

Hardware Installation Guide for Cisco Catalyst 8200 Series Edge Platforms

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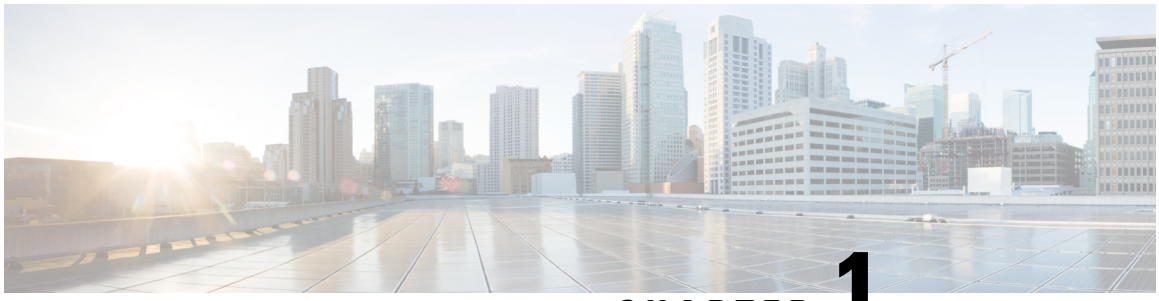
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CHAPTER 1

Overview

The Cisco Catalyst 8200 Series Edge Platforms are best-of-breed, 5G-ready, cloud edge platforms designed for accelerated services, multi-layer security, cloud-native agility, and edge intelligence to accelerate your journey to cloud.

Cisco Catalyst 8200 Series Edge Platforms with Cisco IOS XE SD-WAN Software deliver Cisco's secure, cloud-scale SD-WAN solution for the branch. The Cisco Catalyst 8200 Series Edge Platforms is built for high performance and integrated SD-WAN Services along with flexibility to deliver security and networking services together from the cloud or on premises. It provides higher WAN port density and a redundant power supply capability. The Cisco Catalyst 8200 Series Edge Platforms have a wide variety of interface options to choose from—ranging from lower and higher module density with backward compatibility to a variety of existing WAN, LTE, voice, and compute modules. Powered by Cisco IOS XE, fully programmable software architecture, and API support, these platforms can facilitate automation at scale to achieve zero-touch IT capability while migrating workloads to the cloud. The Cisco Catalyst 8200 Series Edge Platforms also come with Trustworthy Solutions 2.0 infrastructure that secures the platforms against threats and vulnerabilities with integrity verification and remediation of threats.

The Cisco Catalyst 8200 Series Edge Platforms are well suited for medium-sized and large enterprise branch offices for high WAN IPSec performance with integrated SD-WAN services.

Cisco Catalyst 8200 Series Edge Platforms target these use cases:

- Enterprise Branch office, Managed Service Provide CPE, Internet Gateway for DIA, SASE cloud platform with SD-WAN
- Next-generation of Software Defined (SD) Branch routing platforms

For more information on the features and specifications, refer to the Cisco Catalyst 8200 Series Edge Platforms datasheet.

Note Sections in this documentation apply to all models of Cisco Catalyst 8200 Series Edge Platforms unless a reference to a specific model is made explicitly.

This chapter contains the following sections:

- Chassis Views, on page 2
- Location of labels, on page 4
- Locate Product Identification Details, on page 4
- Hardware Features of Cisco Catalyst 8200 Series Edge Platforms, on page 5

Chassis Views

This section contains views of the Power-input and I/O sides of the Cisco Catalyst 8200 Series Edge Platforms, showing the locations of power and signal interfaces, module slots, status indicators, and chassis identification labels:

Cisco Catalyst 8200 Series Edge Platforms are available in these models:

- C8200-1N-4T
- C8200L-1N-4T

Note N=Network Interface Modue, and T=Gigabit Ethernet

Power-input and I/O sides

Figure 1: Cisco 8200 Series Chassis - I/O Side

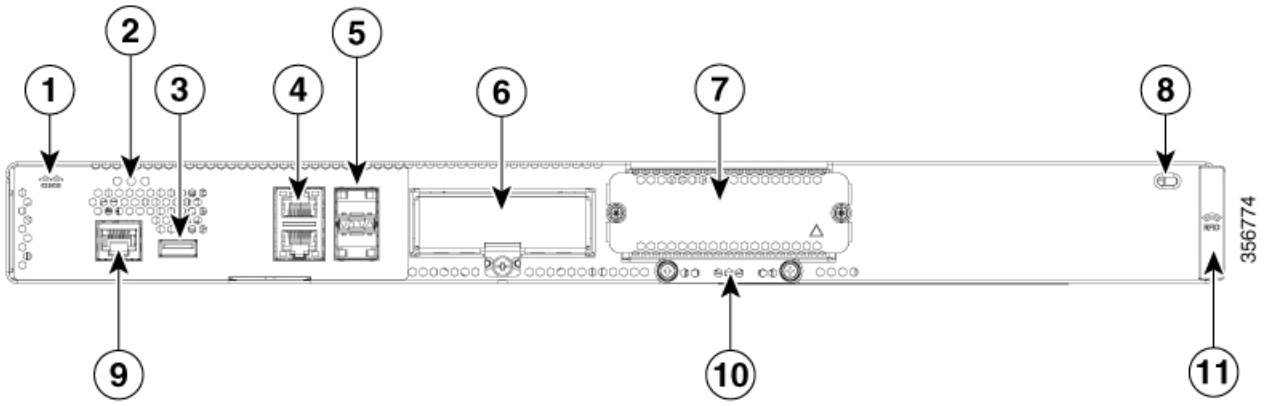


Table 1: I/O Side

1	Logo	2	Status LEDs
3	USB	4	RJ-45 ports GE0/0/0-0/0/1
5	Gigabit Ethernet ports GE0/0/2 - 0/0/3 (SFP)	6	LTE module (PIM)
7	NIM Module	8	Kensington lock
9	RJ-45 Console	10	M.2 USB/NVMe storage
11	RFID (Provisionable)		

Figure 2: Cisco 8200 Series Chassis - Power-input Side

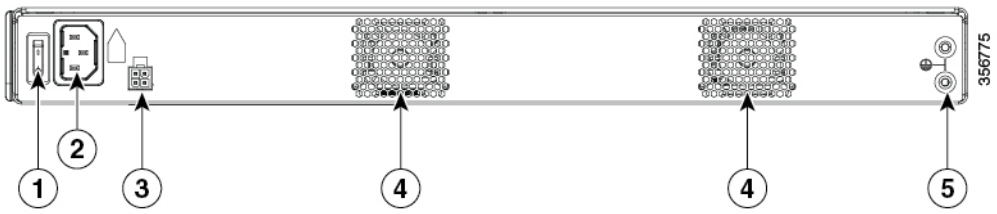


Table 2: Power-input Side

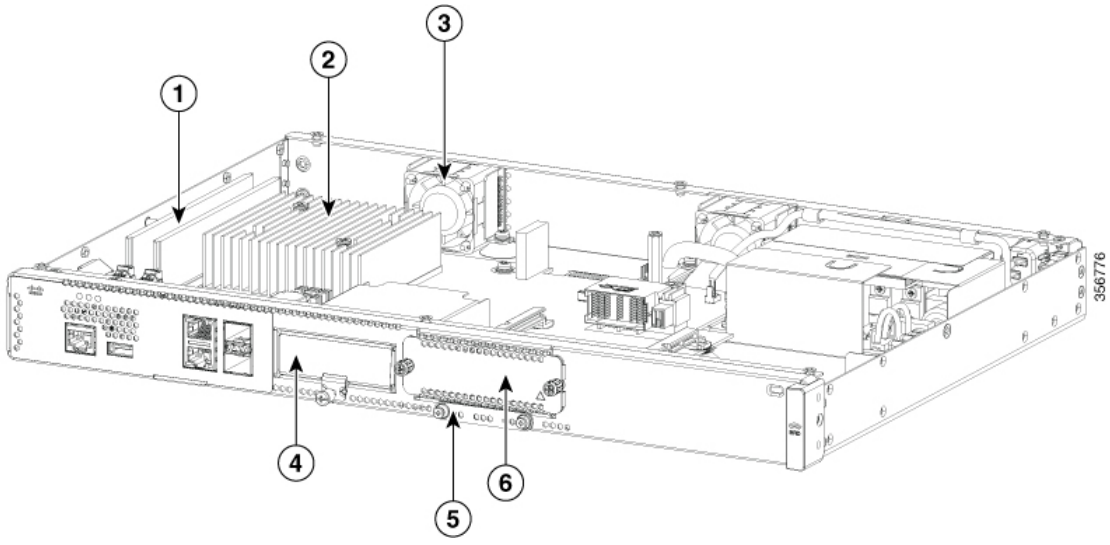
1	Switch	2	AC power socket
3	PoE Adapter	4	Fan
5	Ground lug securing location		

For detailed information on LEDs, see the section on LED indicators.

Platform Summary

The figure below shows the internal view of Cisco Catalyst 8200 Series Edge Platforms with components and module locations.

Figure 3: Platform Summary of Cisco 8200 Series Edge Platforms



1	DIMMs	2	CPU
3	Fan	4	PIM slot

5	M.2 card slot	6	NIM slot

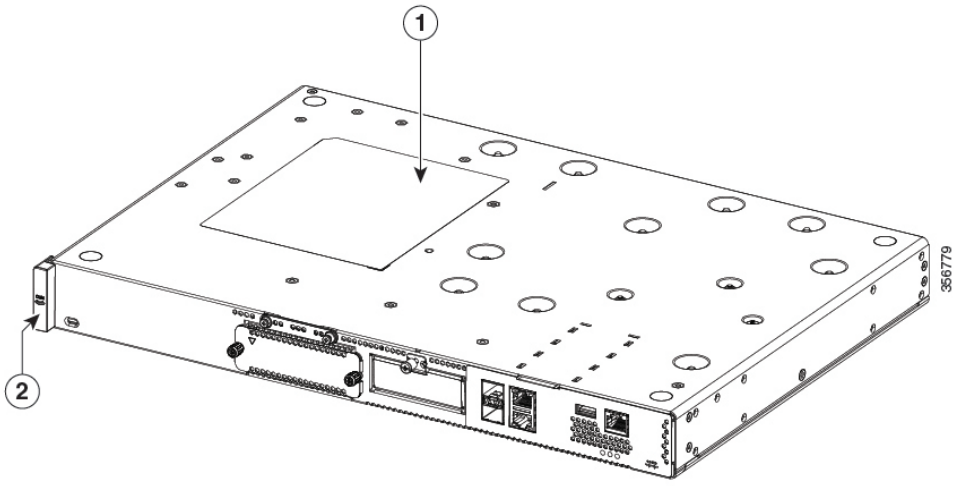
Location of labels

The figure below shows the location of the labels on the Cisco Catalyst 8200 Series Edge Platforms. Labels are located at the same location on all the Cisco Catalyst 8200 Series Edge Platforms.

The Serial number (SN), Common language equipment identifier (CLEI), Top Assembly Number (TAN), Product ID (PID), PID version ID (VID), and Quick response (QR) code are printed on a label on the back of the platform or on a label tray located on the chassis.

Note The RFID tags on the devices are pre-fitted and does not come with spare RFID tags.

Figure 4: Label Location on a Cisco 8200 Series Edge Platforms



1	Compliance label	2	RFID

Locate Product Identification Details

Software License

The serial number (SN), product ID (PID), version ID (VID), and Common Language Equipment Identifier (CLEI) are printed on a label on the bottom of the device or on the label tray.

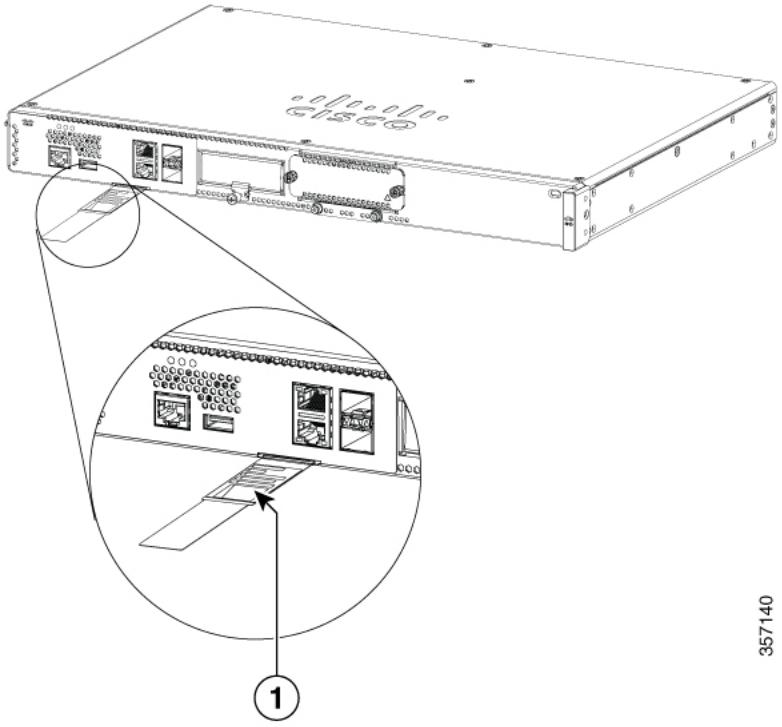
To obtain a software license, you need the unique device identifier (UDI) of the device where the license is to be installed.

The UDI has two main components:

- Product ID (PID)

- Serial number (SN)

The UDI can be viewed using the **show license udi** command in privileged Exec mode in Cisco Internet Operating System (IOS) software.



1	Label tray

Hardware Features of Cisco Catalyst 8200 Series Edge Platforms

This section describes the hardware features of Cisco Catalyst 8200 Series Edge Platforms.

Built-In Interface Ports

The Cisco Catalyst 8200 Series Edge Platforms have multiple 10/100/1000 front panel ports and Small Form Pluggables.

GE or SFP Ports

The following GE and SFP ports are available on the Cisco Catalyst 8200 Series Edge Platforms:

GE Ports

The GE RJ-45 copper interface ports support 10BASE-T, 100BASE-TX, and 1000BASE-T.

SFP Ports

The small-form-factor pluggable (SFP) ports support 1Gbps SFP modules.

Removable and Interchangeable Modules and Cards

Network Interface Modules (NIMs), Pluggable Interface Modules (PIMs) and M.2 USB/NVMe storage fit into external slots and can be removed or replaced without opening the chassis.

External Slots

- Network Interface Modules (NIMs)
- Pluggable Interface Modules (PIMs)
- M.2 USB/NVMe storage



Note The LTE Pluggable Interface Module interfaces with the host CPU through the USB3.0 interface. The host then accesses the LTE related signals through the I2C interface of the pluggable module.

Internal Slots

- Memory

See the Cisco Catalyst 8200 Series Edge Platforms product page on cisco.com for a list of supported modules and interface cards.

Memory

Cisco Catalyst 8200 Series Edge Platforms contain DIMMs that store running configuration and routing tables, and are used for packet buffering by the network interfaces.

- Boot/NVRAM—Stores the bootstrap program (ROM monitor) and the configuration register. The boot/NVRAM is not serviceable.
- Internal memory—Internal bootflash memory
- Removable M.2 card—Available in 16GB (default), 32GB M.2 USB, 600GB M.2 NVMe SSD and 2TB M.2 NVMe.
- DRAM options
  - 1x 8GB DDR4 (default)
  - 1x 16GB DDR4 (upgrade)
  - 1x 32GB DDR4 (upgrade)

Note Although Cisco Catalyst 8200Ls in controller mode support the 4GB memory configuration, Cisco recommends using 8GB of memory for feature-rich and high-scale environments to prevent high memory utilization issues.

Power Supply

The Cisco Catalyst 8200 Series Edge Platforms have an internal Power supply. The appropriate AC-cord is provided with the product to connect to the AC power socket. Optional PoE is available with a PoE adapter. Refer the Figure 2 for the power connection locations (AC power socket and PoE adapter).

LEDs for Cisco Catalyst 8200 Series Edge Platforms

Figure 5: Front (I/O) Side LED Status Indicators

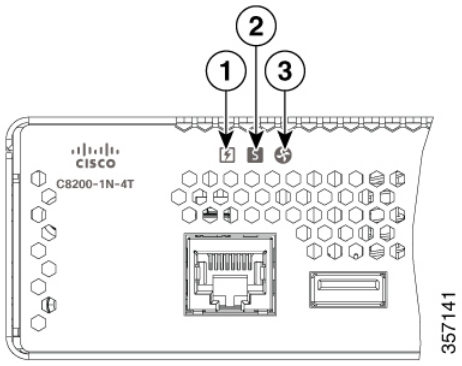


Table 3: LEDs Indicators

LED	Color	Description
1 PSU	Green/Amber	**Power Supply Status** Off: The system is powered off Green: All installed PSUs are operating correctly
2 STATUS	Green/Amber/Red	**System Status** Red: The system is booting Red Blinking Red: The system has failed a hardware integrity error Yellow: Rommon has completed booting and system at Rommon prompt or booting platform software. Green: Normal System Operation

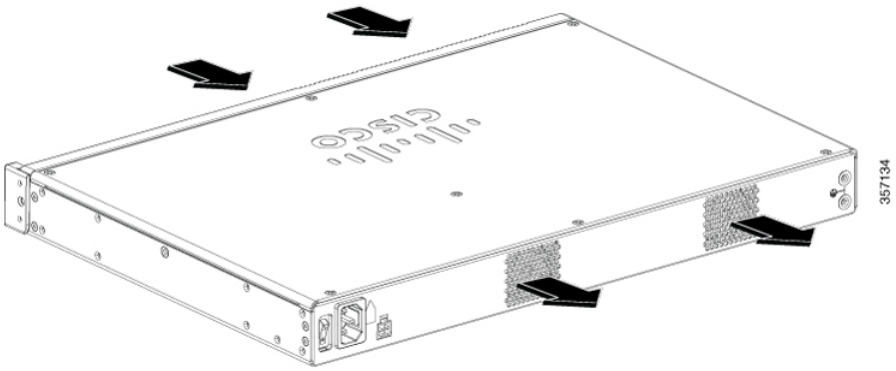
LED	Color	Description
3 ENV	Green/Amber/Red	**Environmental Status** Off: Monitor is not active. Red: The system has detected a critical overcurrent event and may shut down. Blinking Yellow: One or more temperature sensors in the system are outside the acceptable range. Yellow: One or more fans in the system are outside the acceptable range. Green: All temperature sensors and fans in the system are within acceptable range.
LINK	Green	**RJ-45 Management Ethernet Link LED** Off: No link Green: Ethernet cable present and link established with other side
SPEED	Green	**RJ-45 Management Ethernet Speed LED** Off: No Link Blinking Green: blink frequency indicates port speed: 1 blink – 10Mbps link speed 2 blinks – 100Mbps link speed 3 blinks – 1000Mbps link speed
SFP EN	Green	**SFP Enable LED** Off: Not present Green: The SFP is supported and no faults. Amber: The SFP is not supported or is in a faulty state
SFP LINK	Green	**SFPs Link LED** Off: No Link (or not present) Green: Link established

Fans, Ventilation, and Airflow

Chassis Ventilation

The chassis temperature is regulated with internal fans. An onboard temperature sensor and pressure sensor control the fans speed. The fans are always on when the device is powered on. Under all conditions, the fans operate at the slowest speed possible to conserve power and reduce noise. When necessary, the fans operate at higher speeds under conditions of higher ambient temperature and altitude.

Figure 6: Airflow of C8200 Series Edge Platforms



Slots, Subslots-Bay, Ports, and Interfaces

The Cisco Catalyst 8200 Series Edge Platforms support interface modules: Network Modules (NIMs) and Pluggable Interface Modules (PIMs).

In all cases, the device designates its interfaces using a 3-tuple notation that lists the slot, bay, and port. The 3-tuple value is zero based. An example of a 3-tuple is 0/1/2. This refers to slot 0, the second bay in slot 0 (the first bay is 0 so the second bay is 1), and the third port in bay 1. See the following table for more examples.

Table 4: Slot, Subslot-Bay and Port Numbering

3-Tuple Example	Slot	Bay	Port
0/1/2	0	2nd	3rd
0/0/1	0	1st	2nd
1/1/1	1	2nd	2nd

- Slots and bays are numbered from the left to the right, and from the top to the bottom.
- There is one USB port-USB0. They do not have slot or bay numbers.

Note USB0 can be used to insert flash drives.

Slot Numbering

Slots are numbered 0, 1, and 2.

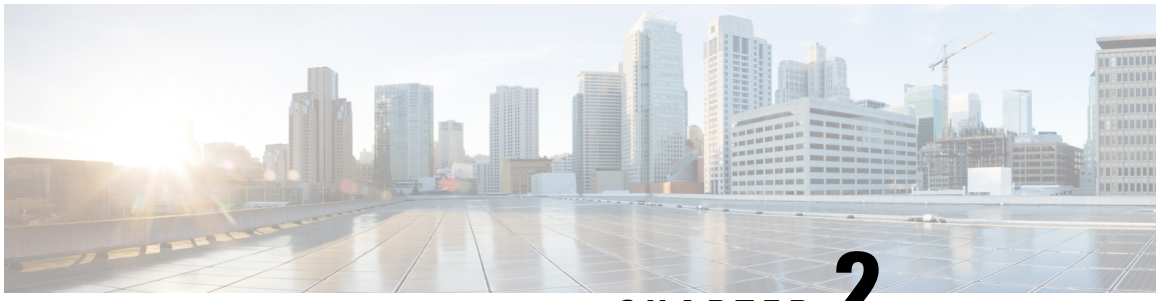
About Slot 0

The following are the main features of Slot 0:

- Slot 0 is reserved for integrated ports and NIMs.

Subslot and Bay Numbering

- Integrated devices, also known as integrated ports or FPGEs, and NIMs reside in a fixed section of bay 0.
- Motherboard NIMs bays start at bay 1 because the integrated devices and integrated NIMs take up bay 0.



CHAPTER 2

Prepare for Installation

This chapter provides preinstallation information, such as recommendations and requirements that must be met before installing your platform. Before you begin, inspect all items for shipping damage. If anything appears to be damaged or if you encounter problems installing or configuring your platform, contact customer service.

- Standard Warning Statements, on page 11
- Safety Recommendations, on page 15
- General Site Requirements, on page 17
- Rack Requirements, on page 19
- Power Guidelines and Requirements, on page 19
- Network Cabling Specifications, on page 19
- Required Tools and Equipment for Installation and Maintenance, on page 20

Standard Warning Statements

This section describes the warning definition and then lists core safety warnings grouped by topic.



Warning

Statement 1071—Warning Definition

IMPORTANT SAFETY INSTRUCTIONS

Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Read the installation instructions before using, installing, or connecting the system to the power source. Use the statement number at the beginning of each warning statement to locate its translation in the translated safety warnings for this device.

SAVE THESE INSTRUCTIONS



General Safety Warnings



Warning **Statement 445—**Connect the Chassis to Earth Ground

To reduce the risk of electric shock, connect the chassis of this equipment to permanent earth ground during normal use.



Warning **Statement 1005**—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than: 20A.



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

This product is a Class 1 laser product.



Warning **Statement 1017—**Restricted Area

This unit is intended for installation in restricted access areas. Only skilled, instructed, or qualified personnel can access a restricted access area.



Warning **Statement 1022—**Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.

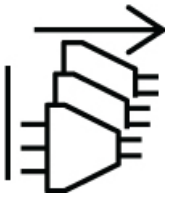


Warning **Statement 1024—**Ground Conductor

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 1028—**More Than One Power Supply

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.



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

Blank faceplates and cover panels serve three important functions: they reduce the risk of electric shock and fire, 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.

Warning **Statement 1032—**Lifting the Chassis

To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules, such as power supplies, fans, or cards. These types of handles are not designed to support the weight of the unit.

Warning **Statement 1035—**Proximity to Water

Do not use this product near water, for example, near a bathtub, wash bowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.

Warning **Statement 1038—**Telephone Use During an Electrical Storm

Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a risk of electric shock from lightning.

Warning **Statement 1039—**Telephone Use by Gas Leak

To reduce the risk of ignition, do not use a telephone in the vicinity of a gas leak.

Warning **Statement 1041—**Disconnect Telephone Network Cables

Before opening the unit, disconnect the telephone network cables to avoid contact with telephone network voltages.

Warning **Statement 1055—**Class 1/1M Laser

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



Warning **Statement 1056—**Unterminated Fiber Cable

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

There are no serviceable parts inside. To avoid risk of electric shock, do not open.

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

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes.

Warning **Statement 1086—**Replace Cover on Power Terminals

Hazardous voltage or energy may be present on power terminals. To reduce the risk of electric shock, make sure the power terminal cover is in place when the power terminal is not being serviced. Be sure uninsulated conductors are not accessible when the cover is in place.

Note **Statement 1089—**Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.

Warning **Statement 1090—**Installation by a Skilled Person

Only a skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of a skilled person.

Warning **Statement 1091—**Installation by an Instructed Person or Skilled Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed person or skilled person.

Warning **Statement 1100—**Before Making Telecommunication Network Connection

High touch/leakage current—Permanently connected protective earth ground is essential before connecting to the telecommunication network.

Warning **Statement 9001—**Product Disposal

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

Safety Recommendations

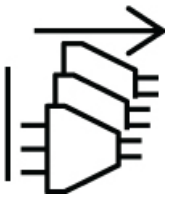
Follow these guidelines to ensure general safety:

- Never attempt to lift an object that might be too heavy for you to lift by yourself.
- Keep the chassis area clear and dust-free during and after installation.
- If you remove the chassis cover, place it in a safe place.
- Keep tools and chassis components away from walk areas.
- Do not wear loose clothing that may get caught in the chassis. Fasten any tie or scarf and roll up sleeves.
- Wear safety glasses when working under conditions that might be hazardous to your eyes.
- Do not perform any action that may create a hazard to people or makes equipment unsafe.

Safety with Electricity

Warning **Statement 1028—**More Than One Power Supply

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.



Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-off switch in the room in which you are working. If an electrical accident occurs, you can quickly turn off the power.
- Disconnect all power before doing the following:
  - Installing or removing a chassis
  - Working near power supplies
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, frayed power cords, and missing safety grounds.
- Do not work alone if hazardous conditions exist
- Never assume that power is disconnected from a circuit. Always check
- Never open the enclosure of the internal power supply
- If an electrical accident occurs to another person, proceed as follows:
  - Use caution; do not become a victim yourself
  - Turn off power to the device
  - If possible, send another person to get medical aid. Otherwise, assess the condition of the victim and then call for help
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action

In addition, use the following guidelines when working with any equipment that is disconnected from a power source but has telephone wiring or other network cabling connections:

- Never install telephone wiring during a lightning storm
- Never install telephone jacks in wet locations unless the jack is specifically designed for it
- Never touch uninsulated telephone wires or terminals unless the telephone line is disconnected at the network interface

- Use caution when installing or modifying telephone lines
- Remove power cables from all installed power supplies before opening the chassis

Prevent Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It can occur if electronic printed circuit cards are improperly handled and can cause complete or intermittent failures. Always follow these ESD prevention procedures when removing and replacing modules:

- Ensure that the router chassis is electrically connected to the ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.
- If no wrist strap is available, ground yourself by touching a metal part of the chassis.



Caution For the safety of your equipment, periodically check the resistance value of the anti-static strap. It should be between 1 and 10 megohms (Mohm).

General Site Requirements

This section describes the requirements your site must meet for the safe installation and operation of your router. Ensure that the site is properly prepared before beginning installation. If you are experiencing shutdowns or unusually high errors with your existing equipment, the guidelines provided in this section can also help you isolate the cause of failures and prevent future problems.

General Precautions

Observe the following general precautions when using and working with your Cisco Catalyst 8200 Series Edge Platforms:

- Keep your system components away from radiators and heat sources, and do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment.
- Do not push any objects into the openings of your system components. Doing that can cause fire or electric shock by shorting out interior components.
- Position system cables and power supply cables carefully. Route system cables and the power supply cable and plug so that they cannot be stepped on or tripped over. Be sure that nothing else rests on your system component cables or power cable.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for electrical modifications at your site. Always follow your local and national wiring rules.
- If you turn off your system, wait at least 30 seconds before turning it on again to avoid system component damage.

Site Selection Guidelines

Cisco Catalyst 8200 Series Edge Platforms require specific environmental operating conditions. Temperature, humidity, altitude, and vibration can affect the performance and reliability of the router. The following sections provide specific information to help you plan for the proper operating environment.

Site Environmental Requirements

Environmental monitoring in the router protects the system and components from damage caused by excessive voltage and temperature conditions. To ensure normal operation and avoid unnecessary maintenance, plan and prepare your site configuration before installation. After installation, ensure the site maintains the required environmental characteristics.

Table 5: Router Environmental Tolerances

Environmental Characteristic	Minimum	Maximum
Steady State Operating	0° C	40° C (40° C at 10,000 feet)
Storage	-20° C	+70° C
Humidity operating (noncondensing)	10%	90%
Humidity nonoperating (noncondensing)	5%	95%
Altitude operating: over allowable temperature range (0 to 40° C)	–500 feet	13,000 feet
Altitude, nonoperating: over allowable temperature range	–500 feet	15,000 feet

Physical Characteristics

Be familiar with the physical characteristics of the Cisco Catalyst 8200 Series Edge Platforms to assist you in placing the system in the proper location.

The height, width, depth and weight of the chassis are displayed in this table:

Characteristic	Measurement
Height	1.73 inches (4.39 cm) — 1RU rack-mount
Width	17.25 inches (43.815 cm)
Depth	11.8 inches (29.972cm)
Weight	10.80 lbs. (4.9 kg)

For more information on the physical characteristics of Cisco Catalyst 8200 Series Edge Platforms, refer to the datasheet for the Cisco Catalyst 8200 Series Edge Platforms.

Rack Requirements

The Cisco Catalyst 8200 Series Edge Platforms is designed for use with a 19-inch rack.

The following information can help you plan your equipment rack configuration:

- Allow clearance around the rack for maintenance.
- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each device generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment at the bottom of the rack can be drawn upward into the intake ports of the equipment above it.

Power Guidelines and Requirements

Check the power at your site to ensure that you are receiving "clean" power (free of spikes and noise). Install a power conditioner if necessary.

The AC power supply includes the following features:

- Autoselects either 110 V or 220 V operation.
- All units include a 6-foot (1.8-meter) electrical power cord. (A label near the power inlet indicates the correct voltage, frequency [only AC-powered systems], current draw, and power dissipation for the unit.)

For additional information on the power requirements, refer to the Cisco Catalyst 8200 Series Edge Platforms datasheet.

Network Cabling Specifications

The following sections describe the cables required to install your Cisco Catalyst 8200 Series Edge Platforms:

Console Port Considerations

This device includes an asynchronous serial console port. You access to the device locally using a console terminal connected to the console port. This section discusses important cabling information that you must consider before connecting the device to a console terminal.

Flow control paces the transmission of data between a sending and a receiving device. Flow control ensures that the receiving device can absorb the data sent to it before the sending device sends more data. When the buffers on the receiving device are full, a message is sent to the sending device to suspend transmission until the data in the buffers is processed. Console terminals send data at speeds slower than the speeds modems do; therefore, the console port is ideally suited for use with console terminals.



Note Cisco Catalyst 8200 Series Edge Platforms have both EIA/TIA-232 asynchronous (RJ-45) and USB 5-pin mini Type B, 2.0 compliant serial console ports. Shielded USB cables with properly terminated shields are recommended.

EIA/TIA-232

Depending on the cable and the adapter used, this port appears as a DTE or DCE device at the end of the cable. At a time, only one port can be used.

The default parameters for the console port are 9600 baud, 8 data bits, 1 stop bit, and no parity. The console port does not support hardware flow control.

Prepare for Network Connections

When setting up your device, consider distance limitations and potential electromagnetic interference (EMI) as defined by the applicable local and international regulations.

Ethernet Connections

The IEEE has established the Ethernet IEEE 802.3 Standards. The devices support the following Ethernet implementations:

- 1000BASE-T—1000 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable. Supports the Ethernet maximum length of 328 feet (100 meters).
- 100BASE-T—100 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable. Supports the Ethernet maximum length of 328 feet (100 meters).
- 10BASE-T—10 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable. Supports the Ethernet maximum length of 328 feet (100 meters).

Required Tools and Equipment for Installation and Maintenance

Note **Statement 1089—**Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.

Warning **Statement 1090—**Installation by a Skilled Person

Only a skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of a skilled person.

Warning **Statement 1091—**Installation by an Instructed Person or Skilled Person

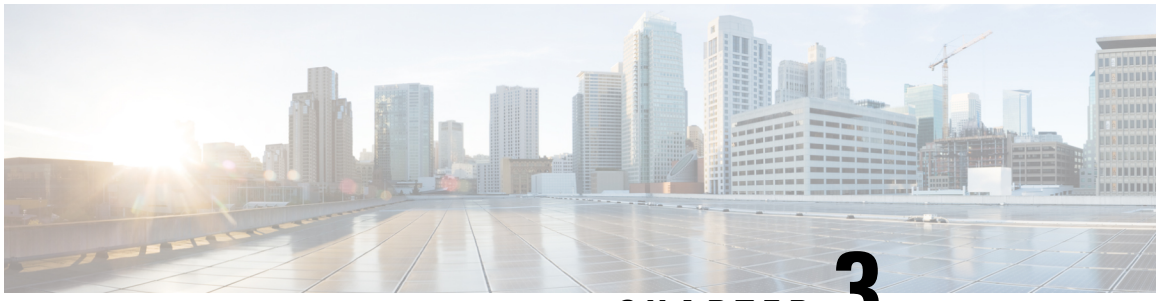
Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed person or skilled person.

You need the following tools and equipment to install and upgrade the router and its components:

- ESD-preventive cord and wrist strap
- Number 2 Phillips screwdriver
- Phillips screwdrivers: small, 3/16-in. (4 to 5 mm) and medium, 1/4-in. (6 to 7 mm)
  - To install or remove modules
  - To remove the cover, if you are upgrading memory or other components
- Screws that fit your rack
- Wire crimper
- Wire for connecting the chassis to an earth ground:
  - AWG 6 (13 mm²) wire for NEBS-compliant chassis grounding
  - AWG 14 (2 mm²) or larger wire for NEC-compliant chassis grounding
  - AWG 18 (1 mm²) or larger wire for EN/IEC 60950-compliant chassis grounding
- For NEC-compliant grounding, an appropriate user-supplied ring terminal, with an inner diameter of 1/4 in. (5 to 7 mm)

In addition, depending on the type of modules you plan to use, you might need the following equipment to connect a port to an external network:

- Cables for connection to the WAN and LAN ports (dependent on configuration)
- Ethernet hub or PC with a network interface card for connection to an Ethernet (LAN) port.
- Console terminal (an ASCII terminal or a PC running HyperTerminal or similar terminal emulation software) configured for 9600 baud, 8 data bits, 1 stop bit, no flow control, and no parity.
- Modem for connection to the auxiliary port for remote administrative access (optional).
- Data service unit (DSU) or channel service unit/data service unit (CSU/DSU) as appropriate for serial interfaces.
- External CSU for any CT1/PRI modules without a built-in CSU.



CHAPTER 3

Install and Connect

This chapter describes how to install and connect the Cisco Catalyst 8200 Series Edge Platforms to WAN, and Voice networks.

The following sections provide the technical details:

- Safety Warnings, on page 23
- What You Need to Know, on page 25
- Before You Begin, on page 25
- Unpack the Device, on page 25
- Install the Device, on page 25
- Connect Power to the Device, on page 36
- Overview of the Power Options, on page 36
- Connect to a Console Terminal or Modem, on page 38
- Connect WAN Interfaces, on page 39

Safety Warnings

Warning **Statement 1100—**Before Making Telecommunication Network Connection

High touch/leakage current—Permanently connected protective earth ground is essential before connecting to the telecommunication network.

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

This product is a Class 1 laser product.

Warning **Statement 445—**Connect the Chassis to Earth Ground

To reduce the risk of electric shock, connect the chassis of this equipment to permanent earth ground during normal use.



Warning **Statement 1022—**Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.



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 1056—**Unterminated Fiber Cable

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.



Note **Statement 1089—**Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.



Warning **Statement 1090—**Installation by a Skilled Person

Only a skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of a skilled person.



Warning **Statement 1091—**Installation by an Instructed Person or Skilled Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed person or skilled person.



Warning **Statement 1255—**Laser Compliance Statement

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.

What You Need to Know

CLI Console Access

Use the USB or RJ-45 console port on the router to access the Cisco Internet Operating System (IOS-XE) and XE SD-WAN command line interface (CLI) on the router and perform configuration tasks. A terminal emulation program is required to establish communication between the router and a PC. See the Connect to a Console Terminal or Modem section in this document for instructions.



Note A Microsoft Windows USB driver must be installed before you establish physical connectivity between the router and the PC.

Software Licenses

To use all the features on the router, you must purchase a software package. For more information on software licenses, see the “Smart Licensing” section of the Software Configuration Guide.

Before You Begin

Before installing and connecting Cisco Catalyst 8200 Series Edge Platforms, read the safety warnings and gather the following tools and equipment. For more information about the required tools and equipments, see the tools and equipment section.

Unpack the Device

Do not unpack the device until you are ready to install it. If the final installation site will not be ready for some time, keep the chassis in its shipping container to prevent accidental damage. When you are ready to install the chassis, proceed with unpacking it.

The chassis, accessory kit, publications, and any optional equipment you ordered may be shipped in more than one container. When you unpack the containers, check the packing list to ensure that you received all of the items on the list.

Install the Device

If you need to install Network Interface Modules (NIMs), Pluggable Interface Modules (PIMs), and Field-Replaceable Units (FRUs) on the Cisco Catalyst 8200 Series Edge Platforms devices, then, you can install them either before or after you install the device. Ideally, you can install these modules when you have access to the I/O side of the device. Internal modules, memory cards and fan trays should be installed before rack-mounting the device.

You can install the device in one of the following ways:

- Set the chassis on a desktop

- Attach the chassis to the wall
- Mount the chassis on a rack

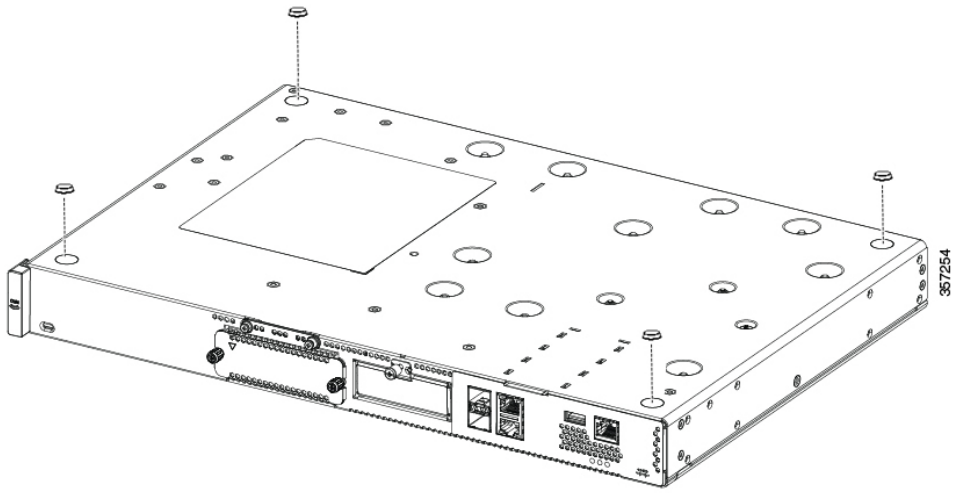
Mount the Chassis on a Desktop

Warning **Statement 1032—**Lifting the Chassis

To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules, such as power supplies, fans, or cards. These types of handles are not designed to support the weight of the unit.

The Cisco Catalyst 8200 Series Edge Platforms have circular markings on the bottom of the chassis for rubber feet. Apply the rubber feet when installing the router on horizontal surface (desk or shelf).

Figure 7: Applying Rubber Feet to the Router



Note Do not set the chassis in an area where the moderate acoustic noise can be an issue.

Caution Do not place anything on top of the device that weighs more than 10 pounds (4.5 kg), and do not stack device on a desktop. Excessive distributed weight of more than 10 pounds, or pound point load of 10 pounds on top could damage the chassis.

Caution Your chassis installation must allow unrestricted airflow for chassis cooling. For placing the device on a desktop, keep at least 1 inch (2.54 cm) of clear space beside the cooling inlet and exhaust vents.

After the device is installed, you must connect the chassis to a reliable earth ground. For the chassis ground connection procedures, see the Chassis Grounding section.

Rack Mount the Chassis

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.

The Catalyst 8200 Series Edge Platforms can be installed in 19-inch (48.26-cm) racks. You can order the standard brackets for mounting the chassis in a 19-inch EIA rack.

The mounting ears for the device are designed for #12-24 UNC screws for rack mounting.

You can rack-mount the device in the following ways:

- I/O-side mounting—Brackets attached at the front of the chassis with the front panel facing forward
- Power-input side mounting—Brackets attached at the back of the chassis with the back panel facing forward

Attach the Rack-Mounting Brackets

Caution Do not over-torque the screws. The recommended torque is 15 to 18 inch-lbs (1.7 to 2.0 N-m).

Caution Your chassis installation must allow unrestricted airflow for chassis cooling.

Attach the mounting brackets to the chassis as shown in the below figure using the screws provided. Use a #2 Philips screwdriver.

To attach the rack-mounting brackets to the Cisco 8200 Series device, perform these steps:

Procedure

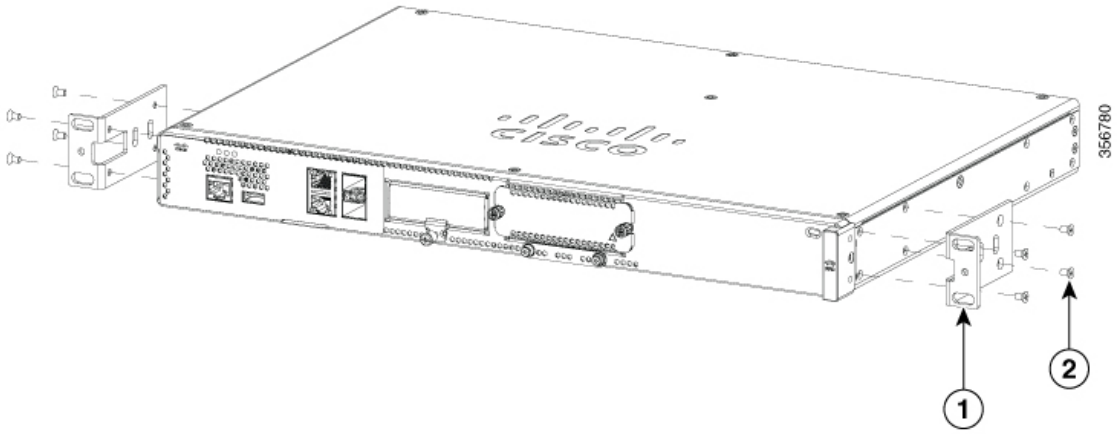
Step 1 Select the mounting orientation for the router in the equipment rack. I/O- side (recessed to allow space for the RFID badge) or power-input side (flush).

Step 2 Align the rack mount bracket with the mounting holes in the side of the device.

Step 3 Insert the #6-32 FHM screws. Use only the screws that are provided in the rack mount bracket kit.

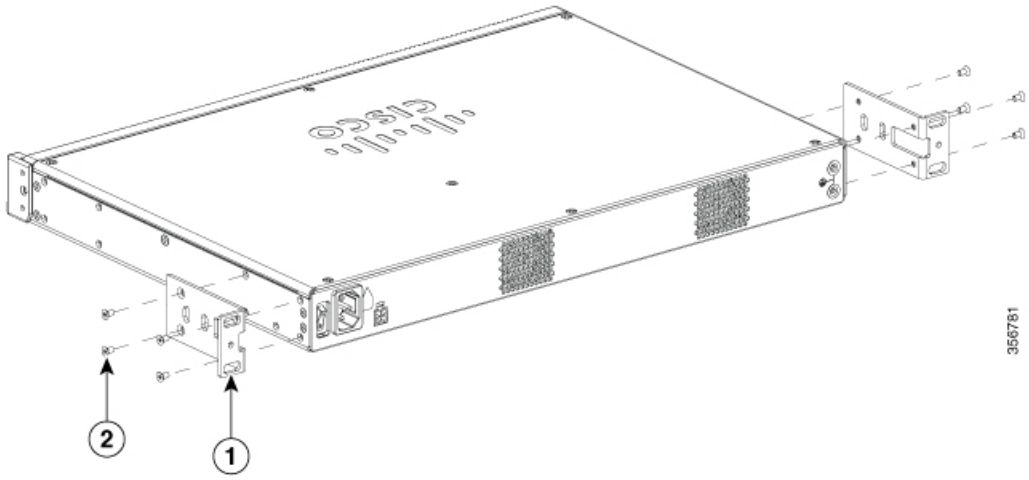
Step 4 Tighten the screws to a torque value of 15 to 18 inch-lb. (1.7 to 2.0 N-m).

Figure 8: Bracket Installation for I/O Side Mounting



1	Rack Mounting brackets
2	Mounting screws

Figure 9: Bracket Installation on Power-input Side Mounting



1	Rack Mounting brackets
2	Mounting screws

Mount the Chassis on a Rack

After you attach the brackets to the device, install the chassis on the rack as shown in following figures. You need two screws to attach each bracket to the rack. Total four screws are required to attach the device to the rack. The screws for attaching the device to the rack are not provided with the kit.

Tip For the 19-inch EIA brackets, start the lower pair of screws first, and rest the brackets on the lower screws while you insert the upper pair of screws.

Tip The screw slots in the brackets are spaced to line up with every *second* pair of screw holes in the rack. When the correct screw holes are used, the small threaded holes in the brackets line up with unused screw holes in the rack. If the small holes do not line up with the rack holes, you must raise or lower the brackets to the next rack hole.

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

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

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

Warning **Statement 1032—**Lifting the Chassis

To prevent personal injury or damage to the chassis, never attempt to lift or tilt the chassis using the handles on modules, such as power supplies, fans, or cards. These types of handles are not designed to support the weight of the unit.

Figures below shows a typical rack mounting of a chassis in a rack.

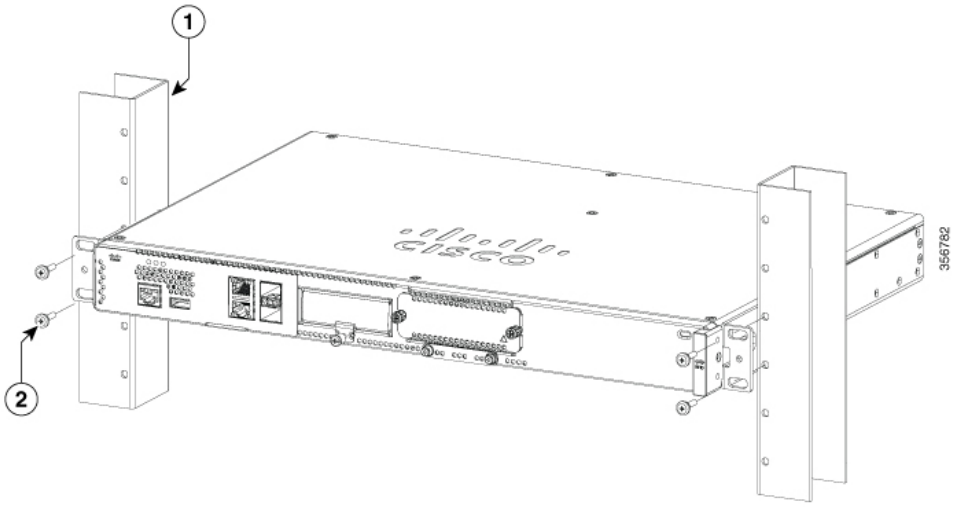
Step1. Locate the desired position in the equipment rack.

Step2. Align the holes in the rack mount brackets with the mounting holes in the equipment frame.

Step3. Secure the device using mounting screws appropriate for your equipment frame. The rack mount brackets have been designed #12-24 PHM screws.

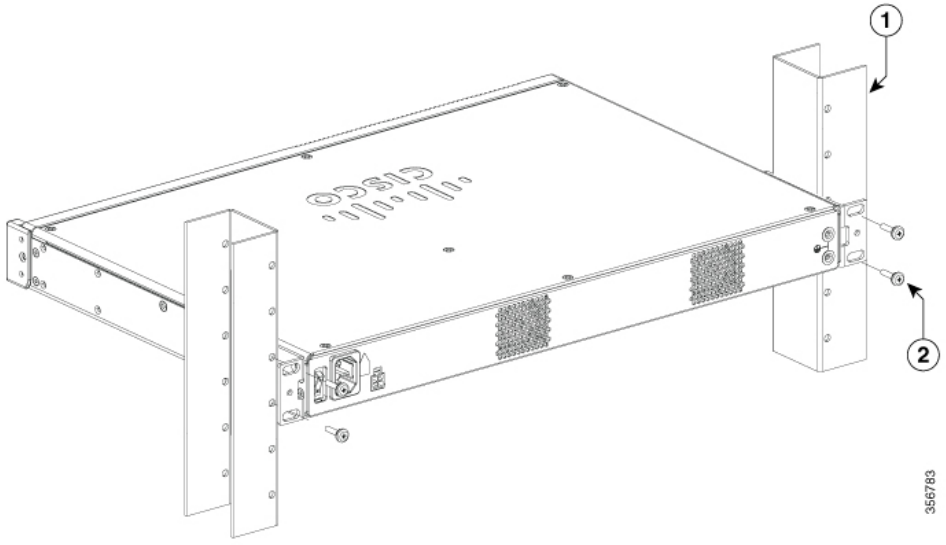
Step4. Tighten the screws to the appropriate torque value for your equipment

Figure 10: Mounting the Chassis on the Rack – I/O-Side (Cisco 8200 Series Chassis)



1	Rack
2	Rack Mounting screws

Figure 11: Mount the chassis on the rack - Power-input Side (Cisco 8200 Series Chassis)



1	Rack
1	Rack Mounting screws

Attach Cisco Catalyst 8200 Series Edge Platforms on a Wall

Caution When mounted on a wall, the Catalyst 8200 Series Edge Platforms should always be oriented with a side of the device oriented in the downward position. The I/O side and power-input side should be oriented so that the fan vents and cable entry will be oriented to the left or right. Neither the I/O side nor Power-input side should ever be oriented downwards.

Caution Your chassis installation must allow unrestricted airflow for chassis cooling.

Step 1 Attach the rack mount brackets to the sides of the device using only the hardware provided in the wall mounting kit (#6-32 x 0.44 inch PHMS).

Step 2 The outer face of the rack mount bracket ear, the part that typically mounts to an equipment rack, should be placed against the side of the router. Use the spacers provided to adapt the larger obround holes down to smaller holes for the screws to fit into.

Step 3 The brackets should be located diagonally from each other as shown in the figure below.

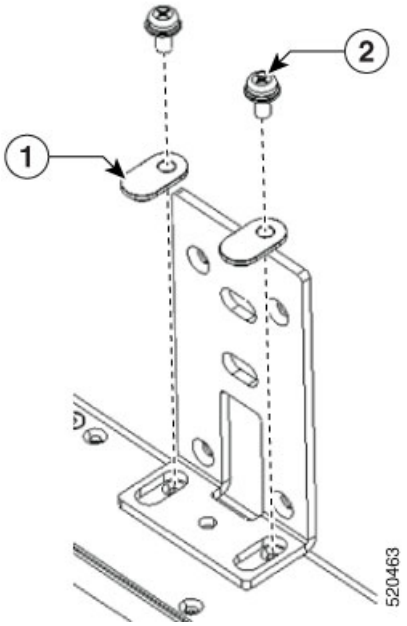
Step 4 Tighten the screws to a torque value of 15 to 18 inch-lb. (1.7 to 2.0 N-m).

Step 5 Use #6 or 4mm hardware to secure the brackets to the wall; at least 2 per bracket. Securing hardware should be a minimum of 1 inch in length (25.4 mm).

Note The customer must supply the appropriate hardware for securing the mounting brackets to the wall. Each mounting bracket has 4 holes and 2 slots that may be used for mounting the brackets to the wall.

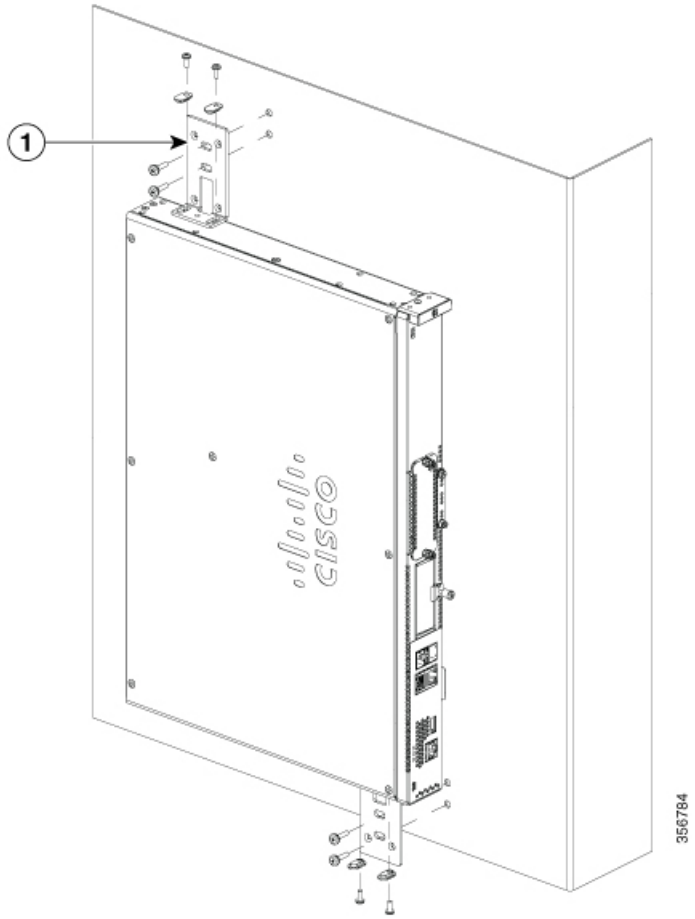
Step 6 Route the cables so that they do not put a strain on the connectors or mounting hardware.

Figure 12: Attach Wall Mount Brackets (Cisco 8200 Series Chassis)

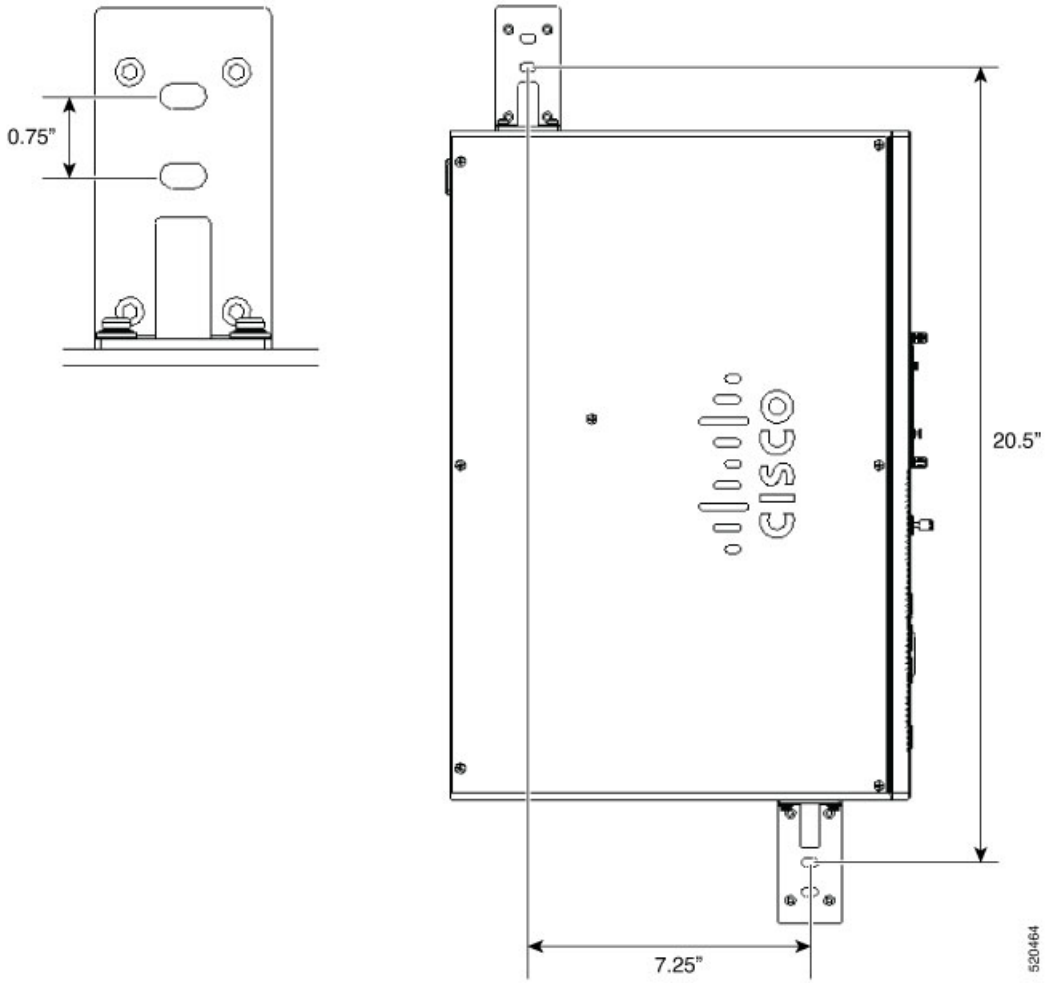


1	Bracket slot spacer for screw. Orient spacer in slot as shown.
2	Screws

Figure 13: Wall Mount the Cisco 8200 Series Chassis



1	Wall-mount bracket against wall



Ground the Chassis

After the device is installed, you must connect the chassis to a reliable earth ground.

Chassis Grounding

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.

You must connect the chassis to a reliable earth ground; the ground wire must be installed in accordance with local electrical safety standards.

- For grounding, use size 6 AWG (13 mm²) copper wire and the ground lug provided in the accessory kit.

Note This equipment is suitable for installation in Network Telecommunications Facilities and locations where the NEC applies. The equipment is suitable for installation as part of the Common Bonding Network (CBN).

- For NEC-compliant grounding, use size 14 AWG (2 mm²) or larger copper wire and an appropriate user-supplied ring terminal with an inner diameter of 1/4 in. (5–7 mm)
- AWG 10 (4 mm²) or larger wire for EN/IEC 60950-1 and EN/IEC 62368-1 compliant chassis grounding

Note The grounding wire should be sized according to local and national installation requirements. The above recommended AWG values for NEBS-compliant, NEC-compliant, EN/IEC 60950-1 and EN/IEC 62368-1 as the minimum requirement respectively, the higher AWG value recommendation also with the higher priority, this means AWG 10 is the minimum requirement only when NEBS is not required. Commercially available 6-AWG grounding wire is always preferred from the chassis to the rack ground or directly to the common bonding network (CBN). The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.

To install the ground connection for your device, perform the following steps:

Procedure

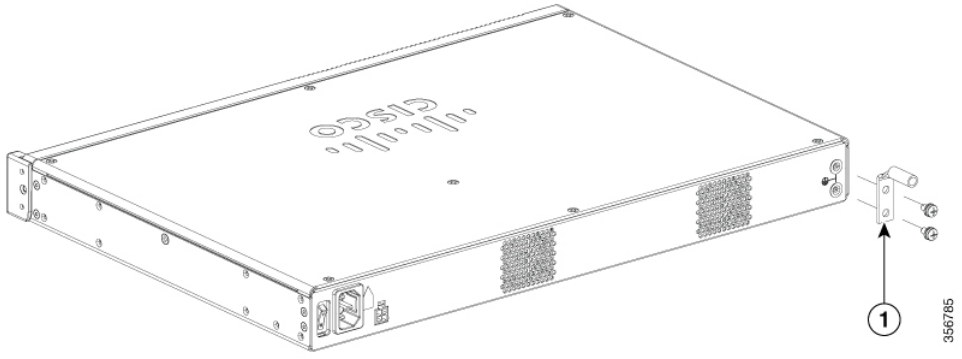
Step 1 Strip one end of the ground wire to the length required for the ground lug or terminal.

- For the ground lug—approximately 0.75 inch (20 mm)
- For user-provided ring terminal—as required

Step 2 Crimp the ground wire to the ground lug or ring terminal, using a crimp tool of the appropriate size.

Step 3 Attach the ground lug or ring terminal to the chassis as shown in Chassis Grounding section. For a ground lug, use the two screws with captive locking washers provided. For a ring terminal, use one of the screws provided. Tighten the screws to a torque of 8 to 10 in-lb (0.9 to 1.1 N-m).

Figure 14: Chassis Ground Connection on the Cisco 8200 Series Chassis



1	Ground lug

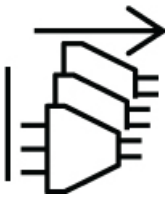
Step 4 Connect the other end of the ground wire to a known reliable earth ground point at your site.

Connect Power to the Device

This section explains how to connect power to the device.

Warning **Statement 1028—**More Than One Power Supply

This unit might have more than one power supply connection. To reduce risk of electric shock, remove all connections to de-energize the unit.



Note The installation must comply with all required electrical codes applicable at the installation site.

If your device uses AC power, connect it to a 15 A, 120 VAC (10 A, 240 VAC) circuit with overcurrent protection.

Note The input voltage tolerance limits for AC power are 90 and 264 VAC.

Note This product requires surge protection to be provided as part of the building installation. To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, an external surge protective device (SPD) is required at the AC power service equipment.

Warning **Statement 1005**—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than: 20A.

Overview of the Power Options

The Powering options for the Cisco Catalyst 8200 Series Edge devices are as follows:

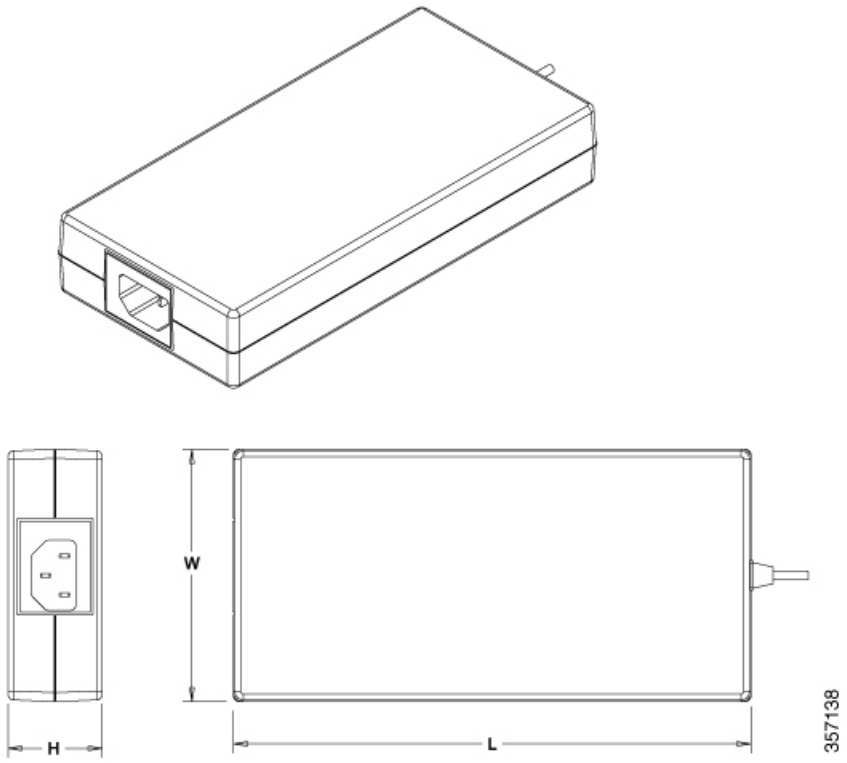
- 100W internal PSU (not field upgradeable). Powers the full router with standard AC cord. Always provided.
- 150W external POE adapter. Optional power input when POE output or modules is required.

Powering On the Server

An external POE supply may be ordered if required. The table below shows the physical parameters depending on the supplier.

Note The POE supply provided may be of different sizes.

PSU	Delta PSU	FSP PSU
Main Part Dimensions	L-200 * W-100 * H-43 mm	L-177 * W-86 * H-32.2 mm
Weight	1.015 KG	0.575 KG

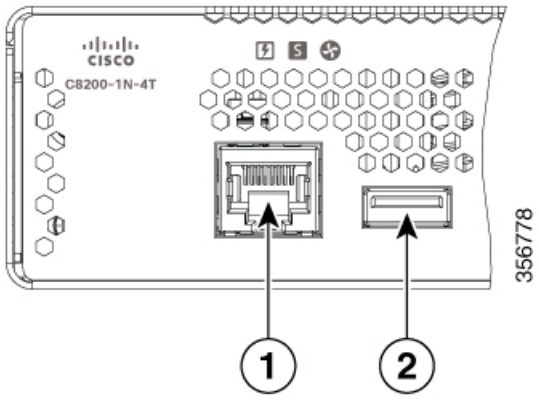


Connect to a Console Terminal or Modem

The Cisco Catalyst 8200 Series Edge Platforms have asynchronous serial ports. These ports provide administrative access to the router either locally (with a console terminal or a PC).To configure the router through the Cisco IOS CLI, you must establish a connection between the router console port and either a terminal or a PC.

Use the following cables and adapters to establish a local or remote connection.

Figure 15: Local and Remote Connections



Port Type	Cable	Section
1. Serial (RJ-45)	EIA RJ-45	Connect to the Serial Port with Microsoft Windows

Connect to the Console Port with Mac OS X

This procedure describes how to connect a Mac OS X system USB port to the console using the built in OS X Terminal utility.

Procedure

Step 1 Use the Finder to go to Applications > Utilities > Terminal.

Step 2 Connect the OS X USB port to the router.

Step 3 Enter the following commands to find the OS X USB port number

Example:

```
macbook:user$ cd /dev
macbook:user$ ls -ltr /dev/*usb*
crw-rw-rw-  1 root    wheel       9,  66 Apr  1 16:46 tty.usbmodem1a21 DT-macbook:dev user$
```

Step 4 Connect to the USB port with the following command followed by the router USB port speed

Example:

```
macbook:user$ screen /dev/tty.usbmodem1a21 9600
```

To disconnect the OS X USB console from the Terminal window

Enter Ctrl-a followed by Ctrl-\

Connect to the Console Port with Linux

This procedure shows how to connect a Linux system USB port to the console using the built in Linux Terminal utility.

Procedure

Step 1 Open the Linux Terminal window.

Step 2 Connect the Linux USB port to the router.

Step 3 Enter the following commands to find the Linux USB port number

Example:

```
root@usb-suse# cd /dev
root@usb-suse /dev# ls -ltr *ACM*
crw-r--r--    1 root     root     188,   0 Jan 14 18:02 ttyACM0
root@usb-suse /dev#
```

Step 4 Connect to the USB port with the following command followed by the router USB port speed

Example:

```
root@usb-suse /dev# screen /dev/ttyACM0 9600
```

To disconnect the Linux USB console from the Terminal window

Enter Ctrl-a followed by : then quit

Connect WAN Interfaces

This section describes how to connect WAN interface cables.

Ports and Cabling

The connections summarized here are also described in detail in the document on Cisco.com: Cisco Modular Access Cable Specifications

Table 6: WAN and Voice Connections

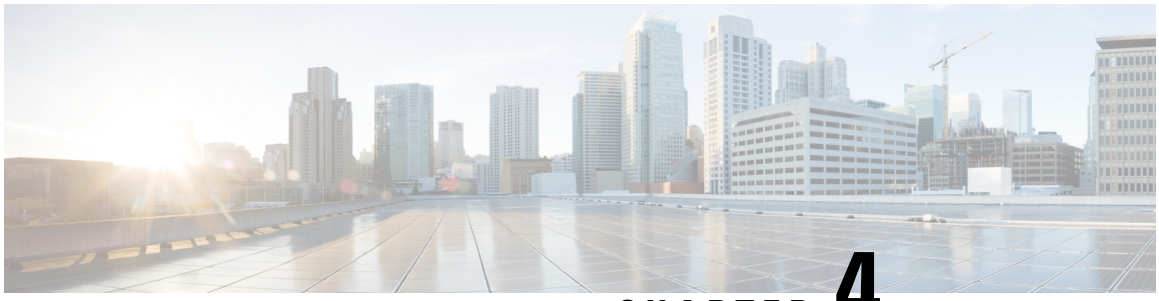
Port or Connection	Port Type, Color[1]	Connection:	Cable
Ethernet	RJ-45, yellow	Ethernet hub or Ethernet switch	Category 5 or higher Ethernet
T1/E1 WANxCE1T1-PRI	RJ-48C/CA81ARJ-48S, tan	T1 or E1 networkExternal T1 CSU or other T1 equipment	RJ-48 T1/E1RJ-48S to RJ-48S TERJ-48S to RJ-48S NTRJ-48S to RJ-48S T1RJ-48S to bareRJ-48S to BNCRJ-48S to twinaxial cableRJ-48S to DB-15RJ-48S to DB-15 null
T3/DS3/E3 WAN	BNC connector	T3 network, CSU/DSU, or other T3/DS3 equipment	75-ohm coaxial cable
Cisco serial	60-pin D-sub, blue	CSU/DSU and serial network or equipment	Cisco serial transition cable that matches the signaling protocol (EIA/TIA-232, EIA/TIA-449, V.35, X.21, or EIA-530) and the serial port operating mode (DTE or DCE).[2]
Cisco Smart serial	Cisco Smart compact connector, blue	CSU/DSU and serial network or equipment	
Gigabit Ethernet SFP, optical	LC, color according to optical wavelength	1000BASE-SX, -LX, -LH, -ZX, -CWDM	Optical fiber as specified on applicable data sheet
Gigabit Ethernet SFP, copper	RJ-45	1000BASE-T	Category 5, 5e, 6 UTP

1 Cable color codes are specific to Cisco cables.
2 See the Cisco Modular Access Router Cable Specifications document for information about choosing these cables.

General Precautions

Observe the following general precautions when using and working with your Cisco Catalyst 8200 Series Edge Platforms:

- Keep your system components away from radiators and heat sources, and do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment.
- Do not push any objects into the openings of your system components. Doing that can cause fire or electric shock by shorting out interior components.
- Position system cables and power supply cables carefully. Route system cables and the power supply cable and plug so that they cannot be stepped on or tripped over. Be sure that nothing else rests on your system component cables or power cable.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for electrical modifications at your site. Always follow your local and national wiring rules.
- If you turn off your system, wait at least 30 seconds before turning it on again to avoid system component damage.



CHAPTER 4

Install Internal Components and Field Replaceable Units

This document describes how to install internal components and field replaceable units (FRUs) in the Cisco Catalyst 8200 Series Edge Platforms. The installation information is contained in these sections:

- Safety Warnings, on page 41
- Locate and Access Internal Components, on page 43
- Remove and Replace DDR DIMMs, on page 45
- Install and Remove SFP Modules, on page 48
- Remove and Replace the USB Flash Token Memory Stick, on page 51
- Remove and Install an M.2 USB|NVMe Module, on page 51
- Remove the M.2 USB|NVMe Module, on page 52
- Install the M.2 USB|NVMe Module, on page 53
- Remove and replace the battery, on page 54

Safety Warnings

Warning **Statement 1100—**Before Making Telecommunication Network Connection

High touch/leakage current—Permanently connected protective earth ground is essential before connecting to the telecommunication network.

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

This product is a Class 1 laser product.

Warning **Statement 445—**Connect the Chassis to Earth Ground

To reduce the risk of electric shock, connect the chassis of this equipment to permanent earth ground during normal use.



Warning **Statement 1022—**Disconnect Device

To reduce the risk of electric shock and fire, a readily accessible disconnect device must be incorporated in the fixed wiring.



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 1056—**Unterminated Fiber Cable

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.



Note **Statement 1089—**Instructed and Skilled Person Definitions

An instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment.

A skilled person or qualified personnel is someone who has training or experience in the equipment technology and understands potential hazards when working with equipment.



Warning **Statement 1090—**Installation by a Skilled Person

Only a skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of a skilled person.



Warning **Statement 1091—**Installation by an Instructed Person or Skilled Person

Only an instructed person or skilled person should be allowed to install, replace, or service this equipment. See statement 1089 for the definition of an instructed person or skilled person.



Warning **Statement 1255—**Laser Compliance Statement

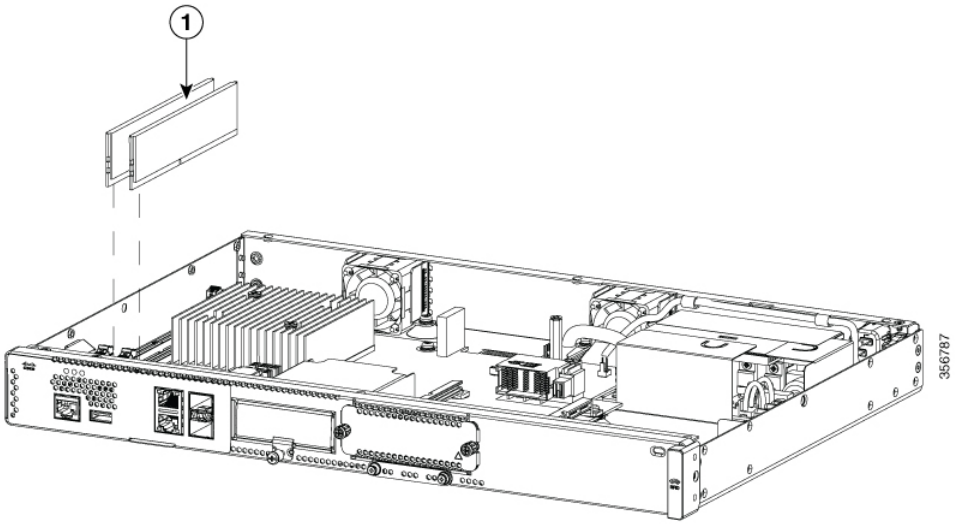
Pluggable optical modules comply with IEC 60825-1 Ed. 3 and 21 CFR 1040.10 and 1040.11 with or without exception for conformance with IEC 60825-1 Ed. 3 as described in Laser Notice No. 56, dated May 8, 2019.

Locate and Access Internal Components

The figures below show the locations of internal components on the motherboard. Internal modules include DIMMs on Cisco Catalyst 8200 Series Edge Platforms.

To access the internal components on the device, you must first remove the chassis cover. For instructions on how to remove and replace the chassis cover on the device, see the sections on Install and Remove Chassis Covers.

Figure 16: Internal Component Location in the Cisco 8200 Series Chassis



Sl. No	Modules
1	DIMMs

Remove and Replace the Chassis Cover

The Cisco Catalyst 8200 Series Edge Platforms have removable covers. Before removing the cover, do these steps:

- Do not run the device with the cover off. Doing so can cause the chassis to overheat very quickly.
- Disconnect all power cables.
- Remove the device from the rack.

Warning **Statement 1041—**Disconnect Telephone Network Cables

Before opening the unit, disconnect the telephone network cables to avoid contact with telephone network voltages.

Use a number-2 Phillips screwdriver to perform the following tasks.

Remove the Cover

To remove the cover, perform the following steps.

Procedure

Step 1 Read the Safety Warnings and disconnect the power supply before you perform any module replacement.

Step 2 Confirm the device is turned off and disconnected from the power supply or power supplies. If a redundant power is used, disconnect from the redundant power supply.

Step 3 Place the chassis on a flat surface.

Step 4 For Catalyst 8200 Series Edge Platforms, remove the 9 cover screws.

Step 5 Lift the cover straight up.

Replace the Cover

To replace the cover, perform the following steps.

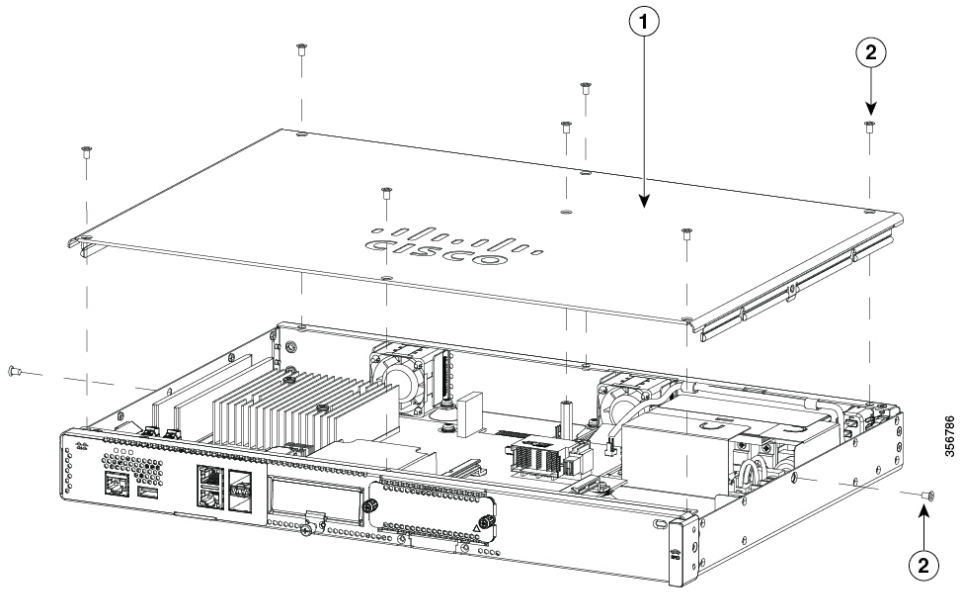
Procedure

Step 1 Place the chassis on a flat surface.

Step 2 Drop the cover straight down and ensure that the side flanges insert into the chassis. Care should be taken to not damage the EMC Gaskets.

Step 3 For Catalyst 8200 Series Edge Platforms, install the 9 cover screws.

Figure 17: Install the Cover on the Cisco 8200 Series Chassis



1	Cover
2	Screws

Remove and Replace DDR DIMMs

To access the DIMMs, you must remove the chassis cover as described in the Access and Install Modules section.

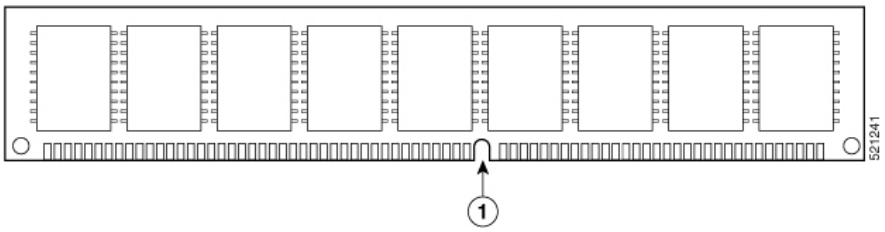
Caution Always wear an ESD-preventive wrist strap and ensure that it makes good contact with your skin when you remove or install DIMMs. Connect the equipment end of the wrist strap to the metal part of the chassis.

Caution Handle DIMMs by the edges only. DIMMs are ESD-sensitive components and can be damaged by mishandling.

Locate and Orient DIMM

DIMMs have a polarization notch on the mating edge to prevent incorrect insertion. The following image shows the polarization notch on a DIMM.

Figure 18: DIMM Showing Polarization Notch



1	Polarization notch

Remove a DIMM

Follow these steps to remove a DIMM:

Procedure

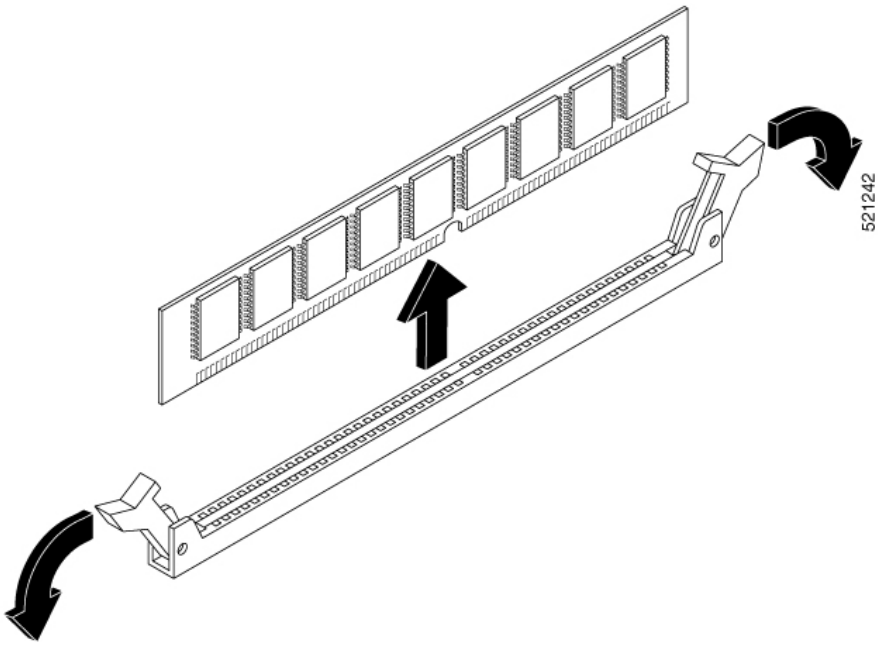
Step 1 Read the Safety Warnings section and disconnect the power supply before you perform any module replacement.

Step 2 If the cover is not already removed, remove the chassis cover.

Step 3 Locate the DIMM module to find the DIMM sockets on the chassis.

Step 4 Rotate DIMM connector handles downwards to extract the DIMM module.

Figure 19: Remove a DIMM



Install a DIMM

Follow these steps to install a DIMM on the Cisco Catalyst 8200 Series Edge Platforms.

Procedure

Step 1 Read the Safety Warnings section and disconnect the power supply before you perform any DIMM replacement.

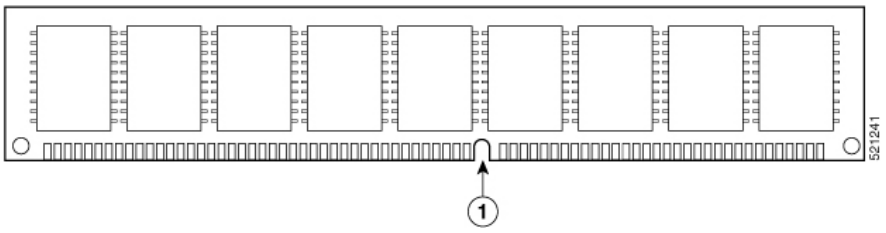
Step 2 If the cover is not already removed, remove the chassis cover.

Step 3 Locate the DIMM module to find the DIMM sockets on the device.

Step 4 Ensure that both latches on the DIMM connector are in the open position.

Step 5 Orient the DIMM so that the polarization notch lines up with the polarization key on the connector.

Figure 20: DIMM Showing Polarization Notch

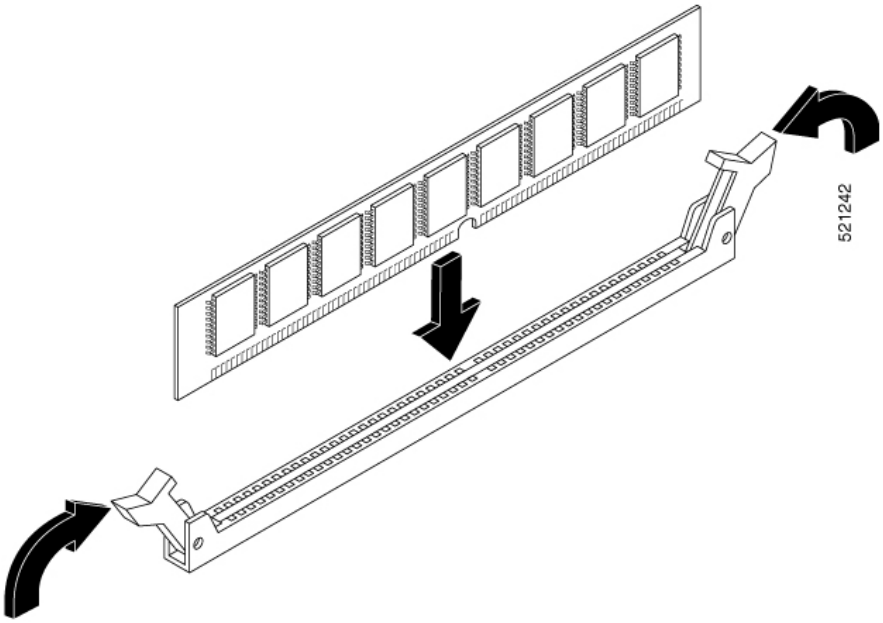


Step 6 Insert the DIMM into the connector one side at a time.

Step 7 Rotate the connector handles upward and click into place.

Step 8 Reinstall the chassis cover.

Figure 21: Install a DIMM



Step 9 Replace the chassis cover.

Install and Remove SFP Modules

Before you begin

See the Cisco Catalyst 8200 Series Edge Platforms's datasheet on cisco.com for a list of supported SFP modules. Use only supported SFP modules on the platform.

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

This product is a Class 1 laser product.

- Do not remove the dust plugs from the 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 module can shorten its useful life. Do not remove and insert any SFP module more often than is necessary.
- To prevent ESD damage, follow your normal board and component handling procedures when connecting cables to the switch and other devices.
- When you insert several SFP modules in multiple ports, wait for 5 seconds between inserting each SFP. This will prevent the ports from going into error disabled mode. Similarly, when you remove an 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 module.

On some 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 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 module in place.

Step 6 Remove the SFP dust plugs and save.

Step 7 Connect the SFP cables.

Laser Safety Guidelines

Optical Small-Form Pluggable (SFPs) use a small laser to generate the fiber-optic signal. Keep the optical transmit and receive ports covered whenever a cable is not connected to the port.

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 9001—**Product Disposal

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

Warning **Statement 1255—**Laser Compliance Statement

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.

To install an SFP module in your device, perform these steps:

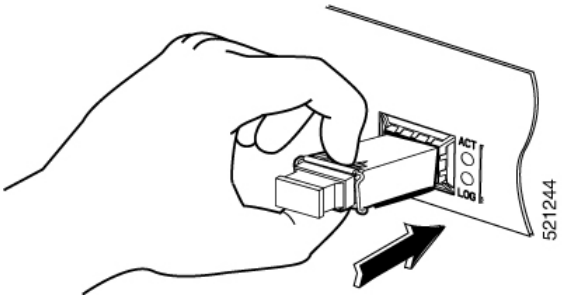
Procedure

Step 1 Read the Safety Warnings section and disconnect the power supply before you perform any module replacement.

Step 2 Slide the SFP into the device connector until it locks into position

Tip
If the SFP uses a bale-clasp latch (see Laser Safety Guidelines section, the handle should be on top of the SFP module.

Figure 22: Install a Small-Form Pluggable Module



Caution
Do not remove the optical port plugs from the SFP until you are ready to connect cabling.

Step 3 Connect the network cable to the SFP module.

Remove Small Form Pluggable Modules

Follow these steps to remove a Small Form Pluggable (SFP) from the device:

Procedure

Step 1 Read the Safety Warnings section and disconnect the power supply before you perform any module replacement.

Step 2 Disconnect all cables from the SFP.

Warning
Statement 1051—Laser Radiation

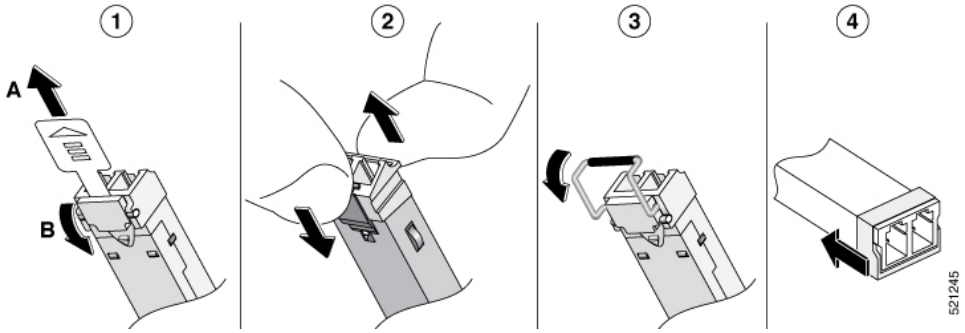
Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Caution
The latching mechanism used on many SFPs locks the SFP into place when cables are connected. Do not pull on the cabling in an attempt to remove the SFP.

Step 3 Disconnect the SFP latch.

Note
SFP modules use various latch designs to secure the module in the SFP port. Latch designs are not linked to SFP model or technology type. For information on the SFP technology type and model, see the label on the side of the SFP.

Figure 23: Disconnecting SFP Latch Mechanisms



1	Sliding latch	3	Bale-clasp latch
2	Swing and slide latch	4	Plastic collar latch

Tip
Use a pen, screwdriver, or other small straight tool to gently release a bale-clasp handle if you cannot reach it with your fingers.

Step 4 Grasp the SFP on both sides and remove it from the device.

Remove and Replace the USB Flash Token Memory Stick

The Cisco Catalyst 8200 Series Edge Platforms contain ports for a USB memory stick to store Cisco configurations or Cisco IOS XE consolidated packages.

Caution Do not remove a USB Flash memory module when issuing some file access command or a read/write operation to the Flash memory module when it is processing. The router might reload or the USB Flash memory module can be damaged. You can check to see if the USB activity LED on the router front panel is flashing, prior to the removal of the USB device

To install, remove a USB memory stick from the device, follow these steps:

Procedure

Step 1 Place the USB stick into the USB port.

Step 2 Type-C memory sticks are supported on USB port 1 and type-C memory can be inserted in any direction. Type-A memory sticks are supported on USB port 0 and it must be oriented correctly to allow for proper insertion.

Note
A sample of how the memory stick is inserted into the port.

Figure 24: USB Memory Stick

Note
You can insert or remove the memory stick whether the device is powered on or not.

1	USB Type C (3.0) (USB 1)
2	USB stick
3	USB Type A (3.0) (USB 0)

What to do next

This completes the USB Flash memory installation procedure.

Remove and Install an M.2 USB|NVMe Module

This section describes installing and replacing an M.2 USB|NVMe module on the Cisco Catalyst 8200 Series Edge Platforms.

Prevent Electrostatic Discharge Damage

The M.2 module is sensitive to electrostatic discharge (ESD) damage, which can occur when electronic cards or components are handled improperly. ESD results in complete or intermittent failures.

To prevent ESD damage, follow these guidelines:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact.
- Connect the equipment end of the strap to an unfinished chassis surface.
- Place the M.2 storage devices on an anti-static surface or in a static shielding bag. If you have to return the device to the factory, immediately place it in a static shielding bag.
- Avoid contact between the device and clothing. The wrist strap protects the device from ESD voltages on the body only; ESD voltages on clothing can still cause damage.
- Do not remove the wrist strap until the installation is complete.

Caution For safety, periodically check the resistance value of the anti static strap. The measurement should be between 1 and 10 megohms (Mohms).

Remove the M.2 USB|NVMe Module

To remove a M.2 USB|NVMe module, perform these steps:

Note The M.2 USB|NVMe modules for Cisco Catalyst 8200 Series Edge Platforms are flipped upside down.

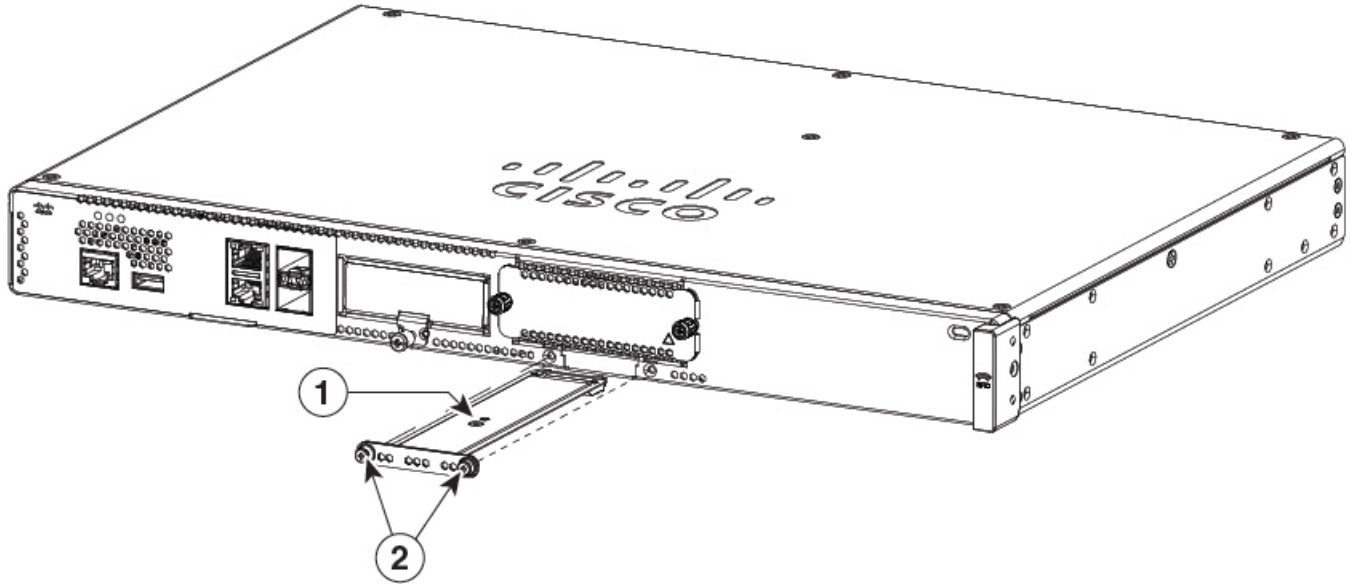
Procedure

Step 1 The device should be powered down and the power supply disconnected before you perform any module replacement.

Step 2 Loosen 2 mounting screws using a #1 Philips screwdriver.

Step 3 Gently pull the M.2 USB|NVMe module out and remove it from the device.

Figure 25: Remove the M.2 USB|NVMe Module (Cisco 8200 Series Chassis)



1	M.2 USB|NVMe module	2	Securing screws (torque 4-6 in-lbs)

Install the M.2 USB|NVMe Module

Note The M.2 USB|NVMe module's orientations are flipped. For the Cisco Catalyst 8200 Series device, the PCB faces down.

To install the M.2 USB|NVMe module, perform the following steps:

Procedure

Step 1 Read all Safety Warnings, ensure that the Cisco Catalyst 8200 Series device is not powered on.

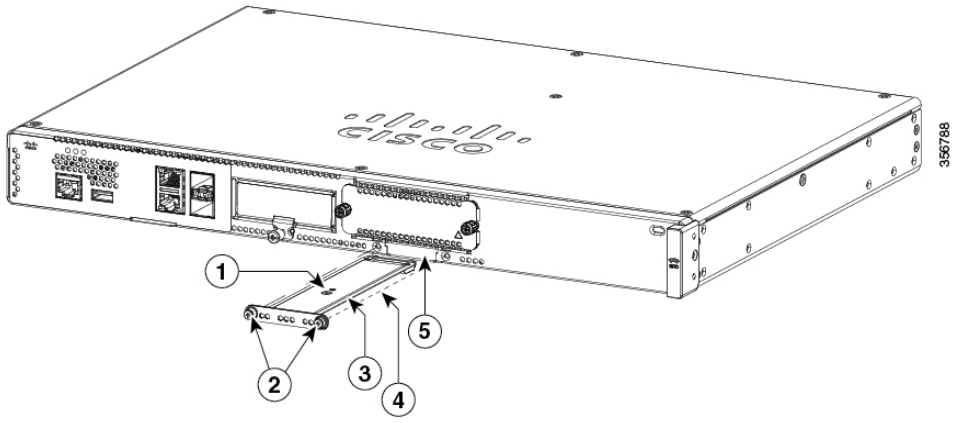
Step 2 Insert the M.2 USB|NVMe module into the slot of the device (as shown in the figure). The slide should engage the internal card guides.

Step 3 Gently slide the M.2 USB|NVMe module all the way in until the faceplate is flush with the device.

Step 4 Screw down and tighten the two Philips head screws. Torque it to 4-6 in lbs.

Step 5 The device can now be powered on.

Figure 26: Install the M.2 USB|NVMe (Cisco 8200 Series Chassis)



1	M.2 USB|NVMe	2	Securing screws (torque 4-6 in-lbs)
3	M.2 module orientation with metal carrier on top, M.2 module underneath.	4	M.2 module underneath
5	Chassis cutout prevents M.2 installation in wrong orientation.		

Remove and replace the battery

These instructions are provided in order to comply with the EU Battery Replaceability Requirement.

- This product was not specifically designed for battery replacement in the field.
- It is recommended that, whenever possible, follow the standard repair or return process for battery issues.

Caution Always wear an ESD-preventive wrist strap and ensure that it makes good contact with your skin when you remove or install the internal modules. Connect the equipment end of the wrist strap to the metal part of the chassis.

Remove the battery

Perform this procedure when the battery requires replacement or maintenance on supported hardware.

Note Follow proper electrostatic discharge (ESD) precautions before handling the battery or device.

Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.

Warning **Statement 1015**—Battery Handling

To reduce risk of fire, explosion or leakage of flammable liquid or gas:

- Replace the battery only with the same or equivalent type recommended by the manufacturer.
- Do not dismantle, crush, puncture, use sharp tool to remove, short external contacts, or dispose of in fire.
- Do not use if battery is warped or swollen.

Procedure

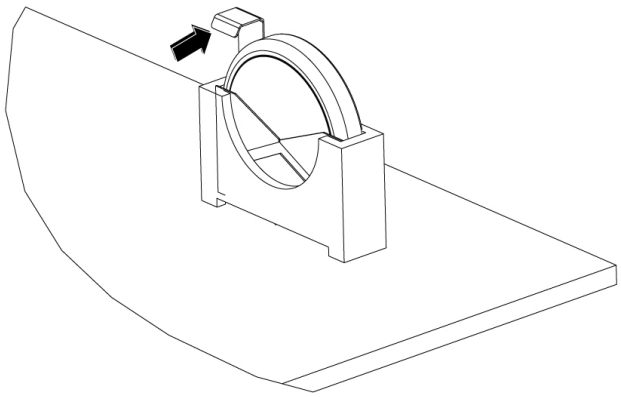
Step 1 Before you perform any module replacement, read the Safety Warnings section and disconnect the power supplies.

Step 2 Identify the type of battery holder and follow the instructions accordingly.

Step 3 For Battery Holder type 1, follow these instructions to remove the battery:

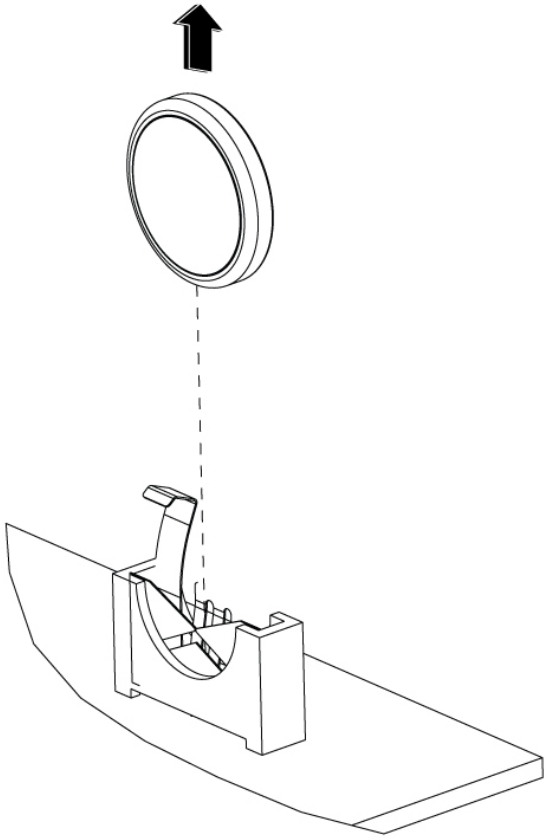
a) Pull the retention arm back from the battery.

Figure 27: Pull back the latch arm



b) Lift the battery out of the holder.

Figure 28: Remove the battery

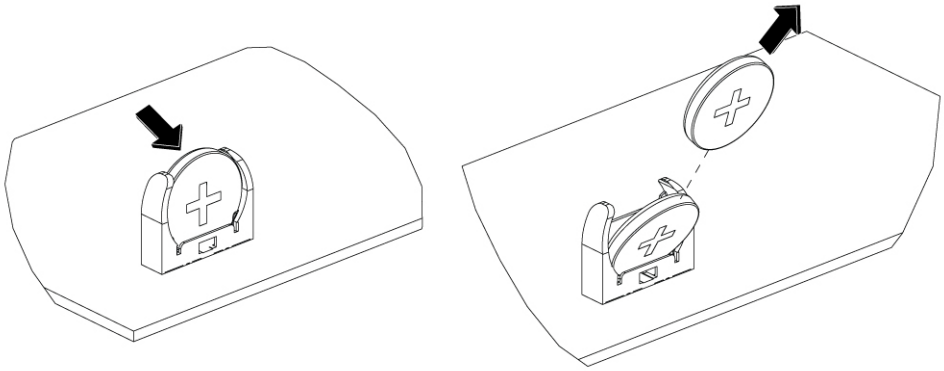


Step 4 For Battery Holder type 2, follow these instructions to remove the battery:

a) Pivot the battery in the direction shown.

b) Pull the battery out at an angle.

Figure 29: Remove the battery



Replace the battery

Replace the battery in the chassis following the safety procedures to ensure proper device functionality.

Note Follow proper electrostatic discharge (ESD) precautions before handling the battery or device.

Before you begin

- There are two types of battery holders that may be present on the PCBA. Identify the correct type and refer to the instructions specific to that type.
- The battery is a CR2032 or BR2032 type. Batteries should only be replaced with the same or an equivalent type recommended by the manufacturer.
  - Panasonic BR-2032/BN
  - VARTA CR2032

Procedure

Step 1 Read the Safety Warnings instructions and disconnect the power supplies before you perform any module replacement.

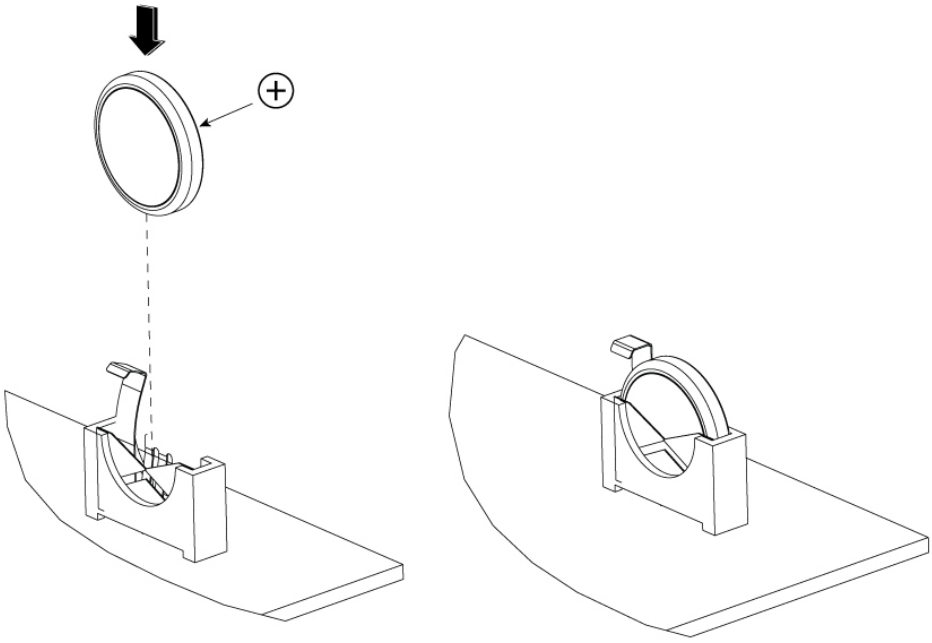
Step 2 Identify the type of battery holder and follow the instructions accordingly.

Step 3 For Battery Holder type 1, follow these instructions to replace the battery:

a) Orient the battery with positive polarity as shown.

b) Push the battery down into the holder. Once installed, the latch will snap back over the battery to secure it in place.

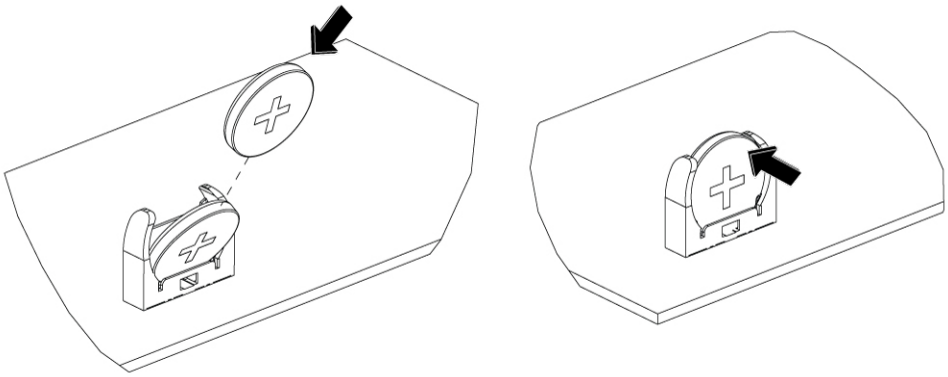
Figure 30: Install the battery

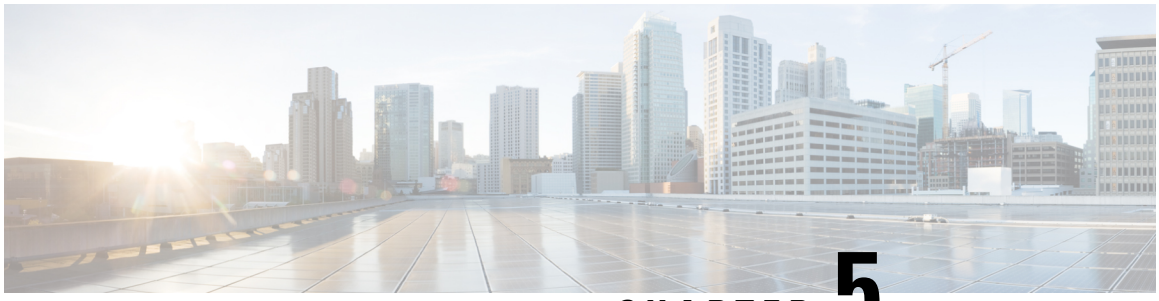


Step 4 For Battery Holder type 2, follow these instructions to replace the battery:

a) Orient the battery with positive polarity as shown.
b) Angle the battery so you can insert the edge of the battery into the holder base.
c) Rotate the battery and press into the base in the same motion to install the battery firmly in the holder.

Figure 31: Install the battery





CHAPTER 5

Install Cisco Catalyst Network Interface Module

This section provides information before and during the installation of Cisco Catalyst Network Interface Modules (NIMs) on the Cisco Catalyst 8200 Series Edge Platforms.

- Overview of the Network Interface Module, on page 59
- Remove and Install Network Interface Modules, on page 60

Overview of the Network Interface Module

The Cisco Catalyst Network Interface Module (NIM) is supported on Cisco Catalyst 8200 Series Edge Platforms.

These are the steps to install a NIM:

1. Locate the NIM slot on the front panel.
2. Loosen the screws to remove NIM blank cover.
3. Insert the NIM into the slot.
4. Tighten the screws to secure the NIM in the slot.

These are the steps to remove a NIM:

1. If the NIM is up and running, issue the following command to shut down the NIM gracefully before removing it:

   hw-module subslot slot 0/2 stop

Caution If you do not shut down the NIM gracefully before removing it, the NIM card could get damaged.

2. Locate the NIM slot on the front panel.
3. Loosen the screws that secure the NIM.
4. Gently pull out the NIM from the slot.

All module slots must have a module or blank installed for the product to work thermally and for safety purposes.

For additional information, see the Cisco Catalyst 8200 Series Edge Platforms datasheet on cisco.com for a list of supported NIMs on the platforms.

Remove and Install Network Interface Modules

Keep the following tools and equipment while working with the Network Interface Modules (NIM)s:

- Number 1 Phillips screwdriver or a small flat-blade screwdriver
- ESD-preventive wrist strap

Remove the Network Interface Module

Step 1 Shut down the electrical power to the slot in the device, turn off the electrical power to the device. Leave the power cable plugged-in to channel ESD voltages to ground.

Step 2 Remove all network cables from the rear panel of the device. Using a number 1 Phillips screwdriver, loosen the captive screws on the network interface module.

Step 3 Slide the network interface module out.

Step 4 If you are not replacing the module, install a blank faceplate over the empty slot to ensure proper air flow.

Install the Cisco Catalyst Network Interface Modules

Step 1 Shut down the electrical power to the slot in the router by turning off the electrical power to the router. Leave the power cable plugged in to channel ESD voltages to ground.

Step 2 Remove all network cables from the rear panel of the device.

Step 3 Remove the blank faceplates installed over the network interface module slot that you intend to use.



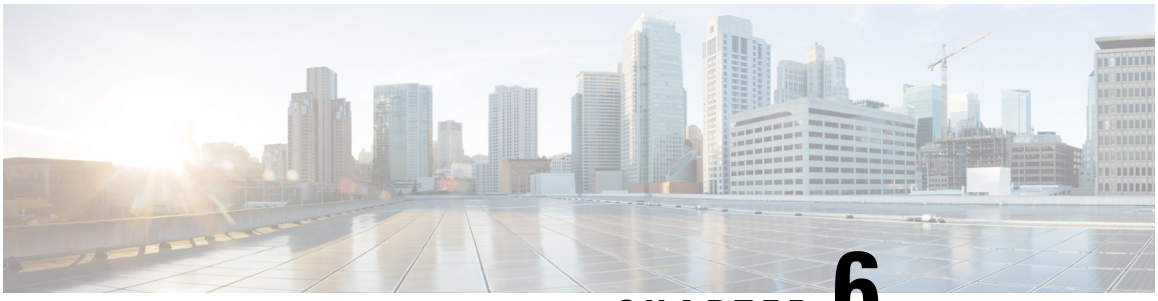
Note Save blank faceplates for future use.

Step 4 Align the module with the guides in the chassis walls or slot divider and slide it gently into the NIM slot on the device.

Step 5 Push the module into place until you feel the edge connector seat securely into the connector on the router backplane. The module faceplate should contact the chassis rear panel.

Step 6 Using a number 1 Phillips screwdriver, tighten the captive screws on the network interface module.

Step 7 Connect the module to the network and re-enable the power to the slot in the device.



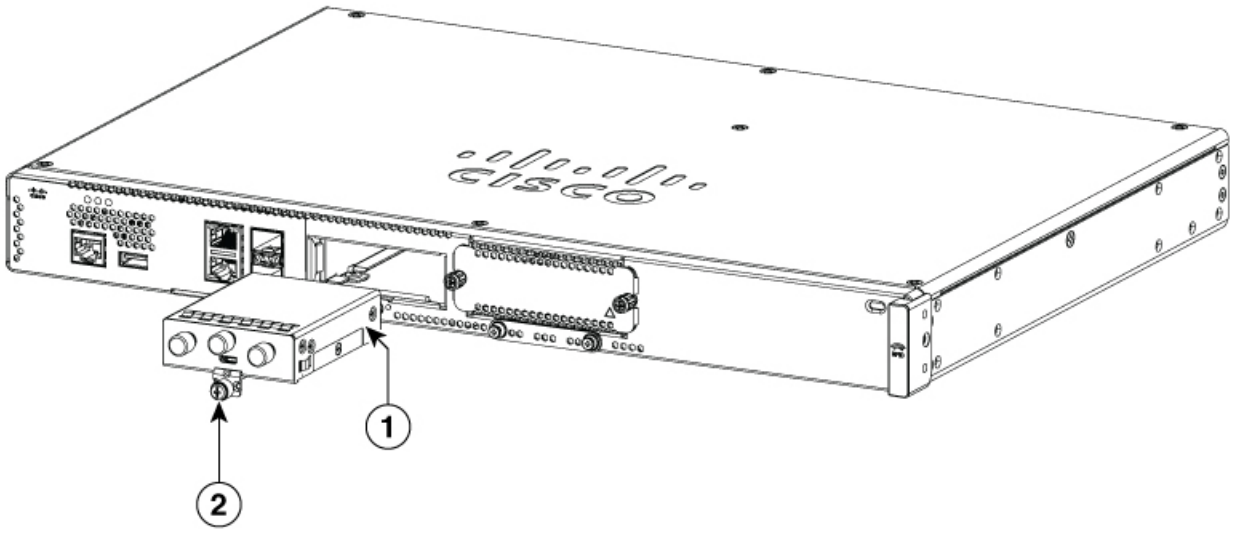
CHAPTER 6

Cisco Catalyst Pluggable Interface Module

This section provides information before and during the installation of Cisco Catalyst Pluggable Interface Module (PIM) on the Cisco Catalyst 8200 Series Edge Platforms.

For additional information on the supported PIMs, see the Cisco Catalyst 8200 Series Edge Platforms' datasheet on cisco.com for a list of supported PIMs on the platforms.

Figure 32: Pluggable Interface Module in a Cisco 8200 Series Chassis



1	Pluggable interface module (PIM)
2	Screw

- Safety Recommendations, on page 62
- Tools and Equipment Required During Installation, on page 62
- Remove Cisco Catalyst Pluggable Interface Module, on page 62
- Install a Cisco Catalyst Pluggable Interface Module, on page 63
- Configuring a Pluggable Interface Module, on page 64
- RF Band Mapping for Antenna Ports (For P-5GS6-GL only), on page 65
- Attaching the Antennas, on page 66

Safety Recommendations

To prevent hazardous conditions, follow these safety recommendations while working with this equipment:

- Keep tools away from walk areas where you or others could fall over them.
- Do not wear loose clothing around the router. Fasten your tie or scarf and roll up your sleeves to prevent clothing from being caught in the chassis.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Locate the emergency power-off switch in the room before you start working. If an electrical accident occurs, shut the power off.
- Before working on the router, turn off the power and unplug the power cord.
- Disconnect all power sources before doing the following:
  - Installing or removing a router chassis
  - Working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Always check that power is disconnected from a circuit.
- Remove possible hazards from your work area, such as damp floors, ungrounded power extension cables, or missing safety grounds.
- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Turn off power to the room using the emergency power-off switch.
  - Determine the condition of the victim and send another person to get medical aid or call for help.
  - Determine if the person needs rescue breathing or external cardiac compressions; then take appropriate action.

Tools and Equipment Required During Installation

You will need the following tools and equipment while working with the Cisco C-NIM-1X NIM:

- Number 1 Phillips screwdriver or a small flat-blade screwdriver
- ESD-preventive wrist strap

Remove Cisco Catalyst Pluggable Interface Module

To remove a PIM, perform these steps:

Procedure

Step 1 Read the Safety Warnings before you perform any task.

Step 2 Power down the unit and remove power from the power supplies.

Step 3 Loosen the Phillips head screw on the module faceplate, and then pull out the module by gripping the screw.

Install a Cisco Catalyst Pluggable Interface Module

To install a PIM, perform these steps:

Procedure

Step 1 Read the Safety Warnings before you perform any task.

Step 2 Power down the unit and remove power from the power supplies.

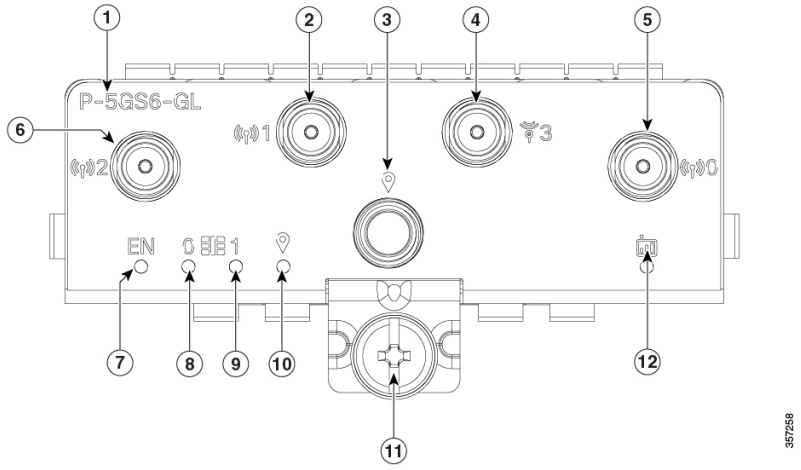
Step 3 If there is a filler faceplate blank in the PIM slot, loosen the Phillips head screw and remove the blank.

Step 4 Push the module into the slot until you feel the edge connector seat into the connector on the backplane. The module faceplate should contact the chassis panel.

Step 5 Tighten the Phillips head screw on the module faceplate.

Step 6 The device may now be powered on.

Figure 33: 5G Pluggable Interface Module - P-5GS6-GL



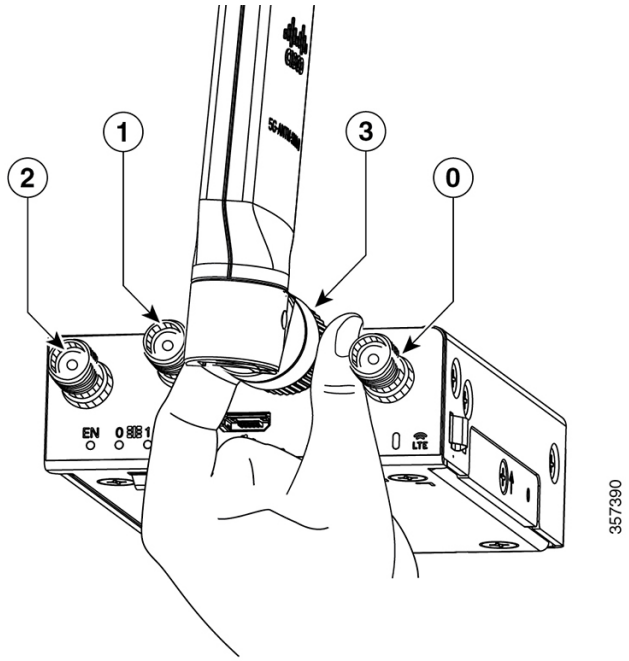
1	PID
2	Antenna 1 (SMA)

3	GPS (SMA)
4	Antenna 3 (SMA, reception only)
5	Antenna 0 (SMA)
6	Antenna 2 (SMA)
7	Enable LED
8	SIM 0 LED
9	SIM 1 LED
10	GPS LED
11	M3.5 thumb-screw
12	Service LED

Configuring a Pluggable Interface Module

To insert the antenna in the Pluggable Interface Module, perform the below steps:

Figure 34: Attaching the Antennas



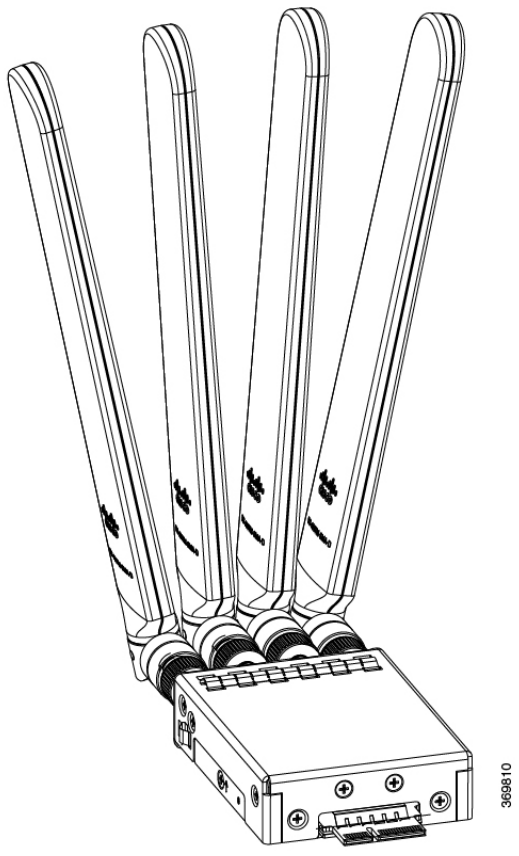
Procedure

Step 1 Use your thumb and index finger to insert and tighten antenna 1 and antenna 3 in the middle antenna attachment slots as indicated in the figure.

Note
While installing the antennas, first install antenna 1 and antenna 3 (this instruction is for the two antenna attachments present in the middle) and secure it completely. If you install antenna 2 and antenna 0 first (this refers to the first and the last antenna attachments), there will be less space to insert your thumb and index finger and therefore you may not be able to secure antenna 1 and 3.

Step 2 Insert antenna 2 and antenna 0 in the first and last antenna attachment slots.

Step 3 After installing the antennas, adjust the antenna orientation by spacing out each of them equally until they are spread out. This is important as it helps in getting higher RF performance.



RF Band Mapping for Antenna Ports (For P-5GS6-GL only)

The following table lists the RF band mapping for antenna ports.

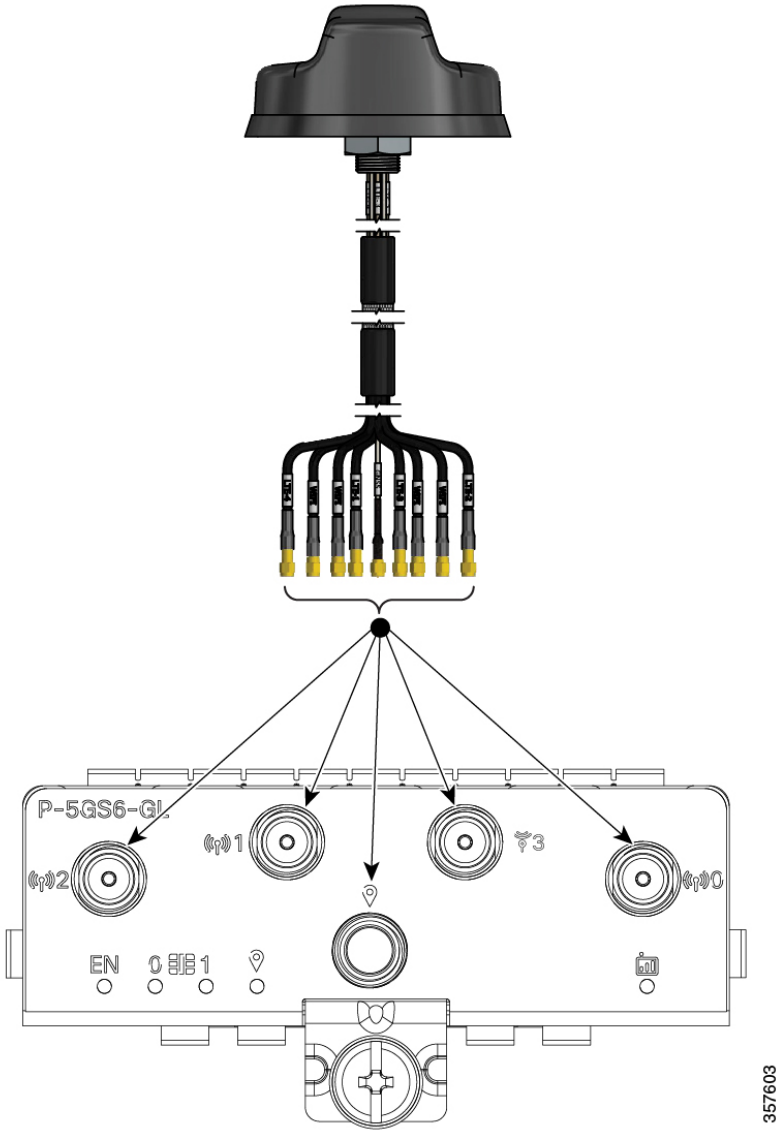
RF Band Mapping for Antenna Ports:

Antenna Port	Technology	TX	RX
ANT 0	3G WDCMA	B1, B2, B3, B4, B5, B6, B8, B9, B19	B1, B2, B3, B4, B5, B6, B8, B9, B19
	LTE	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B30, B34, B38, B39, B40, B41, B66, B71	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B34, B38, B39, B40, B41, B42, B43, B46, B48, B66, B71
	5G NR FR1	n1, n2, n3, n5, n7, n8, n12, n20, n28, n38, n40, n41, n66, n71	n1, n2, n3, n5, n7, n8, n12, n20, n25, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79
ANT 1	3G WDCMA	-	B1, B2, B3, B4, B5, B6, B8, B9, B19
	LTE	B5, B20, B42, B43, B48, B71	B1, B2, B3, B4, B5, B7, B8, B12, B13, B14, B17, B18, B19, B20, B25, B26, B28, B29, B30, B32, B34, B38, B39, B40, B41, B42, B43, B46, B48, B66, B71
	5G NR FR1	n5, n48, n77, n78, n79	n1, n2, n3, n5, n7, n8, n12, n20, n25, n28, n38, n40, n41, n48, n66, n71, n77, n78, n79
ANT 2	3G WDCMA	-	-
	LTE	B1, B2, B3, B4, B7, B41, B66	B1, B2, B3, B4, B7, B25, B30, B32, B34, B38, B39, B40, B41, B42, B43, B46, B48, B66
	5G NR FR1	n1, n2, n3, n7, n25, n41, n66, n77, n78, n79	n1, n2, n3, n7, n25, n38, n40, n41, n48, n66, n77, n78, n79
ANT 3	3G WDCMA	-	-
	LTE	-	B1, B2, B3, B4, B7, B25, B30, B32, B34, B38, B39, B40, B41, B42, B43, B46, B48, B66
	5G NR FR1	-	n1, n2, n3, n7, n25, n38, n40, n41, n48, n66, n77, n78, n79

Attaching the Antennas

To attach the antenna in the Pluggable Interface Module, perform the below steps:

Figure 35: Attaching 5G NR Antenna (5G-ANTM-04-B) to P-5GS6-GL PIM



Note 5G NR Antenna (5G-ANTM-04-B) is supported on both P-LTEAP18-GL and P-5GS6-GL PIMs.

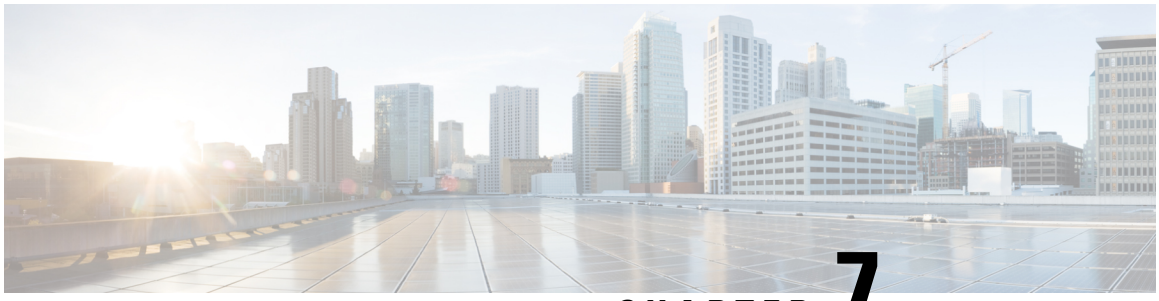
1. Attach each SMA cable to the ports as indicated in the table mappings.
2. Ensure that you tighten and secure each SMA cable into the SMA connector on the PIM.

Table 7: Port Mappings for 5G-ANTM-0-4-B on P-5GS6-GL and P-LTEAP18-GL PIMs

5G-ANTM-O-4-B	P-LTEAP18-GL	P-5GS6-GL
MAIN 0 (LTE1)	Main 0	ANT 0
MAIN 1 (LTE3)	Main 1	ANT 1
DIV 0 (LTE2)	DIV 0	ANT 2
DIV 1 (LTE4)	DIV 1	ANT 3
GNSS	No connection	GPS

The following link contains the antenna specifications and installation instructions for 5G NR (5G-ANTM-O-4-B):

https://www.cisco.com/c/en/us/td/docs/routers/connectedgrid/antennas/installing-combined/b-cisco-industrial-routers-and-industrial-wireless-access-points-antenna-guide/m-5g-antm-04b.html#Cisco_Generic_Topic.dita_e780a6fe-fa46-4a00-bd9d-1c6a98b7bcb9



CHAPTER 7

Online Insertion and Removal and Hot-Swapping

The online insertion and removal (OIR) operation lets you replace faulty data and voice modules without affecting system operations. The OIR is similar to hot-swapping. OIR commands are issued before removing and after installing a module. When performing OIR, use an identical module to replace an original one. If you need to perform the OIR operation on multiple modules within a router, perform the operation one module at a time.

The difference between hot-swapping and OIR is that OIR requires executing Cisco IOS commands before and after the OIR. Hot-swapping is strictly a hardware function and does not require the execution commands. Not all router components or modules use OIR, or can be hot swapped.

The following components use OIR in the routers:

- Network Interface Modules (NIMs)
- SFPs
- USB devices

Note The M.2 USB/NVMe module cannot be hot-swapped. The router must be powered off if the M.2 USB/NVMe module is to be removed or installed.

Requirement

To issue OIR commands, you must keep the module that is to be replaced in EnergyWise full-power mode. If the module is in EnergyWise power-saving or shutdown mode, you cannot issue OIR commands, and you cannot, therefore, remove the module.

• OIR Procedures, on page 69

OIR Procedures

The following procedures describe using the OIR process to remove and replace NIMs and SMs.

Remove a Module

From a console terminal run the **hw-module subslot subslot stop** command. The service module adapter LED blinks, turns off, and the console displays a prompt signaling the module can be removed. See the following output:

```
Device# hw-module subslot 2/0 stop
Proceed with stop of module? [confirm]
damo-O2#
*Mar 22 20:43:31.088: %SPA_OIR-6-OFFLINECARD: SPA (SM-X-1T3/E3) offline in subslot 2/0
*Mar 22 20:43:31.088: %IOSXE_OIR-6-SOFT_STOPSPA: SPA(SM-X-1T3/E3) stopped in subslot 2/0,
interfaces disabled
Device# show hw-module subslot 2/0 oir
Module Model Operational Status
------------ -------------------- ------------------------
subslot 2/0 SM-X-1T3/E3 stopped
```

Insert a Module

You require to run this step only if you run the oir-stop command when the module is not physically removed from the slot. If the module is physically removed, you do not require to run this command.

From a console terminal issue the hw-module sm {slot} oir-start command. The console displays output that shows the module change states:

```
Device# hw-module sm 2 oir-start
Device#
*Nov 11 21:06:17.546: %ATMOC3POM-6-SFP_IN: Interface ATM2/0 OC3 MM SFP has been inserted.
Router#
*Nov 11 21:06:19.442: %LINK-3-UPDOWN: Interface ATM2/0, changed state to up
*Nov 11 21:06:20.442: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM2/0, changed state
 to up
```