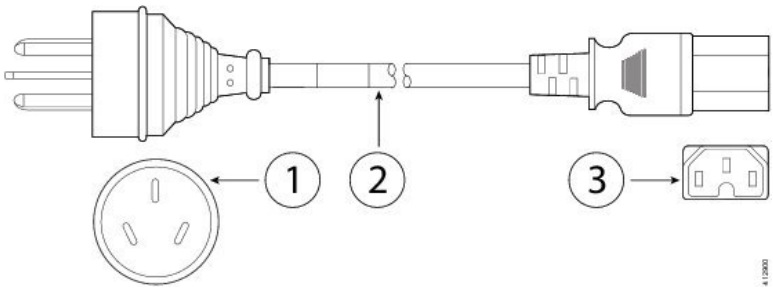
The following power cords are supported.

Figure 10: Argentina CAB-250V-10A-AR



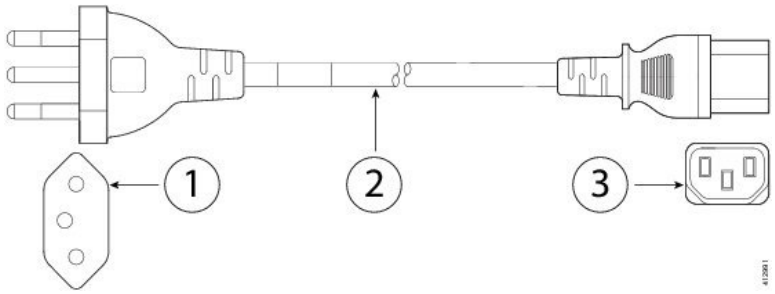
1	Plug: IRAM 2073	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C13		

Figure 11: Australia CAB-9K10A-AU



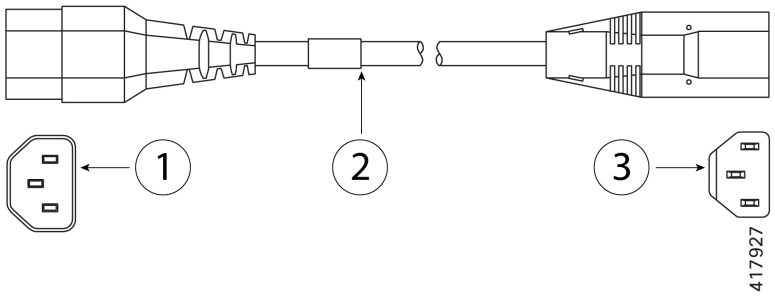
1	Plug: A.S. 3112-2000	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C15		

Figure 12: Brazil PWR-250V-10A-BZ



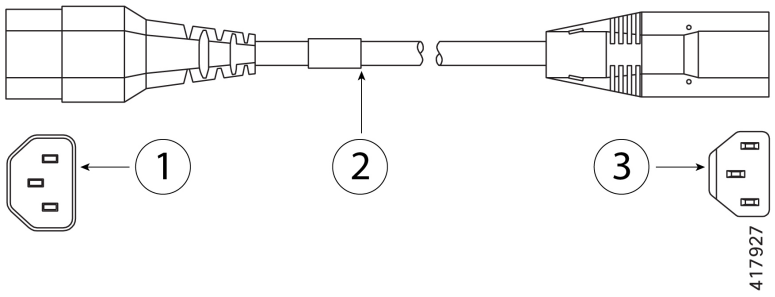
1	Plug: NBR 14136	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C13		

Figure 13: Cabinet Jumper CAB-C13-C14-2M



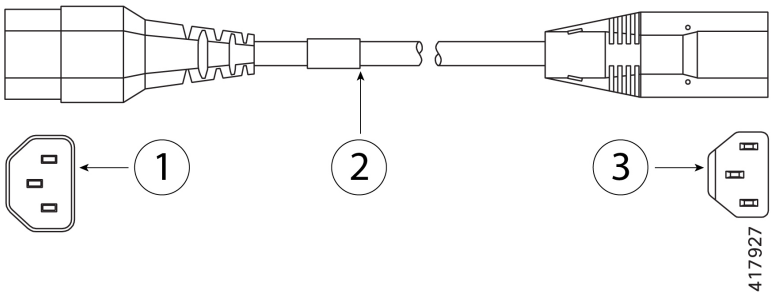
1	Plug: SS10A	**2**	Cord set rating: 10A, 250V
3	Connector: HS10S		

Figure 14: Cabinet Jumper CAB-C13-C14-AC



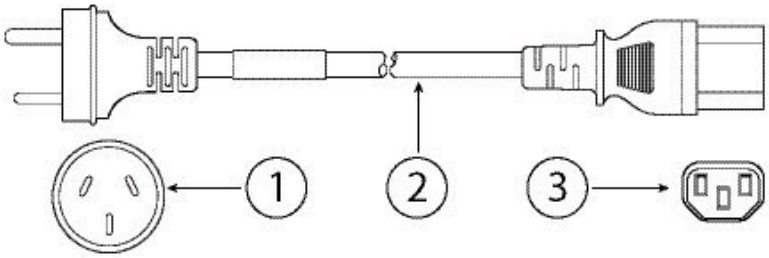
1	Plug: SS10A	**2**	Cord set rating: 10 A, 250 V
3	Connector: HS10S		

Figure 15: Cabinet Jumper CAB-C13-CBN



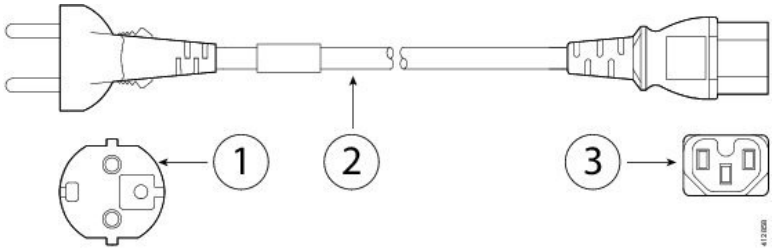
1	Plug: SS10A	**2**	Cord set rating: 10 A, 250 V
3	Connector: HS10S		

Figure 16: China CAB-250V-10A-CH



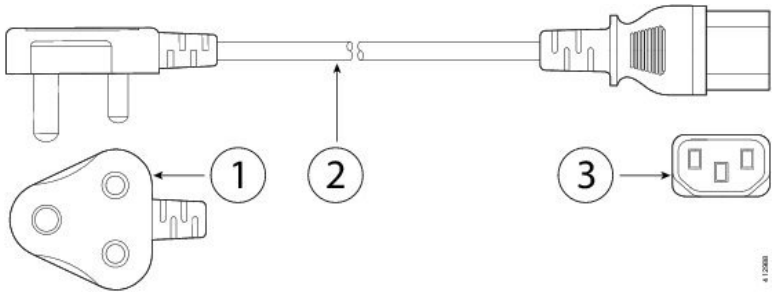
1	Plug: GB2099.1/2008	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C13		

Figure 17: Europe CAB-9K10A-EU



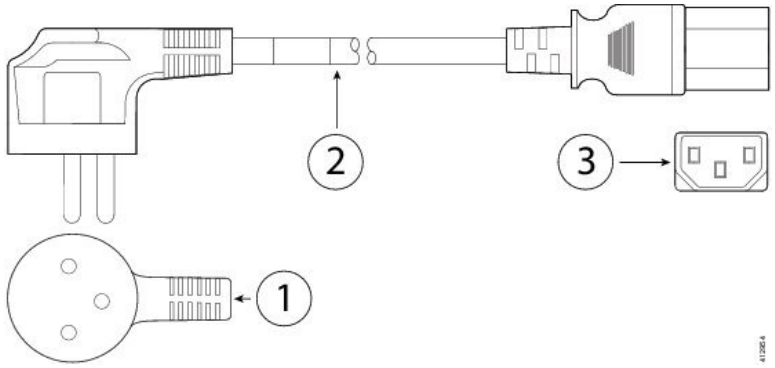
1	Plug: CEE 7/7 (M2511)	**2**	Cord set rating: 10 A/16 A, 250 V
3	Connector: IEC 60320/C15 (VSCC 15)		

Figure 18: India CAB-250V-10A-ID



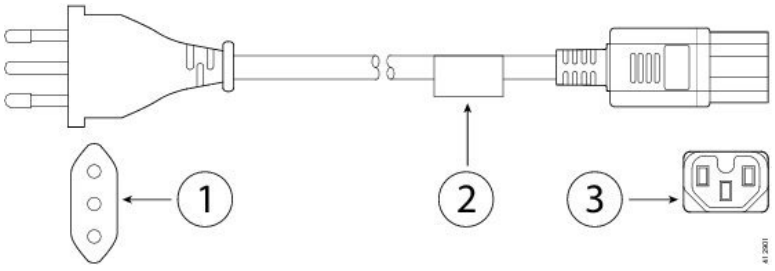
1	Plug: IS 6538-1971	**2**	Cord set rating: 16A, 250V
3	Connector: IEC 60320-C13		

Figure 19: Israel CAB-250V-10A-IS



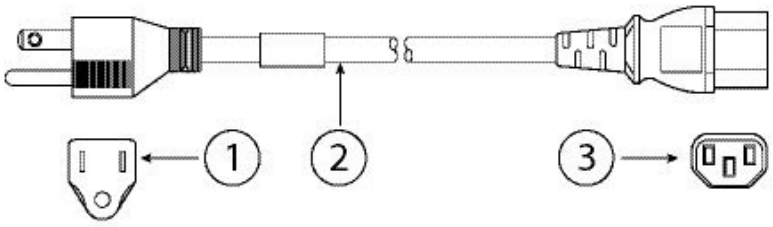
1	Plug: SI-32	**2**	Cord set rating: 10A, 250V
3	Connector: IEC 60320-C13		

Figure 20: Italy CAB-9K10A-IT



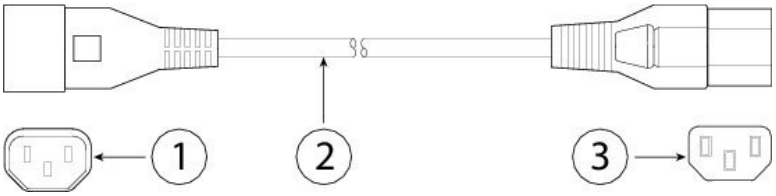
1	Plug: CEI 23-16/VII (I/3G)	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C15 (EN 60320/C15M)		

Figure 21: Japan CAB-JPN-3PIN



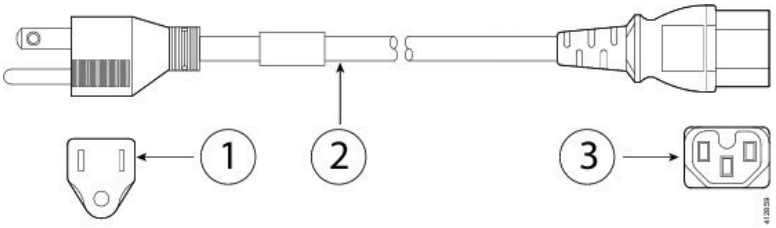
1	Plug: JIS 8303	**2**	Cord set rating: 12 A, 125 V
3	Connector: IEC 60320/C13		

Figure 22: Japan CAB-C13-C14-2M-JP



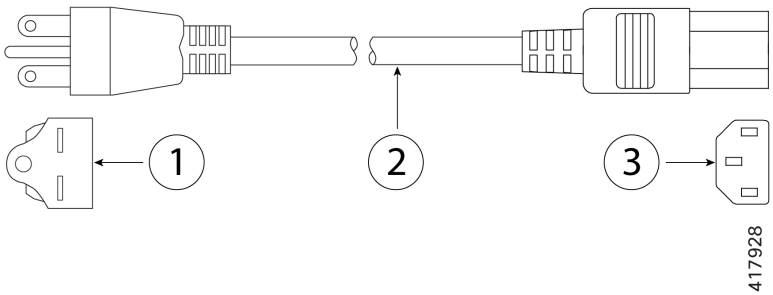
1	Plug: EN 60320-2-2/E	**2**	Cord set rating: 10 A, 250 V
3	Connector: EN 60320/C13		

Figure 23: North America CAB-9K12A-NA



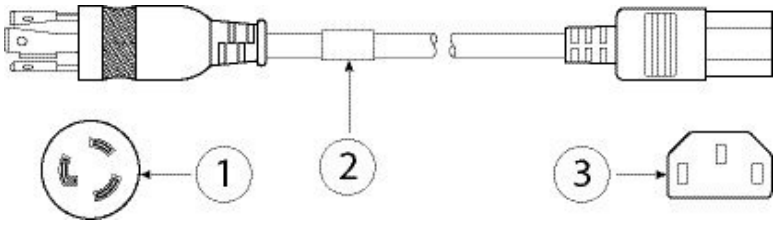
1	Plug: NEMA5-15P	**2**	Cord set rating: 13 A, 125 V
3	Connector: IEC 60320/C15		

Figure 24: North America CAB-N5K6A-NA



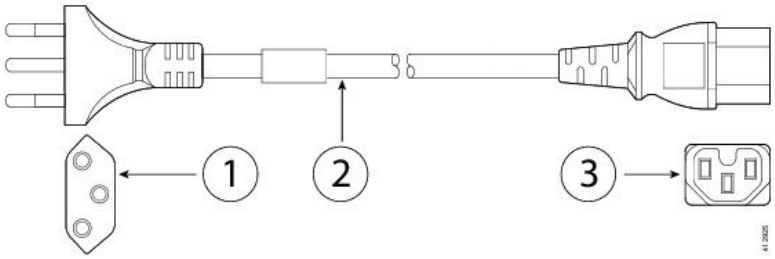
1	Plug: NEMA6-15P	**2**	Cord set rating: 10 A, 125 V
3	Connector: IEC 60320/C13		

Figure 25: North America CAB-AC-L620-C13



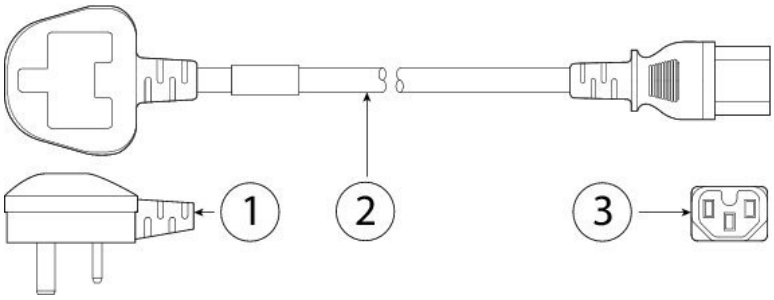
1	Plug: NEMA L6-20 (molded twist lock)	**2**	Cord set rating: 13 A, 250 V
3	Connector: IEC 60320/C13		

Figure 26: Switzerland CAB-9K10A-SW

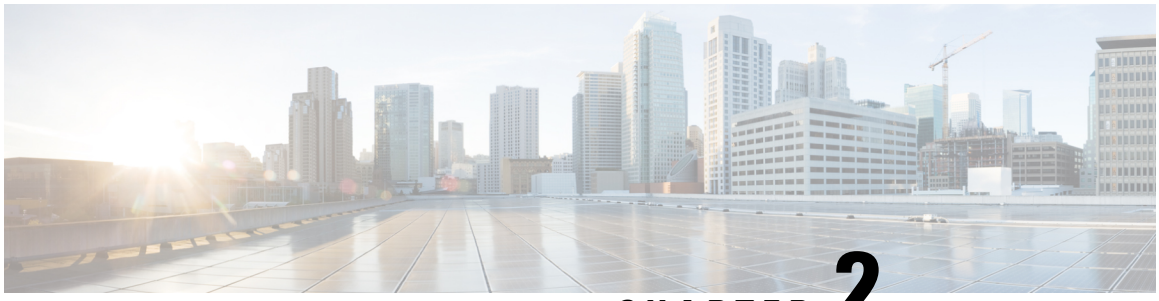


1	Plug: SEV 1011 (MP232-R)	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C15		

Figure 27: United Kingdom CAB-9K10A-UK



1	Plug: BS1363A/SS145	**2**	Cord set rating: 10 A, 250 V
3	Connector: IEC 60320/C15		



CHAPTER 2

Installation Preparation

Installation Warnings

Read the Regulatory and Compliance Safety Information document before installing the FMC chassis.

Take note of the following warnings:

Warning

Statement 1071—Warning Definition

IMPORTANT SAFETY INSTRUCTIONS

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

SAVE THESE INSTRUCTIONS

Warning

Statement 1005—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: USA: 120, 15 A (EU: 250V, 16A)

Warning **Statement 1004**—Installation Instructions

Read the installation instructions before using, installing or connecting the system to the power source.

Warning **Statement 12**—Power Supply Disconnection Warning

Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.

Warning **Statement 43**—Jewelry Removal Warning

Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

Warning **Statement 94**—Wrist Strap Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

Warning **Statement 1045**—Short-Circuit Protection

This product requires short-circuit (overcurrent) protection to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.

Warning **Statement 1021**—SELV Circuit

To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.

Warning **Statement 1024**—Ground Conductor

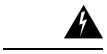
This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available.

Warning **Statement 1040—**Product Disposal

Ultimate disposal of this product should be handled according to all national laws and regulations.

Warning **Statement 1074—**Comply with Local and National Electrical Codes

Installation of the equipment must comply with local and national electrical codes.



Warning **Statement 19—**TN Power Warning

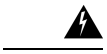
The device is designed to work with TN power systems.

Installation Guidelines

Take note of the following warnings.

Warning **Statement 1047—**Overheating Prevention

To prevent the system from overheating, do not operate it in an area that exceeds the maximum recommended ambient temperature of : 41 to 95°F (5 to 35°C)

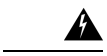


Warning **Statement 1019—**Main Disconnecting Device

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

Warning **Statement 1005—**Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: USA: 120, 15 A (EU: 250 V, 16 A)



Warning **Statement 1074—**Comply with Local and National Electrical Codes

Installation of the equipment must comply with local and national electrical codes.

Warning **Statement 371**—Power Cable and AC Adapter

When installing the product, please use the provided or designated connection cables/power cables/AC adaptors/batteries. Using any other cables/adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL-certified cables (that have the "UL" or "CSA" shown on the cord), not regulated with the subject law by showing "PSE" on the cord, for any other electrical devices than products designated by CISCO.

Warning **Statement 1073**—No User-Serviceable Parts

No user-serviceable parts inside. Do not open.

When you are installing an FMC chassis, use the following guidelines:

- Ensure that there is adequate space around the chassis to allow for servicing and for adequate airflow. The airflow in the chassis is from front to back.

  Caution To ensure proper airflow it is necessary to rack your chassis using rail kits. Physically placing the units on top of one another or stacking without the use of the rail kits blocks the air vents on top of the chassis, which could result in overheating, higher fan speeds, and higher power consumption. We recommend that you mount your chassis on rail kits when you are installing them into the rack because these rails provide the minimal spacing required between the chassis. No additional spacing between the chassis is required when you mount them using rail kits.

- Ensure that the air-conditioning can keep the chassis at a temperature of 41 to 95°F (5 to 35°C).
- Ensure that the cabinet or rack meets the rack requirements.
- Ensure that the site power meets the power requirements listed in Power Supply, on page 11. If available, you can use a UPS to protect against power failures.

  Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with these systems, which can have substantial current draw fluctuations from fluctuating data traffic patterns.

Safety Recommendations

The following information helps to ensure your safety and to protect the chassis. This information may not address all potentially hazardous situations in your working environment, so be alert and exercise good judgment at all times.

Observe these safety guidelines:

- Keep the area clear and dust free before, during, and after installation.
- Keep tools away from walkways, where you and others might trip over them.
- Do not wear loose clothing or jewelry, such as earrings, bracelets, or chains that could get caught in the chassis.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Never attempt to lift an object that is too heavy for one person.

Maintain Safety with Electricity

Warning Before working on a chassis, be sure the power cord is unplugged.

Read the Regulatory and Compliance Safety Information document before installing the FMC chassis.

Follow these guidelines when working on equipment powered by electricity:

- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected; always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Disconnect power from the system.
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim, and then call for help.
  - Determine whether the person needs rescue breathing or external cardiac compressions; then take appropriate action.
- Use the chassis within its marked electrical ratings and product usage instructions.
- The FMC chassis is equipped with an AC-input power supply, which is shipped with a three-wire electrical cord with a grounding-type plug that fits into a grounding-type power outlet only. Do not circumvent this safety feature. Equipment grounding should comply with local and national electrical codes.

Prevent ESD Damage

ESD occurs when electronic components are improperly handled, and it can damage equipment and impair electrical circuitry, which can result in intermittent or complete failure of your equipment.

Always follow ESD-prevention procedures when removing and replacing components. Ensure that the chassis is electrically connected to an earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the grounding clip to an unpainted surface of the chassis frame to safely ground ESD voltages. To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

For safety, periodically check the resistance value of the antistatic strap, which should be between one and 10 megohms.

Site Environment

See Hardware Specifications, on page 12 for information about physical specifications.

To avoid equipment failures and reduce the possibility of environmentally caused shutdowns, plan the site layout and equipment locations carefully. If you are currently experiencing shutdowns or unusually high error rates with your existing equipment, these considerations may help you isolate the cause of failures and prevent future problems.

Power Supply Considerations

See Power Supply, on page 11 for more detailed information about the power supply in the FMC chassis.

When installing the chassis, consider the following:

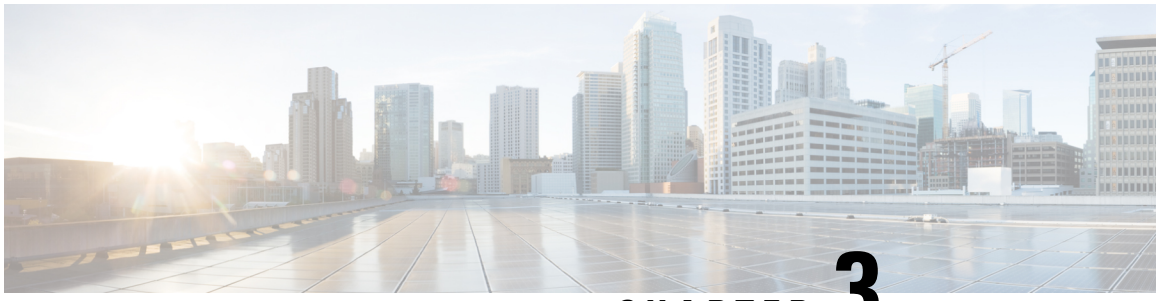
- Check the power at the site before installing the chassis to ensure that it is free of spikes and noise. Install a power conditioner, if necessary, to ensure proper voltages and power levels in the appliance-input voltage.
- Install proper grounding for the site to avoid damage from lightning and power surges.
- The chassis does not have a user-selectable operating range. Refer to the label on the chassis for the correct appliance input-power requirement.
- Several styles of AC-input power supply cords are available for the appliance; make sure that you have the correct style for your site.
- If you are using dual redundant (1+1) power supplies, we recommend that you use independent electrical circuits for each power supply.
- Install an uninterruptible power source for your site, if possible.

Rack Configuration Considerations

Consider the following when planning a rack configuration:

- If you are mounting a chassis in an open rack, make sure that the rack frame does not block the intake or exhaust ports.
- Be sure enclosed racks have adequate ventilation. Make sure that the rack is not overly congested as each chassis generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air.

- In an enclosed rack with a ventilation fan in the top, heat generated by equipment near the bottom of the rack can be drawn upward and into the intake ports of the equipment above it in the rack. Ensure that you provide adequate ventilation for equipment at the bottom of the rack.
- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack. Experiment with different arrangements to position the baffles effectively.



CHAPTER 3

Mount and Connect

Unpack and Inspect the Chassis

Tip Keep the shipping container in case the chassis requires shipping in the future.

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

See Package Contents, on page 3 for a list of what shipped with the chassis.

Step 1 Remove the chassis from its cardboard container and save all packaging material.

Step 2 Compare the shipment to the equipment list provided by your customer service representative. Verify that you have all items.

Step 3 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

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

Rack-Mount the Chassis

You can install the chassis in a rack using the Cisco rack kit.

The rack must be of the following type:

- A standard 19-in. (48.3-cm) wide, 4-post EIA rack with mounting posts that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992.
- The rack post holes can be square 0.38-in. (9.6 mm), round 0.28-in. (7.1 mm), #12-24 UNC, or #10-32 UNC when you use the supplied slide rails.
- The minimum vertical rack space for each chassis must be 1 RU, equal to 1.75 in. (44.45 mm).
- The slide rails for the chassis have an adjustment range of 24 to 36 in. (610 to 914 mm).

Note The slide rails supplied by Cisco Systems for the chassis do not require tools for installation if you install them in a rack that has square 0.38-in. (9.6 mm), round 0.28-in. (7.1 mm), or #12-24 UNC threaded holes.

Before you begin

Take note of the following warnings:

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

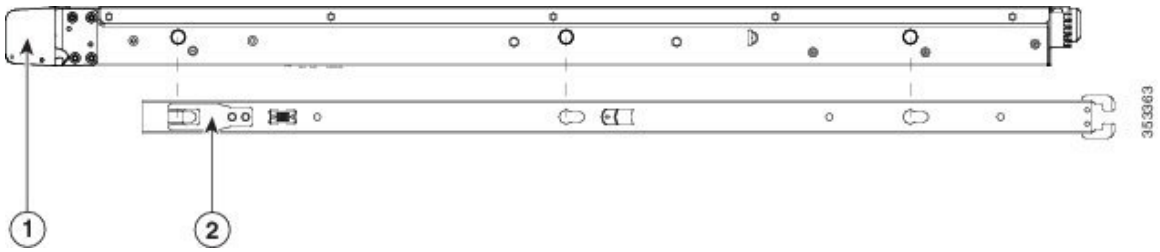
To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

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

Step 1 Attach the inner rails to the sides of the chassis:

a) Align an inner rail with one side of the chassis so that the three keyed slots in the rail align with the three pegs on the side of the chassis.
b) Set the keyed slots over the pegs, and then slide the rail toward the front to lock it in place on the pegs. The front slot has a metal clip that locks over the front peg.
c) Install the second inner rail to the opposite side of the chassis.

Figure 28: Attach the Inner Rail to Side of Server

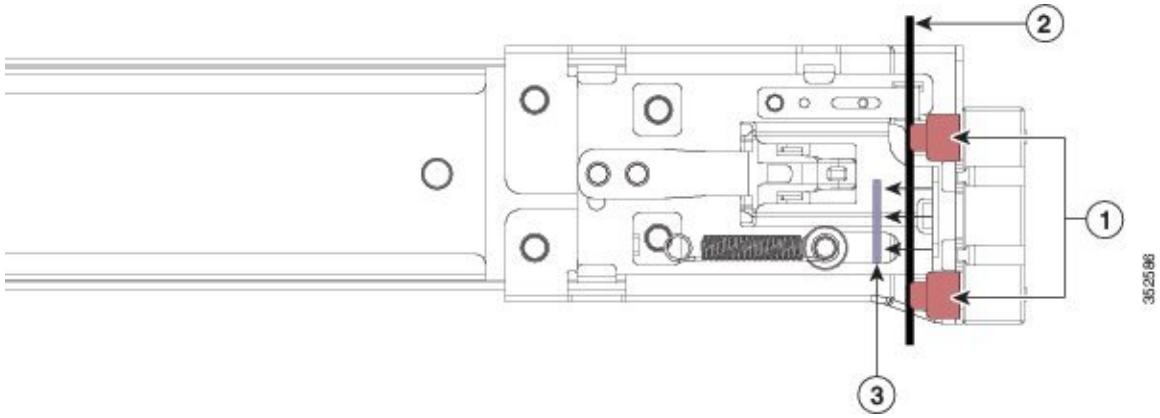


1	Front of chassis	**2**	Locking clip on inner rail

Step 2 Open the front securing plate on both slide-rail assemblies. The front end of the slide-rail assembly has a spring-loaded securing plate that must be open before you can insert the mounting pegs into the rack-post holes.

On the outside of the assembly, push the green arrow button toward the rear to open the securing plate.

Figure 29: Front Securing Mechanism, Inside of Front End



1	Front mounting pegs	**2**	Rack post
3	Securing plate shown pulled back to open position		

Step 3 Install the slide rails into the rack:

a) Align one slide-rail assembly front end with the front rack-post holes that you want to use.

The slide rail front end wraps around the outside of the rack post and the mounting pegs enter the rack-post holes from the outside-front.

Note The rack post must be between the mounting pegs and the open securing plate.

b) Push the mounting pegs into the rack-post holes from the outside-front.

c) Press the securing plate release button, marked “PUSH.” The spring-loaded securing plate closes to lock the pegs in place.

d) Attach the second slide-rail assembly to the opposite side of the rack. Make sure that the two slide-rail assemblies are at the same height with each other and are level front-to-back.

e) Pull the inner slide rails on each assembly out toward the rack front until they hit the internal stops and lock in place.

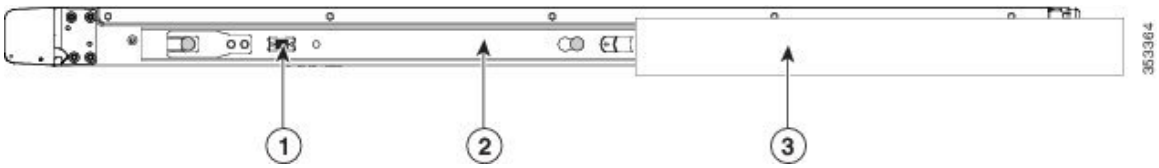
Step 4 Insert the chassis into the slide rails:

a) Align the rear of the inner rails that are attached to the chassis sides with the front ends of the empty slide rails on the rack.

b) Push the inner rails into the slide rails on the rack until they stop at the internal stops.

c) Slide the release clip toward the rear on both inner rails, and then continue pushing the chassis into the rack until its front slam latches engage with the rack posts

Figure 30: Inner Rail Release Clip



1	Inner rail release clip	**2**	Inner rail attached to appliance and inserted into outer rail
3	Outer rail attached to rack post		

Step 5 (Optional) Secure the chassis in the rack more permanently by using the two screws that are provided with the slide rails. Perform this step if you plan to move the rack with chassis installed. With the chassis fully pushed into the slide rails, open a hinged slam latch lever on the front of the chassis and insert the screw through the hole that is under the lever. The screw threads into the static part of the rail on the rack post and prevents the chassis from being pulled out. Repeat for the opposite slam latch.

What to do next

Connect Cables, Turn on Power, and Verify Connectivity, on page 32

Connect Cables, Turn on Power, and Verify Connectivity

This procedure references the rear panel ports of the FMC 2500 and 4500. The FMC 1000 is the same except that it does not have the two 10-G SFP+ ports above the Ethernet ports.

After rack mounting the chassis, follow these steps to connect cables, turn on power, and verify connectivity.

Note Although the CIMC is not supported on the FMC, you can use LOM on the default management interface (eth0) on a SOL connection to remotely monitor or manage the FMC system. For information about using LOM and SOL, see the Firepower Management Center Getting Started Guide for your model.

Before you begin

Take note of the following warnings.

Warning **Statement 1009**—Laser Radiation

Laser radiation is present when the system is open.

Warning **Statement 1014**—Laser Radiation

Laser radiation is present when the system is open and interlocks bypassed.

Warning **Statement 1051**—Laser Radiation

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

Warning **Statement 1053**—Class 1M Laser Radiation

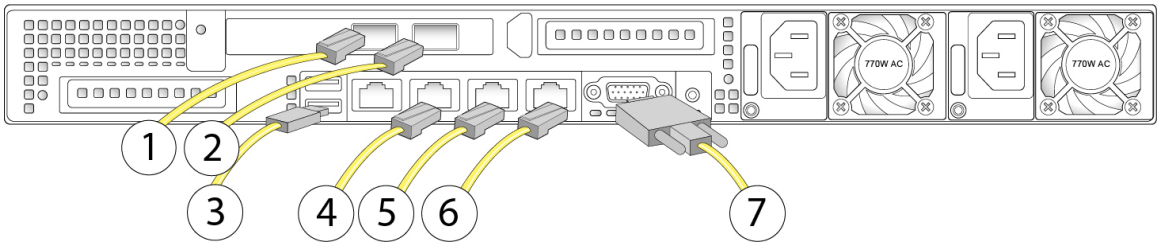
Class 1M laser radiation when open. Do not view directly with optical instruments.

Note AC power supplies have internal grounding and so no additional chassis grounding is required when the supported AC power cords are used. For more information about supported power cords, see Power Cord Specifications, on page 13.

Step 1 (Optional) VGA port and USB port—Connect a monitor to the VGA port and a keyboard to the USB port to complete initial setup at the CLI. You can alternatively complete initial setup using HTTPS on eth0 (see Step 2).

Note The serial console port is not enabled for initial setup.

Figure 31: Cable Connections



1	eth2 management interface 10-Gigabit Ethernet SFP+ support Use only Cisco-supported SFPs.	**2**	eth3 management interface 10-Gigabit Ethernet SFP+ support Use only Cisco-supported SFPs.

3	USB keyboard port	**4**	Serial console port Use the console cable (RJ45 to DB9) to connect a computer to the appliance. This port is disabled by default.
5	eth0 management interface (labeled "1") Gigabit Ethernet 10/100/1000 Mbps interface, RJ-45 eth0 is the default management interface.	**6**	eth1 management interface (labeled "2") Gigabit Ethernet 10/100/1000 Mbps interface, RJ-45
7	VGA port		

Step 2 eth0 management interface (labeled "1")—Use this interface to perform initial setup using HTTPS, to perform routine management, and to manage devices from the FMC chassis. Using an Ethernet cable, connect the eth0 interface to your default management network reachable from your management PC. This interface is the default management interface and is enabled by default.

Note You must perform initial setup to change the eth0 IP address to match your network. You can use the VGA/keyboard CLI for initial setup to set the eth0 IP address, or you can connect your computer directly to eth0, change the address using the HTTPS initial setup, and then connect eth0 to your network.

Step 3 (Optional) eth1 management interface (labeled "6")—Connect this management interface to the same or different network from your other management interfaces depending on your network needs. For information about management interfaces and network topology, see the Firepower Management Center Configuration Guide.

Step 4 eth2 and eth3 management interfaces—If your model includes 10-Gigabit Ethernet SFP+ interfaces, install any Cisco-supported SFP+ transceivers and cables as needed. You can connect these interfaces to the same or different network from your other management interfaces depending on your network needs. For more information about management interfaces and network topology, see the Firepower Management Center Configuration Guide.

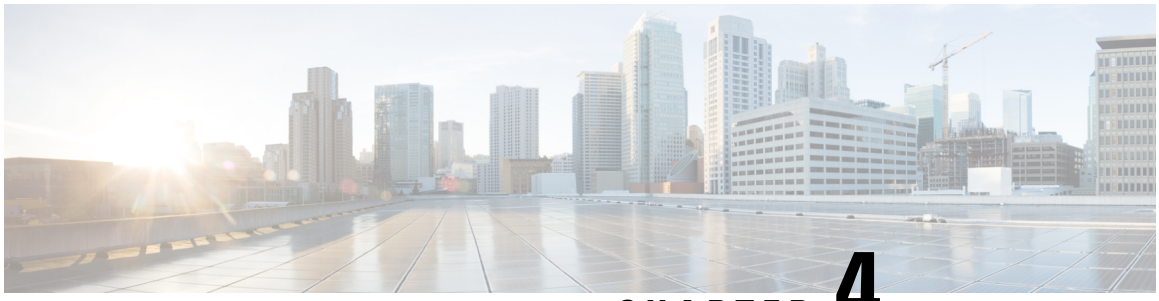
Each Cisco-certified SFP+ transceiver (FS2K-NIC-SFP/FS4K-NIC-SFP) has an internal serial EEPROM that is encoded with security information. This encoding allows us to identify and validate that the SFP transceiver meets the requirements for the FMC chassis.

Note Only Cisco certified SFP+ transceivers are compatible with the 10-G interfaces. Cisco TAC may refuse support for any interoperability problems that result from using an untested third-party SFP transceiver.

Step 5 Power—Use one of the supported power cords to connect the power supplies of the chassis to your power source. For more information about supported power cords, see Power Cord Specifications, on page 13.

Step 6 Verify—Press the Power button on the front of the chassis, and verify that the power status LED is on.

Step 7 Setup and configuration—See the Cisco Firepower Management Center Getting Started Guide for Models 1000, 2500, and 4500 to continue setup and configuration.



CHAPTER 4

Maintenance and Upgrades

Graceful Shut Down

The appliance can run in two power modes:

- Main power mode—Power is supplied to all appliance components and the operating system.
- Standby power mode—Power is supplied only to the service processor and the cooling fans. It is safe to power off the appliance from this mode.

Before you begin

You can gracefully shut down the appliance by using the **shutdown** command or the Power button on the appliance front panel.

Step 1 Check the color of the Power Status LED (see Front Panel, on page 4).

- Amber—The appliance is already in standby mode and can be safely powered off. Go to Step 3.
- Green—The appliance is in main power mode and must be shut down before it can be safely powered off. Go to Step 2.

Step 2 Use one the following methods to shut down the appliance. If possible, invoke a graceful shutdown. Otherwise invoke a hard shutdown:

Caution To avoid data loss or damage to your operating system, you should always invoke a graceful shutdown of the operating system.

- Graceful shutdown using the CLI—Enter the **shutdown** command. The operating system performs a graceful shutdown and the appliance goes to standby mode, which is indicated by an amber Power Status LED.
- Graceful shutdown using the front panel—Press and release the Power button. The operating system performs a graceful shutdown and the appliance goes to standby mode, which is indicated by an amber Power Status LED.

- Emergency shutdown—Press and hold the Power button for four seconds to force the main power off and immediately enter standby mode.

Step 3 Disconnect the power cords from the power supplies in your appliance to completely power off the appliance.

Replace Components Guidelines

Warning **Statement 1029**—Blank Faceplates and Cover Panels

Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place.

Caution When handling appliance components, wear an ESD strap to avoid damage.

Tip You can press the Unit Identification button on the front panel or rear panel to turn on a flashing Unit Identification LED on the front and rear panels of the chassis. This button allows you to locate the specific chassis that you are servicing when you go to the opposite side of the rack. For locations of these LEDs, see Front Panel, on page 4.

Remove and Replace the Power Supply

The two power supplies included with your chassis are redundant and hot-swappable. One is the active power supply and the other is the standby power supply (1+1).

This chassis also supports cold redundancy. Depending on the power being drawn by the chassis, one power supply might actively provide all power to the system while the remaining power supply is put into a standby state. For example, if the power consumption can be satisfied by power supply 1, then power supply 2 is put into a standby state.

Caution When you replace power supplies, do not mix power supply types in the appliance. Both power supplies must be the same wattage and Cisco PID.

Before you begin

Take note of the following warnings:

Warning **Statement 1018—**Supply Circuit

Take care when connecting units to the supply circuit so that wiring is not overloaded.

Warning **Statement 1019—**Main Disconnecting Device

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

Warning **Statement 1024—**Ground Conductor

This equipment must be grounded. 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 1030—**Equipment Installation

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Warning **Statement 1030—**Equipment Installation

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Warning **Statement 1073—**No User-Serviceable Parts

No user-serviceable parts inside. Do not open.

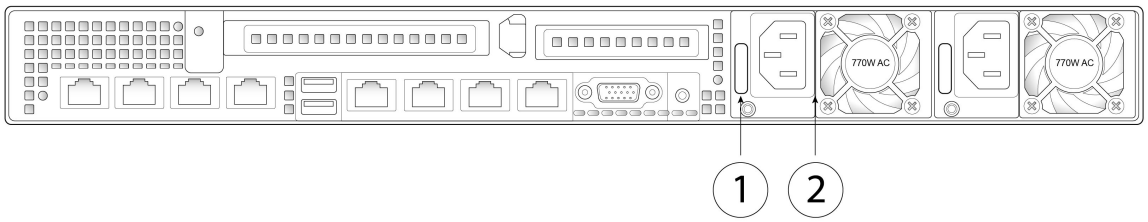
Warning **Statement 1074—**Comply with Local and National Electrical Codes

Installation of the equipment must comply with local and national electrical codes.

Step 1 Remove the power supply that you are replacing:

a) Remove the power cord from the power supply.
b) Grasp the power supply handle while pinching the green release lever towards the handle.
c) Pull the power supply out of the bay.

Figure 32: Remove and Replace the Power Supply



1	Power supply handle	**2**	Power supply release lever

Step 2 Install a new power supply:

a) Grasp the power supply handle and insert the new power supply into the empty bay.
b) Push the power supply into the bay until the release lever locks.
c) Connect the power cord to the new power supply.
d) If you shut down the chassis, press the Power button to return the chassis to main power mode.

Remove and Replace the Drive

Tip We recommend that you shut down or power off the chassis to replace the drives even though they are hot-swappable. If you do not turn power off while replacing the drive, you should restart the chassis afterward.

Note You cannot add more drives to your FMC. You can only replace the drives in the slots that are supported for your model.

Before you begin

Take note of the following warnings:

Warning **Statement 1018—**Supply Circuit

Take care when connecting units to the supply circuit so that wiring is not overloaded.

Warning **Statement 1019—**Main Disconnecting Device

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

Warning **Statement 1024—**Ground Conductor

This equipment must be grounded. 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 1030—**Equipment Installation

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

Warning **Statement 1073—**No User-Serviceable Parts

No user-serviceable parts inside. Do not open.

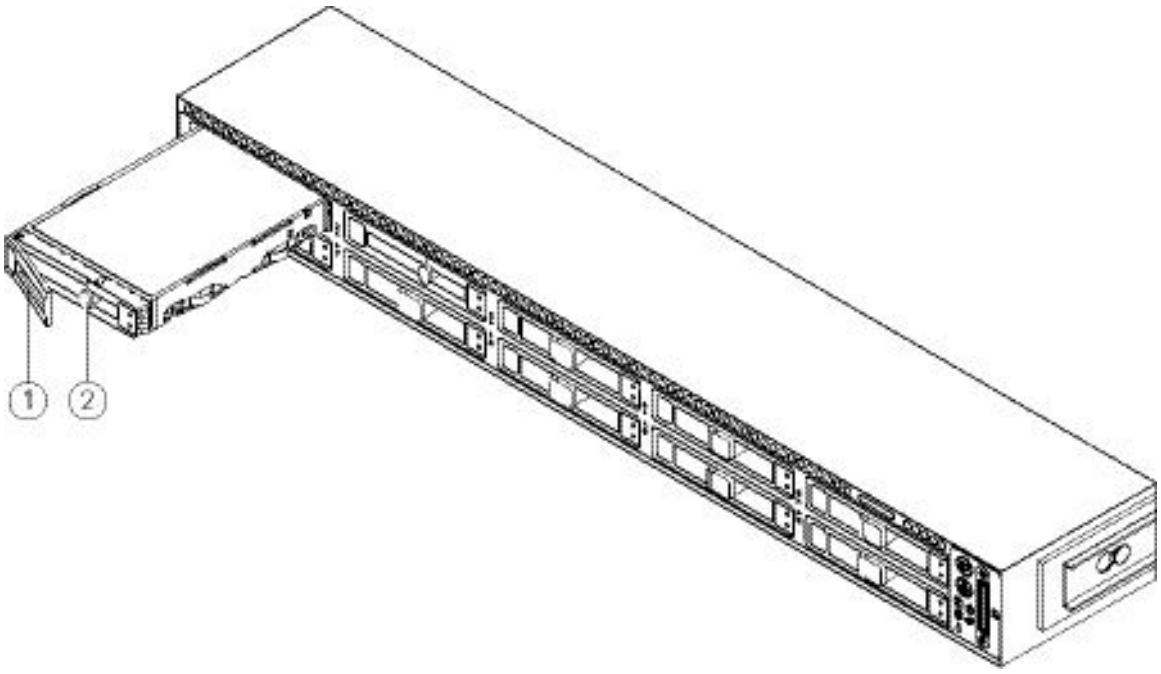
Warning **Statement 1074—**Comply with Local and National Electrical Codes

Installation of the equipment must comply with local and national electrical codes.

Step 1 Remove the drive that you are replacing:

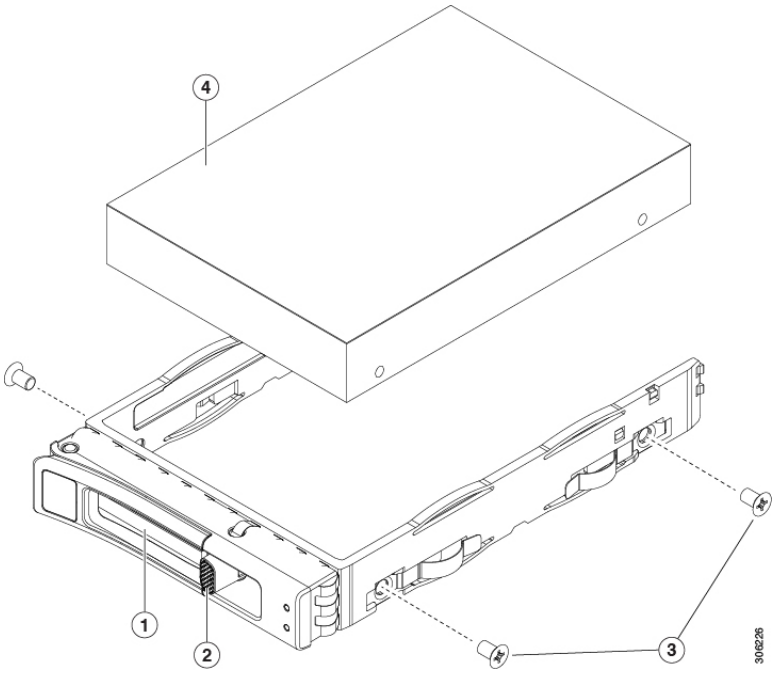
a) Press the release button on the face of the drive tray.
b) Grasp and open the ejector lever and then pull the drive tray out of the slot.

Figure 33: Remove the Drive



Step 2 Remove the four drive-tray screws that secure the drive to the tray and then lift the drive out of the tray.

Figure 34: Remove the Drive Tray



1	Ejector lever	**2**	Release button
3	drive tray screws (two on each side)	4	Drive removed from drive tray

Step 3 Install a new drive:

a) Make sure that the new drive is safely secured by the four drive-tray screws.
b) With the ejector lever on the drive tray open, insert the drive tray into the empty drive bay.
c) Push the tray into the slot until it touches the backplane, and then close the ejector lever to lock the drive in place.