Cisco C9550 Series Smart Switches Hardware Installation Guide

Cisco C9550 Series Smart Switches
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1 Introduction to Cisco C9550 Series Smart Switches

Topics:

- Switch models
- Front-panel components
- Rear-panel components

Provides a brief introduction to Cisco C9550 Series Smart switches.

The Cisco C9550 Series Smart switches are fixed switches based on Cisco Silicon One ASIC architecture.

The Cisco C9550 series have 1RU and 2 RU switches. These switches provide fixed enterprise core and aggregation switching for enterprise networks that span campuses, branch, and cloud environments. The C9550 Series Smart Switches support secure connectivity for distributed users, diverse device types, and applications, deployed across on-premises and cloud infrastructure.

Switch models

Provides detailed information about each switch model of the C9550 Series Smart switches.

The Cisco C9550 Series Smart switch models are of two types.

- 1RU models
  - C9550-24L4CD
  - C9550-48L4CD
- 2RU models
  - C9550-96L4D

This section provides information about the different stock keeping units (SKUs) of Cisco C9550 Series Smart switches.

Table 1: Cisco C9550 series switches models and descriptions

Switch model	Description
C9550-24L4CD	• 24 x 50/25/10/1G as downlink ports • 4 x QSFP-DD ports that can support 40G/100G/400G • 2 power supply slots • 5 fan trays • Optional SSD storage of up to 960 GB capacity
C9550-48L4CD	• 48 x 50/25/10/1G as downlink ports • 4 x QSFP-DD ports that can support 40G/100G/400G • 2 power supply slots • 5 fan trays • Optional SSD storage of up to 960 GB capacity
C9550-96L4D	• 96 x SFP56 ports of 50/25/10/1G as downlink ports • 4 x QSFP-DD ports that can support 40G/100G/400G • 2 power supply slots • 3 fan trays • Optional SSD storage of up to 960 GB capacity

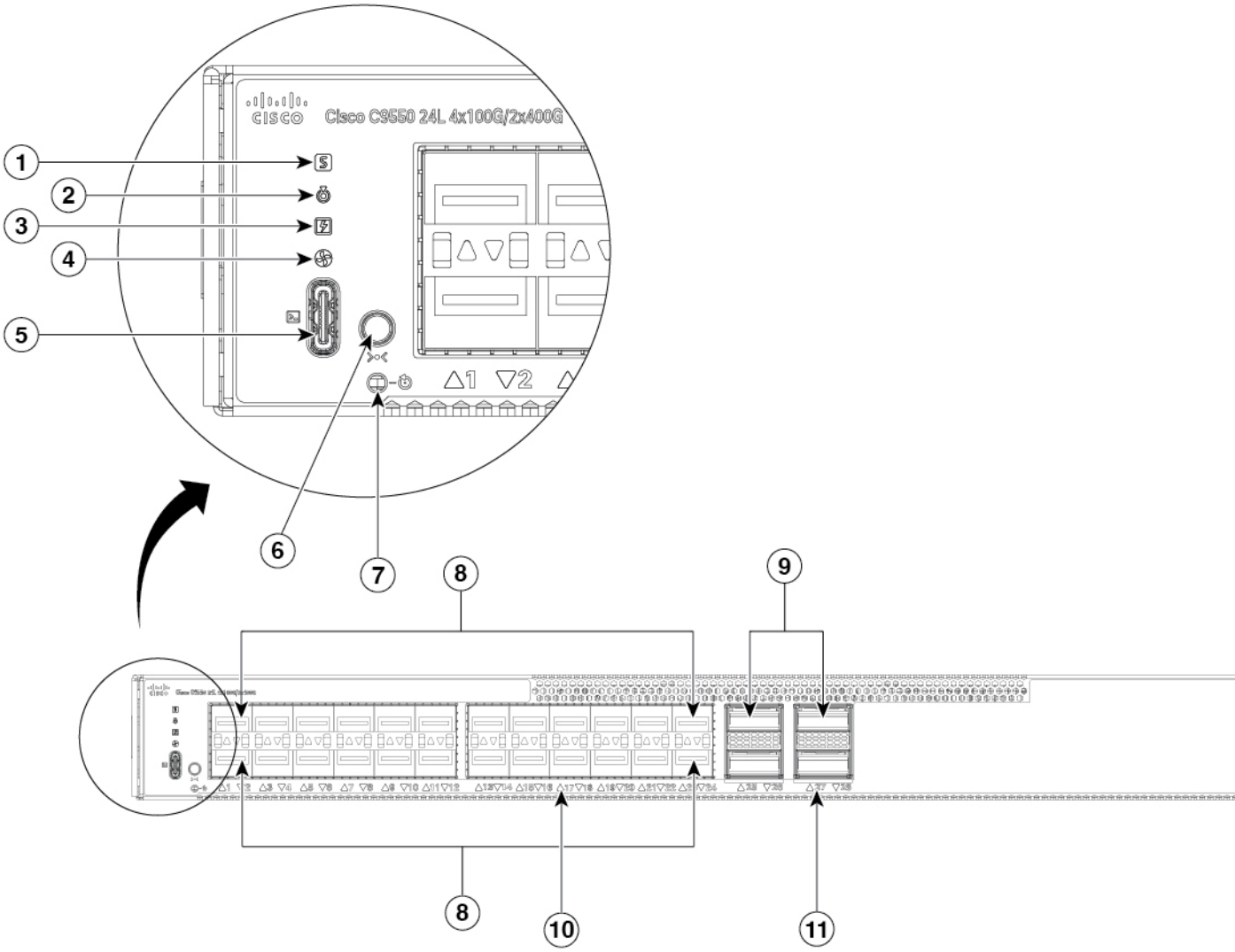
Front-panel components

Describes the front-panel components of the various SKUs of C9550 Series Smart switches.

This section describes the front-panel components of the Cisco C9550 Series Smart switches. All the switch models have similar components.

This illustration displays the front-panel of C9550-24L4CD.

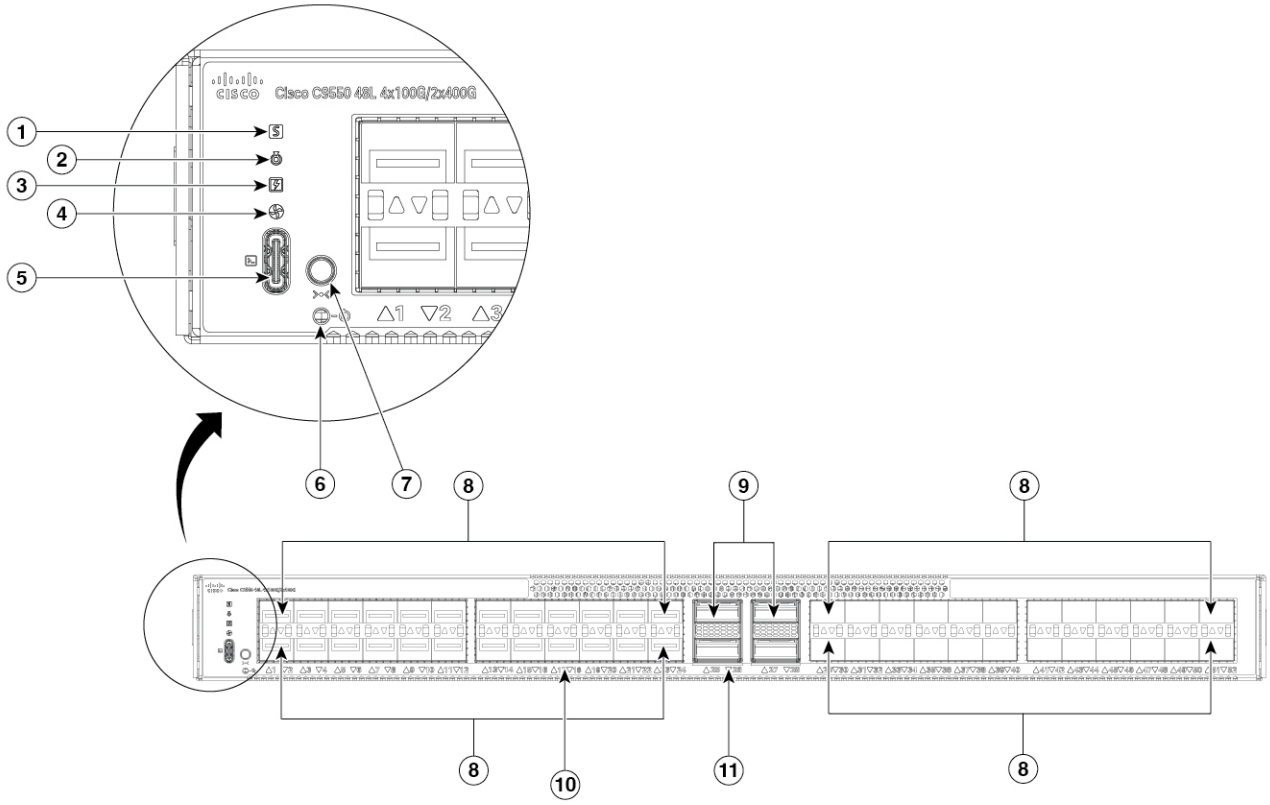
Figure 1: Front-panel of C9550-24L4CD



1	Status LED	7	Reset button
2	Blue beacon	8	24 x SFP ports
3	Power supply LED	9	4 x QSFP-DD ports
4	Fan LED	10	Downlink SFP port LEDs
5	USB-C console port	11	QSFP-DD port LEDs
6	Mode button	-	-

This illustration displays the front-panel of C9550-48L4CD.

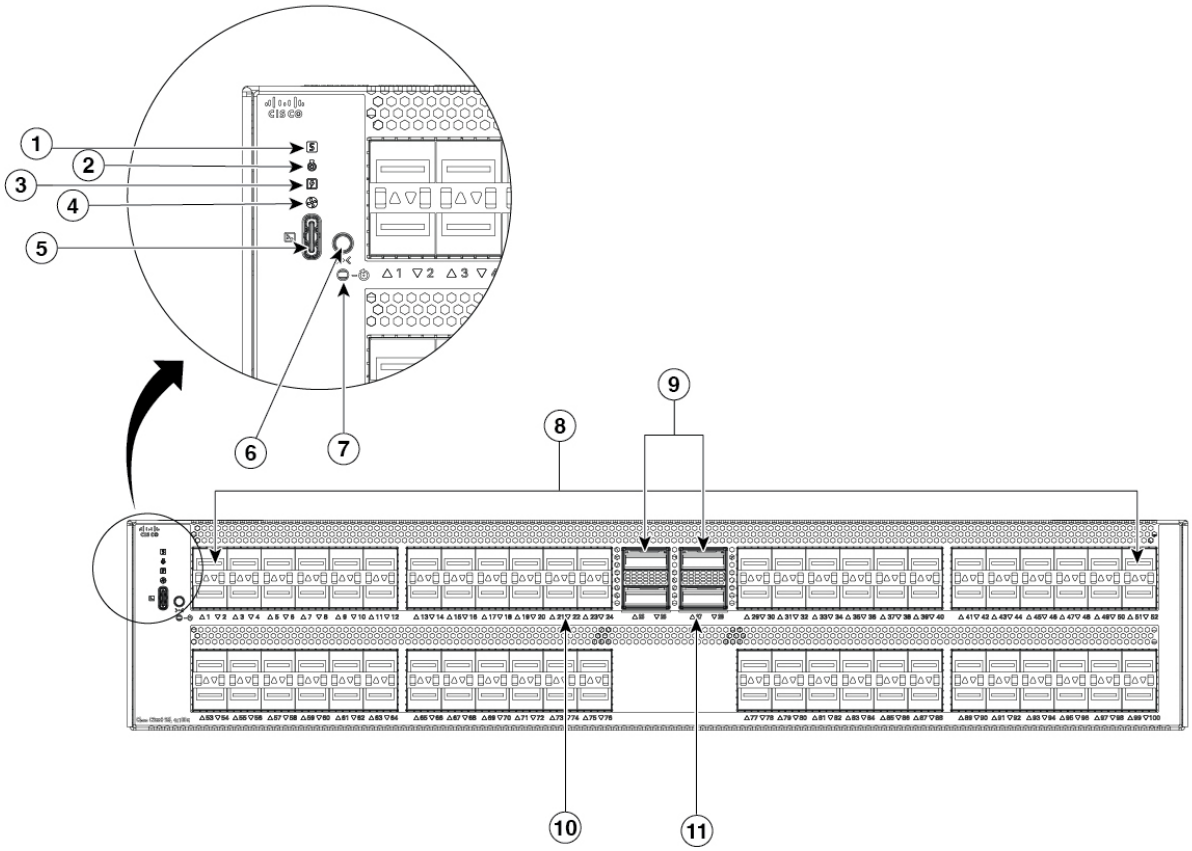
Figure 2: Front-panel of C9550-48L4CD



1	Status LED	7	Mode button
2	Blue beacon	8	48 x SFP ports
3	Power supply LED	9	4 x QSFP-DD ports
4	Fan LED	10	Downlink SFP port LEDs
5	USB-C console port	11	QSFP-DD port LEDs
6	Reset button	-	-

This illustration displays the front-panel of C9550-96L4D.

Figure 3: Front-panel of C9550-96L4D



1	Status LED	7	Reset button
2	Blue beacon	8	96 x SFP ports
3	Power supply LED	9	4 x QSFP-DD ports
4	Fan LED	10	Downlink SFP port LEDs
5	USB-C console port	11	QSFP-DD port LEDs
6	Mode button	-	-

1PPS (I/O) DIN port

Explains the 1PPS (I/O) DIN connector port.

The 1PPS (I/O) DIN connector is an interface that inputs or outputs a One Pulse Per Second (1PPS) timing signal for precise time synchronization, using a DIN-style 1.0/2.3 coaxial connector typically with 50-ohm impedance.

10MHz (I/O) DIN port

Describes the 10 Megahertz (I/O) DIN port.

A 10MHz (I/O) DIN connector is an interface port used for precise frequency synchronization in networking equipment. This port can be configured as input ports from an external clocking and timing source, like GPS. It can also be configured as an output port for testing purposes.

LEDs

Describes the various LEDs available in the front and rear panels of the switch.

You can use the switch LEDs to monitor switch activity and its performance.

Beacon LEDs

Describes the beacon LEDs.

The UID and the Beacon LED can be enabled by the administrator to indicate that the switch needs attention. It helps the administrator identify the switch.

There are two blue beacons—one on the front panel and one on the rear panel of the switch. The blue beacon on the front panel is an LED labeled UID, and on the back panel it is a LED labeled BEACON. The beacon can be enabled by either pressing the UID button on the switch front panel, or by using the CLI.

LED color	Description
Off	The module does not need any attention.
 Flashing Blue	The module requires attention. Provisioned by the administrator of the system.

Ethernet management port LEDs

Provides information about the Ethernet management port LEDs.

This section describes the colors and the descriptions of the LEDs for link activity and link status of the Ethernet management port.

Table 2: Ethernet management port link activity LED

LED color	Description
Off	Link is down.
 Green	Link is up.

Table 3: Ethernet management port link status LED

LED color	Description
Off	Link is down.
 Green	Link is up.

Port LEDs and modes

Describes the port LED modes and colors.

Each SFP and QSFP module slot has a port LED. These port LEDs, as a group or individually, display information about the switch and the individual ports. The port mode determines the type of information shown by the port LEDs.

To select or change a mode, press the mode button until the desired mode is highlighted. When you change port modes, the meanings of the port LED colors also change.

Table 4: Description of switch LED colors in different modes

Port mode	Port LED color	Meaning
STAT (port status)	Off	No link, or port was administratively shut down.
	 Green	Link present, no activity.
	 Blinking green	Activity. Port is sending or receiving data.
	Alternating green-amber	Link fault. Error frames can affect connectivity, and errors such as excessive collisions, CRC errors, and alignment and jabber errors are monitored for a link-fault indication.
	 Amber	Interface is blocked by Spanning Tree Protocol (STP) and is not forwarding data. BLINKING AMBER - When there errors in the interfaces. Like collision error, FCS, RCV Err.
	 Blinking amber	Error in the interface. Errors can be collision, FCS (Frame Check Sequence), or RCV (Receive) errors.

System LEDs

Describes the system LEDs.

This section describes the system LEDs on Cisco C9550 Series Smart switches.

Color	System status
Off	System is not powered on.
 Green	System is operating normally.
 Amber	System is receiving power but is not functioning properly. The failure is because of • fan failure, • system POST failure, or • minor environmental alarm.

Color	System status
 Red	System has triggered a major environmental alarm due to failed diagnostic tests or hardware failures.

Management port

Describes the Ethernet management port on Cisco C9550 switches.

The switch supports an Ethernet management port, also referred to as the Gi0/0 or GigabitEthernet0/0 port, This port is a Virtual Routing and Forwarding (VRF) interface to which you connect a PC. It supports TFTP for image downloading, SFTP for secure image downloading, network management, SNMP, Telnet, and SSH connections.

The switches support out-of-band (OOB) management through the Mgmt-vrf. The Mgmt-vrf is used to segment management traffic from the global routing table of the switch. The Ethernet management port supports speeds up to 10/100/1000 Mbps and is set to auto-negotiate.

When managing a switch, connect the PC to the management port of the switch.

Optional RFID

Describes the RFID on Cisco C9550 Smart Switches.

This chassis has an optional built-in, front-facing, passive Radio Frequency Identification (RFID) tag that uses Ultra High Frequency (UHF) RFID technology and requires an RFID reader with compatible software. It provides auto-identification capabilities for asset management and tracking. The RFID tags are compatible with the Generation 2 GS1 EPC Global Standard and are ISO 18000-6C compliant. They operate in the 860- to 960-MHz UHF band. For more information, see Radio Frequency Identification (RFID) on Cisco Catalyst 9000 Family Switches White Paper.

For Cisco C9550 Series Smart Switches, the **RFID tag is optional**. Based on your requirements, you can choose to order the switch with or without an RFID tag at the time of purchase through the PID.

Reset button

Describes the reset button on the front panel of the switch.

A recessed access button is available on the front panel of the C9550 Series Smart switches to reset and restart the module. Using a pin, press and hold the button inwards for 5 seconds to reset and restart the module.

SFP and QSFP module ports

Describes the SFP and QSFP module ports on Cisco C9550.

Small Form-Factor Pluggable (SFP) ports are slots that accommodate SFP transceiver modules. These ports connect network equipment using either fiber optic or copper cabling, depending on the type of SFP module.

Quad Small Form-Factor Pluggable (QSFP) ports are high-speed, high-density network interfaces that accommodate QSFP transceiver modules. These ports are primarily used for data center, enterprise, and service provider environments where large amounts of data need to be transmitted quickly and efficiently. QSFP+ ports support data rates upto 40G.

QSFP-double density (DD) ports offer double the high-speed electrical interfaces as QSFP28 while maintaining the same port density. When combined with higher transmission rates per electrical interface (28G to 56G to 112G), QSFP-DD optical transceivers can increase 100G data rates to 400G.

TOD PTP RJ-45 port

Explains the time-of-day RJ-45 port.

A standard Cisco Time-of-Day (ToD) RJ-45 port—used for GPS and network synchronization—typically utilizes an RS-422 signal interface to send or receive clock and 1PPS (Pulse Per Second) signals.

TOD refers to a time source or time-stamping capability available at the hardware or system level for precise timekeeping. It may be used in conjunction with the Precision Time Protocol (PTP) to obtain and distribute the exact time-of-day information across devices.

USB Type C ports

Describes the USB-C port and how it works on C9550 switches.

- The USB-C console port
  - Serves as a serial console interface for device management.
  - Connects a computer or terminal directly to the Cisco device for configuration purposes.
  - Enables terminal communication to configure routers, switches, firewalls, or other Cisco network devices.

The USB console takes precedence over the RJ-45 console. When a cable is connected to the USB console port, the RJ-45 console port becomes inactive, and when the USB cable is disconnected from the USB console port, the RJ-45 port becomes active.

You can configure an inactivity timeout, which reactivates the RJ-45 console if the USB console has been activated and no activity has occurred on the console for a specified amount of time.

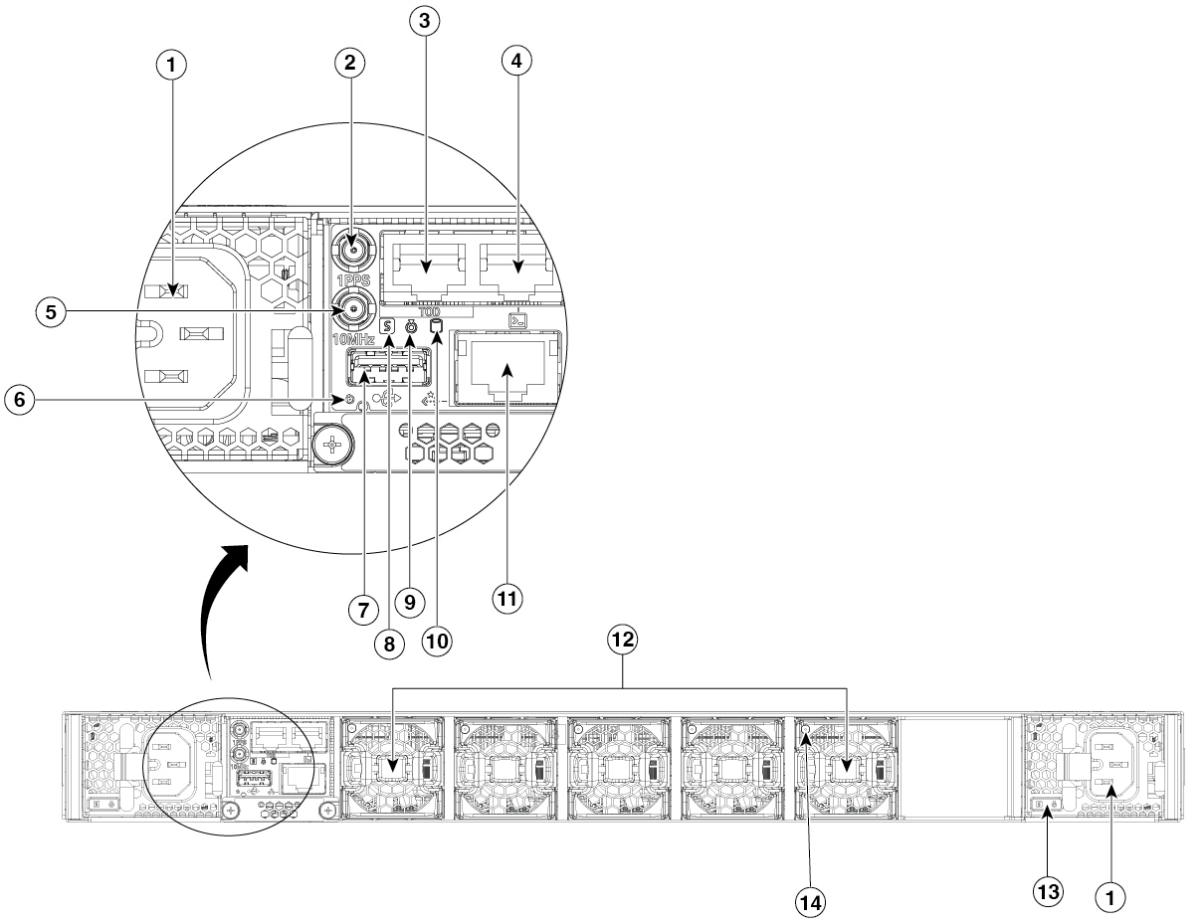
After the USB console deactivates due to inactivity, you must disconnect and reconnect the USB cable to reactivate the USB console.

Rear-panel components

Describes the rear-panel components of C9550 Series Smart switches.

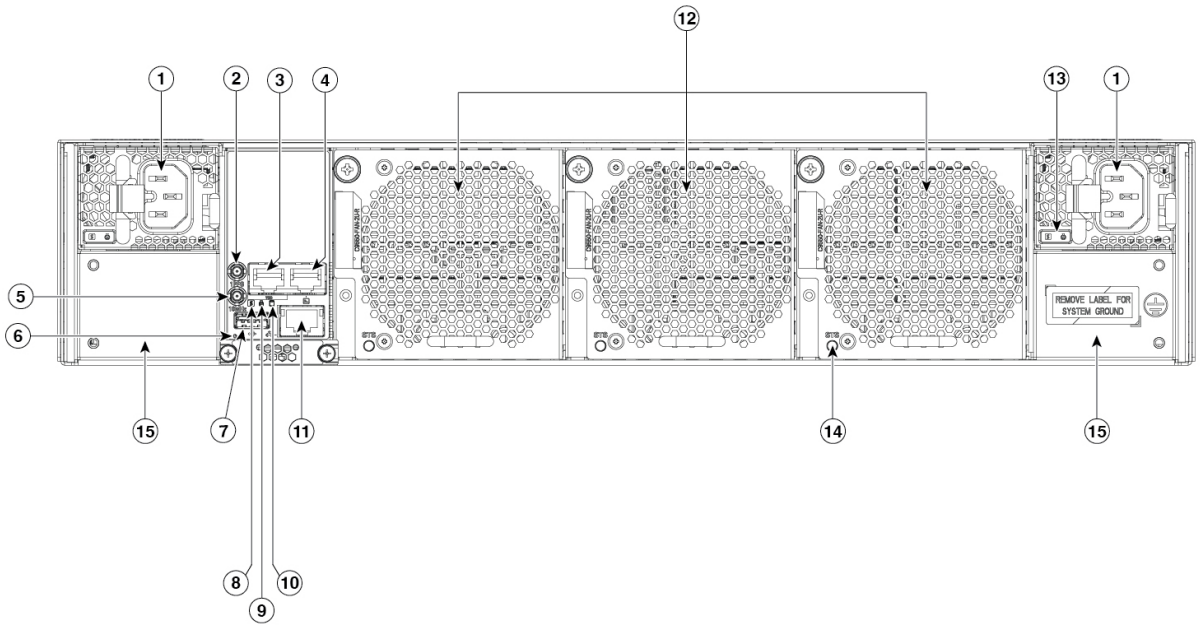
The rear panel of C9550 Series Smart switches include fans and power supply modules.

Figure 4: Rear panel of C9550-24L4CD, C9550-48L4CD



1	Power supply units (PSUs) When viewed from the rear, PSU0 is on the right side and PSU1 on the left side.	7	Status LED
2	1PPS (I/O) DIN port	8	Blue beacon
3	TOD PTP RJ-45 port	9	M2 SSD LED
4	RJ-45 console port	10	RJ-45 management port
5	10MHz (I/O) DIN port	11	Fan tray assembly When viewed from the rear, fans are numbered from right to left and starts from 1. 0 is reserved for the blank slot.
6	USB 3.0 port	12	Power supply LEDs

Figure 5: Rear panel of C9550-96L4D



1	Power supply units (PSUs) When viewed from the rear, PSU0 is on the right side and PSU1 on the left side.	8	Fan tray assembly When viewed from the rear, fans are numbered from right to left and starts from 1. 0 is reserved for the blank slot.
2	1PPS (I/O) DIN port	9	PSU LEDs
3	Status LED	10	10MHz (I/O) DIN port
4	Blue beacon	11	Location for attaching system ground
5	M2 SSD LED	12	USB 3.0 port
6	TOD PTP RJ-45 port	13	RJ-45 management port
7	RJ-45 console port	14	Fan LED

Fan modules

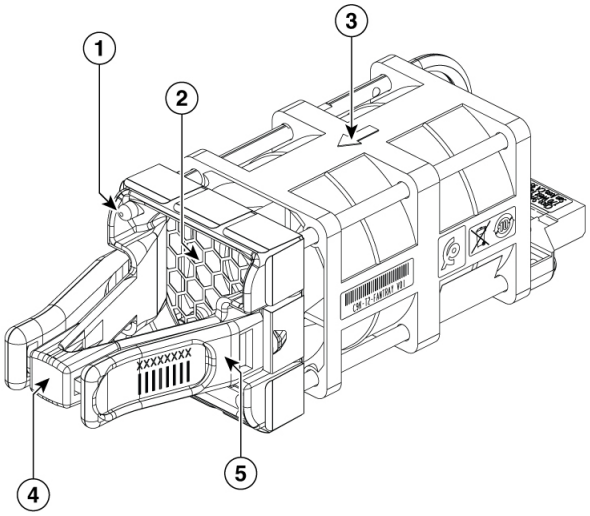
Describes C9550-FAN-1U and C9550-FAN-2U fans used by the different SKUs of C9550 Series Smart switches.

The Cisco C9550 Series Smart switches have fan modules at the rear of the switch. The fans are hot-swappable and numbered from right to left.

The 1RU models of the C9550 Series Smart switches support five 22,000 or 30,000 rpm fan modules and 2RU models support three 15,000 rpm fan modules. These fan tray units support N+1 redundancy and are field-replaceable. The minimum number of fans required for the switch to operate is four for 1RU models and two for 2RU models.

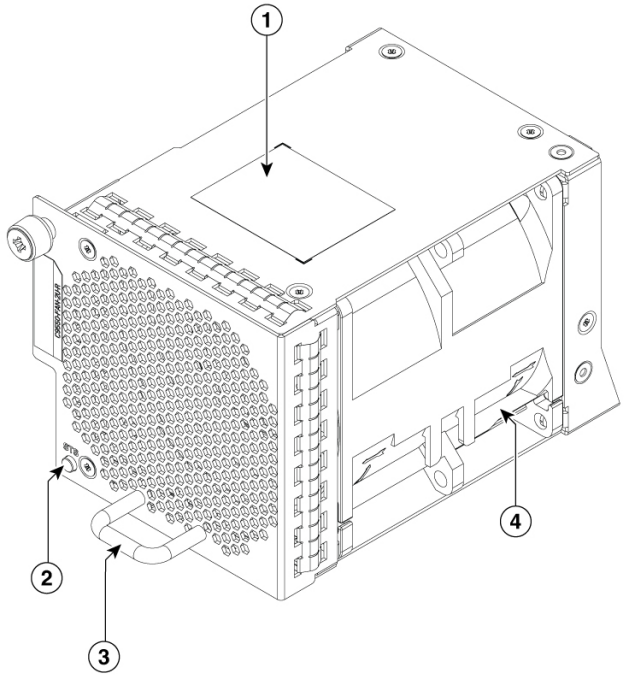
This section describes the different types of fan modules that the different SKUs of C9550 use.

Figure 6: C9550-FAN-1U



1	Fan LED	4	Extraction handle
2	Exhaust vent	5	Retainer clip
3	Airflow direction		

Figure 7: C9550-FAN-2U



1	C9550-FAN-2U	3	Extraction handle
2	Fan LED	4	Retainer clip

1RU models of C9550 Series Smart switches support C9550-FAN-1U fans, and 2RU models support C9550-FAN-2U fans.

C9550-FAN-1U-F and C9550-FAN-2U-F fans with the blue handle support port-side exhaust. C9550-FAN-1U-R and C9550-FAN-2U-R fans with the burgundy handle support port-side intake. You can chose direction of the airflow; either port-side intake or port-side exhaust. All fans must be of the same type, and a mix of the two types of fans is not supported.

Table 5: Switch models and supported fan models

Switch model	Number of fans	Fan model
C9550-24L4CD	5 x 40x40 mm fan trays	• C9550-FAN-1U-F: port-side exhaust (blue handle) • C9550-FAN-1U-R: port-side intake (burgundy handle)
C9550-48L4CD	5 x 40x40 mm fan trays	
C9550-96L4D	3 x 80x80 mm fan trays	• C9550-FAN-2U-F: port-side exhaust (blue handle) • C9550-FAN-2U-R: port-side intake (burgundy handle)

Warning

Statement 1093—Avoid Sharp Edges

Risk of personal injury. Avoid sharp edges when installing or removing replaceable units.



Fan LEDs

Describes the fan tray LEDs and their status.

This section describes the fan LED colors on Cisco C9550 switches.

Color	Description
Off	The fan trays are not receiving power; the fans are not working.
Green	All fans are operating normally.
Amber	One or more fans have encountered tachometer faults.
Red	Tachometer faults in one or more fans have exceeded the maximum limit.
Blue	Blue beacon LED to indicate the slot or location of the fan that requires attention.

Power supply modules

Describes the different types of power supply modules that Cisco C9550 switches support.

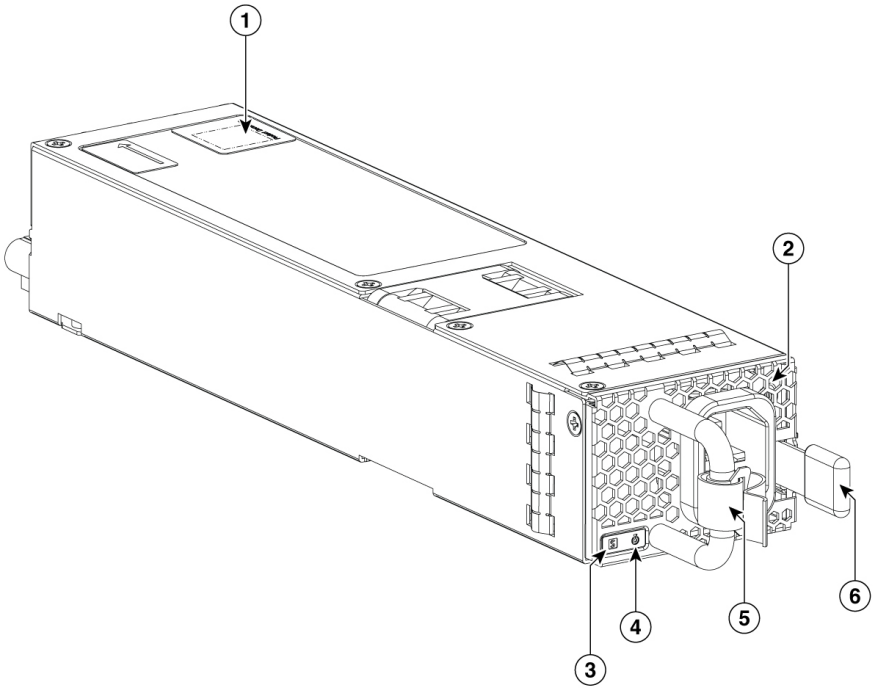
An internal power supply module converts external electrical power (either AC or DC) into the precise DC voltages required to operate the switch's internal components.

The Cisco C9550 Series Smart switches have two internal power supply module slots and support 1+1 power supply redundancy. You can use either one or two power supply modules. By default, these switches ship with one power supply module, and you can purchase more power supply modules when you order the switch or at a later date. The power supply modules are numbered 0 to 1, from left to right. All empty power supply module slots must be filled with a blank module.

Each AC power supply module has a power cord for connection to an AC power outlet. To view the list of available AC power cords, see the section.

This section displays the supported power supply modules and the components of each of these.

Figure 8: 750W and 1100W power supply module



1	Serial number location	4	Blue beacon
2	Air vent	5	AC power cord connector
3	Status LED	6	Extraction handle

The following table describes the supported internal power supply modules.

Table 6: Power supply module part numbers and descriptions

Power supply module	Description
C9K-PWR-750WAC	750W AC Titanium-certified power supply module with port-side exhaust fan

Power supply module	Description
C9K-PWR-1100WAC	1100W AC Titanium-certified power supply module with port-side exhaust fan
C9K-PWR-1100WDC	1100W DC Titanium-certified power supply module with port-side exhaust fan

These power supply modules work with fans that have port-side intake (burgundy color) and port-side exhaust (blue color) air flow.

Default power supply

Lists the default power supply module shipped with each PID and the supported power supply combinations.

All switches ship with a default power supply module. All the power supply modules (except the blank modules) have internal fans.

> **Caution**
>
> Do not operate the switch with one power supply module slot empty. Always install a blank module in the empty slot to keep the operating temperature and fan noise lower.

This table displays the default power supply module that ships with each switch model.

Table 7: Supported default power supply

Switch model	Default power supply
C9550-24L4CD	C9K-PWR-750WAC
C9550-48L4CD	C9K-PWR-750WAC
C9550-96L4D	C9K-PWR-1100WAC

Power supply configurations

This section lists the supported power supply combinations for each PID.

Switch model	Supported power supply configuration
C9550-24L4CD	• 750W AC + 750W AC
C9550-48L4CD	• 750W AC + 1100W DC • 1100W DC + 1100W DC
C9550-96L4D	• 1100W AC + 1100W AC • 1100W AC + 1100W DC • 1100W DC + 1100W DC

Power supply LEDs

Describes the power supply LED colors and their status.

This section describes the LED indicators when two power supplies modules are installed in the switch

Table 8: Power supply module LEDs

LED color	Description
Off	Power supply modules are not working. • All power supply modules have failed. • Power supply modules are not connected to the AC input. • Power supply modules are not installed.
 Green	Power supply modules are operating normally.
 1Hz Green Blinking	Bootloading mode.
 Amber	Power supply warning. The power supply modules are operating in high temperature, high power, and slow fan.
 Red	Power supply failure due to the following issues: • Fan failure • Over voltage • Over current • Over temperature • Output ORING FET fault
 Blue	Indicates the slot or location of the power supply module that requires attention.

M2 SSD module

Describes the M2 SSD port support on Cisco C9550 switches.

The Cisco C9550 Series Smart switches support pluggable Serial Advanced Technology Attachment (SATA) Solid State Drive (SSD) module. The M2 SATA SSD module slot is located on the rear panel of the switch.

The SSD card is a common card, consists of an M2 SSD module and a mechanical carrier. It is a field replaceable unit. Both the 1RU and 2RU switches comes with 240GB capacity SATA SSD.

The SSD module storage capacity ranges are 240GB, 480GB, and 960GB.

The following table lists the M2 SATA modules supported on Cisco C9550 Series Smart switches.

M2 SATA SSD	Description
C9K-F3-SSD-240GB	240GB SATA memory for 1RU SKUs
C9K-F3-SSD-480GB	480GB SATA memory for 1RU SKUs
C9K-F3-SSD-960GB	960GB SATA memory for 1RU SKUs
C9K-F4-SSD-240GB	240GB SATA memory for 2RU SKUs
C9K-F4-SSD-480GB	480GB SATA memory for 2RU SKUs
C9K-F4-SSD-960GB	960GB SATA memory for 2RU SKUs

SSD LEDs

Provides information about the SSD LEDs and their status.

This section describes the SSD LEDs and their status.

LED color	Description
Off	SSD is not installed or no activity.
 Blinking green	SSD is active.
Blinking red	After button presses, FPGA drive RED LED blinking and send IRQ to SW.
 Red	Ready to eject the SSD from the switch.

2 Prepare to Install

Topics:

- Safety
- Network Equipment-Building System (NEBS) Statements
- Site requirements
- Shipping box contents
- Standard and optional accessory kit contents
- Unpack the box

What you must do before you install the Cisco C9550 Series Smart Switches.

Describes the safety warning and checklists to adhere to, the power and cabling requirements, and site preparation before you install Cisco C9550 smart switches.

Safety

The safety guidelines that you must adhere to before you prepare the site for switch installation.

This section provides the safety guidelines that must be followed before you prepare the site for switch installation.

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



Note

Statement 407–Japanese Safety Instruction

You are strongly advised to read the safety instruction before using the product.

https://www.cisco.com/web/JP/techdoc/pldoc/pldoc.html

When installing the product, use the provided or designated connection cables/power cables/AC adapters.

〈製品使用における安全上の注意〉

www.cisco.com/web/JP/techdoc/index.html

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Warning

Statement 1003–DC Power Disconnection

To reduce risk of electric shock or personal injury, disconnect DC power before removing or replacing components or performing upgrades.

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.

Note

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 for AC, 50A for DC.

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

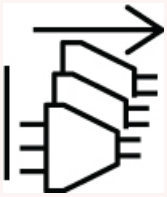
Statement 1024—Ground Conductor

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 1033–Safety Extra-Low Voltage (SELV)–IEC 60950/ES1-IEC 62368 DC Power Supply

To reduce the risk of electric shock, connect the unit *only* to a DC power source that complies with the SELV requirements in the IEC 60950-based safety standards or the ES1 requirements in the IEC 62368-based safety standards.

Warning

Statement 1046–Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

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.

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.

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 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 9001—Product Disposal

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

Network Equipment-Building System (NEBS) Statements

NEBS safety statements when using NEBS racks for mounting the switch.

NEBS describes the environment of a typical United States Regional Bell Operating Company (RBOC) central office. NEBS is the most common set of safety, spatial, and environmental design standards applied to telecommunications equipment in the United States. It is not a legal or regulatory requirement, but rather an industry requirement.

The following NEBS statements apply to the Cisco C9550 Series Smart Switches:

Warning

Statement 7003–Shielded Cable Shielded Cable Requirements for Intrabuilding Lightning Surge

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

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

RJ-45 Management Ethernet Port

Note

Statement 7004–Special Accessories Required to Comply with GR-1089 Emission and Immunity Requirements

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

Copper RJ-45 Ethernet Management port

Warning

Statement 7005–Intrabuilding Lightning Surge and AC Power Fault

The intrabuilding port(s) of the equipment or subassembly must not be metallically connected to interfaces that connect to the outside plant (OSP) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

This statement applies to the intrabuilding ports listed below:

RJ-45 Ethernet Management port

Warning

Statement 7009–Equipment With Integrated Primary Protection (EIPP)

This equipment contains integrated primary protection. This equipment is not suitable for installation in central office (CO) and network locations that contain other primary protection for outside plant (OSP) cables, such as electronic equipment enclosures (EEEs), for example, controlled environmental vaults (CEVs) and huts. The equipment may be located in electronic equipment cabinets (EECs) where appropriate installation practices are used, for example, installation should not employ a separate primary protector for the equipment, appropriate cabling should be run to the equipment, and so forth. For the purposes of determining placement and location of fuse links or fuse cable, treat the equipment as a fuseless protector regardless of any capability it has to provide fusing. This equipment utilizes a listed integral primary protector rated .

Note

Statement 7013–Equipment Grounding Systems–Common Bonding Network (CBN)

This equipment is suitable for installations using the CBN.

Note

Statement 7016–Battery Return Conductor

Treat the battery return conductor of this equipment as DC-I.

Note

Statement 7018–System Recover Time

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

Note

Statement 8015–Installation Location Network Telecommunications Facilities

This equipment is suitable for installation in network telecommunications facilities.

Note

Statement 8016–Installation Location Where the National Electric Code (NEC) Applies

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

Site requirements

How to plan a proper location to install your switch, and the environmental factors that must be taken into consideration before installing your switch.

Planning a proper location for the switch and layout of the equipment rack or wiring closet is essential for successful system operation. These sections describe some of the basic site requirements that you should be aware of as you prepare to install your switch, including the following:

- Environmental factors can adversely affect the performance and longevity of your system.

- Install the switch in an enclosed, secure area, ensuring that only qualified personnel have access to the switch and control of the environment.
- Equipment that is placed too closely together or that is inadequately ventilated may cause system over-temperature conditions, leading to premature component failure.
- Poor equipment placement can make chassis panels inaccessible and difficult to maintain.
- The switch requires a dry, clean, well-ventilated, and air-conditioned environment.
- To ensure normal operation, maintain ambient airflow. If the airflow is blocked or restricted, or if the intake air is too warm, an over-temperature condition may occur. The switch environmental monitor may then shut down the system to protect the system components.
- Multiple switches can be rack mounted with little or no clearance above and below the chassis. However, when mounting a switch in a rack with other equipment, or when placing it on the floor near other equipment, ensure that the exhaust from other equipment does not blow into the air intake vent of the switch chassis.

Air flow

How to maintain proper air circulation through the switch chassis.

A switch is designed to be installed in an environment where there is a sufficient volume of air available to cool the supervisor engines, modules, and power supplies. If there are any constraints with regard to the free flow of air through the chassis, or if the ambient air temperature is elevated, the switch environmental monitor may then shut down the system to protect the system components.

To maintain proper air circulation through the switch chassis, we recommend that you maintain a minimum space of 6 inches (15 cm) between a wall and the chassis and power supply unit air intakes or a wall and the chassis and power supply unit hot air exhausts. In situations where the switch chassis are installed in adjacent racks, you should allow a minimum space of 12 inches (30.5 cm) between the air intake of one chassis and the hot air exhaust of another chassis. Failure to maintain adequate spacing between chassis may cause the switch chassis that is drawing in the hot exhaust air to overheat and fail.

If you are installing your switch in an enclosed or partially enclosed rack, we strongly recommend that you verify that your site meets the following guidelines:

- Verify that the ambient air temperature within the enclosed or partially enclosed rack is within the chassis operating temperature limits. After installing the chassis in the rack, power up the chassis and allow the chassis temperature to stabilize (approximately 2 hours).

  Measure the ambient air temperature at the chassis air intake grill by positioning an external temperature probe 1 inch (2.5 cm) away from the chassis left side, and centered on the chassis both horizontally and vertically.

  Measure the ambient air temperature at the power supply unit air intake grill by positioning an external temperature probe 1 inch (2.5 cm) away from the chassis front, centered on the power supply unit section located above the card slots.

  - If you are using 9550-FAN-1U-R or C9550-FAN-2U-R fans, and the ambient intake air temperature is less than 113° F (45° C) at altitudes of 6,000 feet and below, the rack meets the intake air temperature criterion. At altitudes above that threshold and up to 10,000 feet (3000 m), the air intake should not exceed 104° F (40° C).

    If you are using C9550-FAN-1U-F or C9550-FAN-2U-F fans, the air intake should not exceed 95° F (35° C).
  - If the ambient intake air temperature exceeds this recommendation, the system may experience minor temperature alarms and increase fan speeds in response.
  - If the ambient intake air temperature equals or is greater than 113° F (45° C) for C9550-FAN-1U-R and C9550-FAN-2U-R fans, and 95° F (35° C) for C9550-FAN-1U-F and C9550-FAN-2U-F fans, the system may experience a major temperature alarm with maximum fan speeds in response. If ambient temperature continues to increase, system will respond with protective shut down.

- Plan ahead. A switch that is currently installed in an enclosed or partially enclosed rack might meet ambient air temperature and air flow requirements at present. However, if you add more chassis to the rack or more modules to a chassis in the rack, the additional heat generated might cause the ambient air temperature at the chassis or power supply unit inlets to exceed recommended conditions which may trigger thermal alarms.

  If installation conditions for inlet temperature and airflow are marginal or not fully met, activate the fan tray's NEBS mode, which has more aggressive programming to address restricted spacing and elevated ambient temperatures. This should result in reduced thermal alarms along with greater acoustic noise and increased power consumption associated with higher fan speeds.

Air quality

How to maintain air quality, and minimize dust from accumulating inside your switch.

Dust is everywhere and often invisible to the naked eye. It consists of fine particles in the air that originate from various sources, such as soil dust lifted by weather, from volcanic eruptions, or pollution. Dust at an installation site may contain small amounts of textile, paper fibers, or minerals from outdoor soil. It may also contain natural contaminants, such as chlorine from the marine environment and industrial contaminants such as sulfur. Ionized dust and debris are dangerous and get attracted to electronic equipment.

The accumulation of dust and debris on electronic equipment has the following adverse effects:

- It increases the operating temperature of the equipment. According to the Arrhenius effect, an increase in the operating temperature leads to a decrease in reliability and life of the equipment.
- The moisture and corrosive elements that are present in the dust can corrode the electronic or mechanical components and cause premature board failure.

These adverse effects are further accelerated by the presence of fans in the data networking equipment that ingest dust and other particles into the equipment. Higher the volume of air that is generated by the fans for cooling, the higher the quantity of dust and particulates that get deposited and trapped inside the equipment. Remove or minimize the presence of dust and particulates at the installation site by following the guidelines mentioned in ANSI 71-04-2013 regulations.

Note

In addition to the guidelines mentioned in ANSI 71-04-2013 regulations, follow all applicable guidelines as per site conditions to remove or minimize other contaminants.

Altitude

What happens when you operate your switch in high altitudes.

Operating a system at high altitude (low pressure) reduces the efficiency of forced and convection cooling and may result in electrical problems related to arcing and corona effects. This condition may also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

Corrosion

How corrosion damages your switch and how to prevent corrosion.

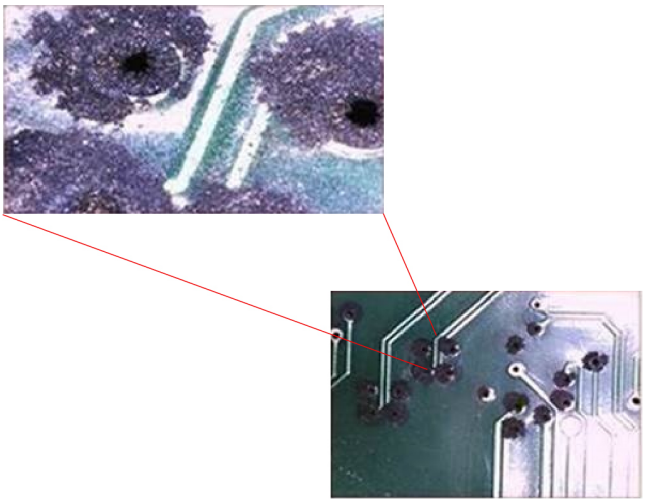
Corrosion is a chemical reaction that occurs between electronic components and gases which results in metal deterioration. Corrosion attacks edge connectors, pin connectors, IC plug-in sockets, wirewraps, and all other metal components. Depending on the type and concentration level of the corrosive gases, performance degradation of the components occurs either rapidly or over a period of time. It also leads to blocked currents, brittle connection points, and overheated

electrical systems. Corrosion by-products form insulating layers on circuits and causes electronic failure, short circuits, pitting, and metal loss.

A type of corrosion known as creep corrosion, that primarily affects PCBA (Printed Circuit Board Assembly) occurs when the PCBA is subjected to a harsh, and sulfur-rich (hydrogen sulfide) end-use environment over a prolonged period of time. The corrosion begins on certain exposed metals, such as copper and silver, and then creeps along the remaining metal surface either causing electrical short circuits or creating holes. Creep corrosion also occurs on electronic components such as resistors and PCBs.

To prevent corrosion, remove or minimize the presence of dust and particulates at the installation site by following the guidelines mentioned in ANSI 71-04-2013 regulations.

Figure 9: A PCB with corrosion on its metal contacts



Dust and particles

How to minimize dust and particulate matter from accumulating inside your switch.

Fans cool power supplies and system components by drawing in room-temperature air and exhausting heated air out through various openings in the chassis. However, fans also ingest dust and other particles, causing contaminant buildup in the system and increased internal chassis temperature. A clean operating environment can greatly reduce the negative effects of dust and other particles, which act as insulators and interfere with the mechanical components in the system.

The standards listed below provide guidelines for acceptable working environments and acceptable levels of suspended particulate matter:

- National Electrical Manufacturers Association (NEMA) Type 1
- International Electrotechnical Commission (IEC) IP-20

Electro-Magnetic and radio frequency interference

How to minimize electro-magnetic and radio frequency interference that can damage your switch.

Electro-Magnetic interference (EMI) and radio frequency interference (RFI) from a system can adversely affect devices such as radio and television (TV) receivers operating near the system. Radio frequencies emanating from a system can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on the system monitor. RFI is defined as any EMI with a frequency above 10 kilohertz (kHz). This type of interference can travel from the system to other devices through the power cable and power source, or through the air in the form of transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of harmful interference emitted by computing equipment. Each system meets these FCC regulations.

To reduce the possibility of EMI and RFI, follow these guidelines.

- Always operate the system with the chassis covers installed.
- Ensure that all chassis slots are covered by a metal filler bracket and that an unused power supply bay has a metal cover plate installed.
- Ensure that the screws on all peripheral cable connectors are securely fastened to their corresponding connectors on the back of the chassis.
- Always use shielded cables with metal connector shells for attaching peripherals to the system.

When wires are run for any significant distance in an electromagnetic field, interference can occur between the field and the signals on the wires. This fact has two implications for the construction of plant wiring.

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

Note

To predict and provide a remedy for strong EMI, consult experts in RFI.

If you use twisted-pair cable in your plant wiring, include a good distribution of grounding conductors to reduce EMI. If you exceed the recommended distances, use a high-quality twisted-pair cable with one ground conductor for each data signal when applicable.

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

Caution

The intra-building ports (Copper-Based Ethernet Ports) of the equipment or subassembly is suitable for connection to inside a building or unexposed wiring or cabling only. If the intra-building ports of the equipment or subassembly is metalically connected to interfaces that connect to the Out Side Plant (OSP) or its wiring, the metallic-connection MUST NOT be more than 6 meters (approximately 20 feet). These interfaces are designed for use as intra-building interfaces only (Type 2, 4, or 4a ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to an OSP wiring system.

Ground the system

Guidelines to ground your switch as part of the install process.

You must install a system ground as part of the chassis installation process. Chassis installations that rely only on the AC third-prong ground are insufficient to adequately ground the systems.

Proper grounding practices ensure that the buildings and the installed equipment within them have low-impedance connections and low-voltage differentials between chassis. When you install a system ground, you reduce or prevent shock hazards, chances of equipment damage due to transients, and the potential for data corruption.

Without proper and complete system grounding, you run the risk of increased component damage due to ESD. Additionally, you have a greatly increased chance of data corruption, system lockup, and frequent system reboot situations by not using a system ground.

Caution

Installations that rely solely on system grounding that uses only an AC third-prong ground run a substantially greater risk of equipment problems and data corruption than those installations that use both the AC third-prong ground and a properly installed system ground.

Warning

Statement 1024—Ground Conductor

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

Warning

Statement 1101—Connected To Grounded Outlet

In the Scandinavian countries (Denmark, Finland, Iceland, Norway, and Sweden) the appliance must be connected to a grounded outlet.

Note

Statement 1101 is applicable to AC units only.

Warning

Statement 1046—Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

Table 9: Grounding practice guidelines

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
	High	

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
Commercial building is subjected to direct lightning strikes. For example, some places in the United States, such as Florida, are prone to more lightning strikes than other areas.		All lightning protection devices must be installed in strict accordance with manufacturer recommendations. Conductors carrying lightning current should be spaced away from power and data lines in accordance with applicable recommendations and building codes. Best grounding practices must be closely followed.
Commercial building is located in an area where lightning storms occur frequently, but is not prone to direct lightning strikes.	High	Best grounding practices must be closely followed.
Commercial building contains a mix of information technology equipment and industrial equipment, such as welding.	Medium to High	Best grounding practices must be closely followed.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment. This installation has a history of malfunction due to electromagnetic noise.	Medium	Best grounding practices must be closely followed. Determine source and cause of noise if possible, and mitigate as closely as possible at the noise source or reduce coupling from the noise source to the victim equipment.
New commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Best grounding practices should be followed as closely as possible. Electromagnetic noise problems are not anticipated, but installing a best-practice grounding system in a new building is often the least expensive route, and the best way to plan for the future.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Best grounding practices should be followed as much as possible. Electromagnetic noise problems are not anticipated, but installing a best-practice grounding system is always recommended.

Note

In all situations, grounding practices must comply with Section 250 of the National Electric Code (NEC) requirements or local laws and regulations. A 6 AWG grounding wire is preferred from the chassis to the rack ground or directly to the common bonding network (CBN). The equipment rack should also be connected to the CBN with a 6 AWG grounding wire.

Note

Grounding lugs must be installed on the location marked on the chassis only.

Note

Always ensure that all of the modules are completely installed and that the captive installation screws are fully tightened. In addition, ensure that all the I/O cables and power cords are properly seated. These practices are normal installation practices and must be followed in all installations.

Humidity

How humidity affects the performance of your switch and guidelines to minimize the humidity at the site.

High-humidity conditions may cause moisture to enter the system, and cause corrosion of internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size.

Extreme moisture buildup inside the system may result in electrical short circuit, which may cause serious damage to the system. Each system is rated for storage and operation in 10 to 95 percent relative humidity, non-condensing with a humidity gradation of 10 percent per hour.

Buildings in which climate is controlled by air-conditioning in the warmer months and by heat during the colder months usually maintain an acceptable level of humidity for system equipment. However, if a system is located in an unusually humid location, a dehumidifier should be used to maintain the humidity within an acceptable range.

Power source interruptions

How to protect against overvoltage, undervoltage, and transients or voltage spikes.

Systems are especially sensitive to variations in voltage supplied by the AC power source. Overvoltage, undervoltage, and transients (or spikes) can erase data from memory or even cause components to fail. To protect against these types of problems, power wiring ground conductors should always be properly grounded. Also, place the system on a dedicated power circuit (rather than sharing a circuit with other heavy electrical equipment). In general, do not allow the system to share a circuit with any of the following:

- Copy machines
- Air conditioners
- Vacuum cleaners
- Space heaters

- Power tools
- Teletype machines
- Laser printers
- Facsimile machines
- Any other motorized equipment

Besides these appliances, the greatest threats to a system's power supply are surges or blackouts that are caused by electrical storms. Whenever possible, turn off the system and peripherals, if any, and unplug them from their power sources during thunderstorms. If a blackout occurs—even a temporary one—while the system is turned on, turn off the system immediately and disconnect it from the electrical outlet. Leaving the system on may cause problems when the power is restored; all other appliances left on in the area may create large voltage spikes that may damage the system.

Prevent ESD damage

Describes how to prevent electrostatic discharge from damaging your switches.

Electrostatic Discharge (ESD) damage can occur when modules or other FRUs are improperly handled, resulting in intermittent or complete failure of the modules or FRUs. Modules consist of printed circuit boards that are fixed in metal carriers. EMI shielding and connectors are integral components of a carrier. Although the metal carrier helps to protect the board from ESD, always use an ESD-grounding strap when handling modules. 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.
- When installing a component, use an available ejector lever to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.
- When removing a component, use an available ejector lever to release the bus connectors from the backplane or midplane.
- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static-shielding container. If you plan to return the component to the factory, immediately place it in a static-shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Never attempt to remove the printed circuit board from the metal carrier.

Maintain safety with electricity

Guidelines to follow when working with electrical equipment.

Follow these guidelines, when working with electrical equipment.

- Do not work alone if potentially hazardous conditions exist anywhere in your work space.
- Never assume that power is disconnected from a circuit; always check the circuit before working on it.

  When the power is switched off, put a lock-box on the circuit, so that no one can accidentally switch it on.
- Look carefully for possible hazards in your work area, such as damp floors, ungrounded power extension cables, frayed or damaged power cords, and missing safety grounds.
- If an electrical accident occurs, proceed as follows:

    - Use extreme caution; do not become a victim yourself.
    - Disconnect power from the system.
    - Seek medical attention, if necessary.

- Use the product within its marked electrical ratings and product usage instructions.
- Install the product in compliance with local and national electrical codes.
- If any of the following conditions occur, contact the Cisco Technical Assistance Center.
    - The power cable or plug is damaged.
    - An object has fallen into the product.
    - The product has been exposed to water or other liquids.
    - The product has been dropped or shows signs of damage.
    - The product does not operate correctly when you follow the operating instructions.
- To prevent electrical shock
    - Use the correct external power source. Operate the product only from the type of power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult a local electrician.
    - Plug all the power cables into properly grounded electrical outlets. These power cables are equipped with three-prong plugs to ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a power cable.
    - Do not modify power cables or plugs yourself. Consult with a licensed electrician or your power company for site modifications. Always follow your local and national wiring codes.
    - Observe power strip ratings. Make sure that the total current rating of all products that are plugged into the power strip does not exceed 80 percent of the power strip rating.

Shock and vibration

Specifies that the switch is compliant with GR-63-core criteria.

The equipment complies with the Earthquake, Office, and Transportation Vibration, and Equipment Handling Criteria of GR-63-CORE.

Temperature

How extreme temperature can reduce the efficiency of your switch, and guidelines to avoid extreme temperature.

Temperature extremes may cause a system to operate at reduced efficiency and cause a variety of problems, including premature aging and failure of chips, and failure of mechanical devices. Extreme temperature fluctuations may also cause chips to become loose in their sockets. Observe the following guidelines:

- Ensure that the chassis has adequate ventilation.
- Do not place the chassis within a closed-in wall unit or on top of cloth, which can act as thermal insulation.
- Do not place the chassis where it will receive direct sunlight, particularly in the afternoon.
- Do not place the chassis next to a heat source of any kind, including heating vents.
- Adequate ventilation is particularly important at high altitudes. Make sure that all the slots and openings on the system remain unobstructed, especially the fan vent on the chassis.

- Clean the installation site at regular intervals to avoid buildup of dust and debris, which may cause a system to overheat.
- If system is exposed to abnormally low temperatures, allow a two hour warm up period, in ambient temperature no lower than 32° F (0 ° C) before turning on.

Failure to observe these guidelines may damage the internal components of the chassis.

Shipping box contents

Lists the contents that ships along with your Cisco C9550 Series Smart switches.

The shipping box contains the model of the switch you ordered and other components needed for installation. Some components are optional, depending on your order.

Note

Verify that you have received these items. If any item is missing or damaged, contact your Cisco representative or reseller for instructions.

Table 10: Shipping box contents

Item	Quantity
Cisco C9550 Series Smart Switch with optional network module[1]	1
10 pan-head 0.625" long screws	4
12 pan-head 0.50" long screws	4
19-inch mounting brackets	2
8 Phillips flat-head 0.312" long screws	8
Cable guides	2
Ground lug	1
M4.0 x 20mm Phillips pan-head screws (Black color)	2
M4.0 x 8mm Phillips pan-head screws	2
Product documentation and compliance document	1
(Optional) AC power cord [2]	1
(Optional) RJ-45 console cable[1]	1
(Optional) USB console cable[1]	1

Standard and optional accessory kit contents

Describes the standard and optional accessory kits that are available with the Cisco C9550 switch.

This section provides information about the standard accessory kit that ships along with the Cisco C9550 Series Smart switches and also the optional accessory kits that are available for ordering separately.

1RU accessory kits

Lists the contents of the standard and optional accessory kits for the C9550 1RU switches.

The standard accessory kit contains the switch you ordered and other components needed for installation. Based on the switch that you have ordered, you will receive the IRU or 2RU accessory kit.

Optional accessory kits must be ordered separately.

Standard accessory kit

Note

Verify that you have received these items. If any item is missing or damaged, contact your Cisco representative or reseller for instructions.

The Cisco C9550 1RU Series Smart Switches ship with a standard accessory kit.

Table 11: 19-inch standard accessory kit

Switch model	Accessory kit part number
Cisco C9550 1RU Series Smart Switch	C9550-1U-ACKT-19I= Cisco C9550 1RU series 19-inch rack mount kit

This table lists the contents of the 1RU standard accessory kit.

Table 12: C9550-1U-ACKT-19I= contents

Item	Quantity
10-32 x 0.625 inch M Phillips screws	4
12-24 x 0.5 inch M Phillips pan-head screws	4
GNLHW, FEET, POLY, BLK, adhesive	4
Cable management guide Fabricated plastic cable management guide	1
M4 x 20 mm Phillips pan-head screws	1
M4 x 6 mm Phillips flat-head screws	12
Rack mount brackets 19 inches Fabricated metal brackets at the front of the rack	2

Optional accessory kits

The optional accessory kit is not shipped with the switch. You must order it separately by using the chassis-specific part number.

Table 13: 23-inch rack mount kit

Switch model	Accessory kit part number
Cisco C9550 1RU Series Smart Switch	C9550-1U-ACKT-23I= Cisco C9550 1RU series 23-inch rack mount kit

This table lists the contents of the 1-RU 23-inch optional rack mount kit.

Table 14: C9550-1U-ACKT-23I= contents

Item	Quantity
Rack mount brackets 23 inches Fabricated metal brackets at the front of the rack	2
M4 x 6 mm Phillips flat-head screws	12
12-24 x 0.5 inch M Phillips pan-head screws	4
10-32 x 0.625 inch M Phillips screws	4

The 1U extension rails and brackets for 4P mount spare (C9550-2U-4PTH-KIT=) is not part of the standard accessory kit. You must order it separately by using the chassis-specific part number.

Table 15: 1U extension rails and brackets for 4P mount

Switch model	Accessory kit part number
Cisco C9550 1RU Series Smart Switch	C9550-1U-4PTH-KIT= Cisco C9550 1RU series extension rails and brackets for 4P mount kit

Table 16: C9550-1U-4PTH-KIT= contents

Item	Quantity
Rack mount bracket guide rails Extension rails	2
Rack mount brackets Fabricated metal brackets at the front of the rack	2
Rack mount brackets 19 inches Fabricated metal brackets at the front of the rack	2
M4 x 6 mm Phillips flat-head screws	24
12-24 x 0.5 inch M Phillips pan-head screws	8

Item	Quantity
10-32 x 0.625 inch M Phillips screws	8

2RU accessory kits

Lists the contents of the standard and optional accessory kits for the C9550 2RU switches.

The standard accessory kit contains the switch you ordered and other components needed for installation. Based on the switch that you have ordered, you will receive the IRU or 2RU accessory kit.

Optional accessory kits must be ordered separately.

Standard accessory kit

Note

Verify that you have received these items. If any item is missing or damaged, contact your Cisco representative or reseller for instructions.

The Cisco C9550 2RU Series Smart Switches ship with a standard accessory kit.

Table 17: 19-inch standard accessory kit

Switch model	Accessory kit part number
Cisco C9550 2RU Series Smart Switch	C9550-2U-ACKT-19I= Cisco C9550 2RU series 19-inch rack mount kit

This table lists the contents of the 2RU standard accessory kit.

Table 18: C9550-2U-ACKT-19I= contents

Item	Quantity
10-32 x 0.625 inch M Phillips screws	12
12-24 x 0.5 inch M Phillips pan-head screws	8
GNLHW, FEET, POLY, BLK, adhesive	4
Cable management guide Fabricated plastic cable management guide	2
M4 x 20 mm Phillips pan-head screws	2
M4x6 mm Phillips flat-head screws	16
Rack-mount brackets 19 inches Fabricated metal brackets at the front of the rack	2

Optional accessory kits

The optional accessory kit is not shipped with the switch. You must order it separately by using the chassis-specific part number.

Table 19: 23-inch rack mount kit

Switch model	Accessory kit part number
Cisco C9550 2RU Series Smart Switch	C9550-2U-ACKT-23I= Cisco C9550 2RU series 23-inch rack mount kit

This table lists the contents of the 2RU 23-inch optional rack mount kit.

Table 20: C9550-2U-ACKT-23I= contents

Item	Quantity
Rack-mount brackets 23 inches Fabricated metal brackets at the front of the rack	2
M4 x 6 mm Phillips flat-head screws	16
12-24 x 0.5 inch M Phillips pan-head screws	8
10-32 x 0.625 inch M Phillips screws	8
M4 x 20 mm Phillips pan-head screws	2
M4x6 mm Phillips flat-head screws	16
Rack-mounting bracket-19 inches Fabricated metal bracket at the front of the rack	2

The 1U extension rails and brackets for 4P mount spare (C9550-2U-4PTH-KIT=) is not part of the standard accessory kit. You must order it separately by using the chassis-specific part number.

Table 21: 1U extension rails and brackets for 4P mount

Switch model	Accessory kit part number
Cisco C9550 2RU Series Smart Switch	C9550-2U-4PTH-KIT= Cisco C9550 2RU series extension rails and brackets for 4P mount kit

Table 22: C9550-2U-4PTH-KIT= contents

Item	Quantity
Rack mount bracket guide rails Extension rails	2
Rack mount brackets Fabricated metal brackets at the front of the rack	2

Item	Quantity
Rack mount brackets 19 inches Fabricated metal brackets at the front of the rack	2
M4 x 6 mm Phillips flat-head screws	24
12-24 x 0.5 inch M Phillips pan-head screws	12
10-32 x 0.625 inch M Phillips screws	12

NEBS kits

NEBS kit contents for 19-inch rack mounting.

The 19-inch rack mount Network Equipment-Building System (NEBS) kit is not a standard accessory kit. You must order it separately by using the chassis-specific part number.

NEBS kit part number	Description
C9550-NEBS-KIT=	C9550 NEBS kit

The NEBS installation kit consists of the following items.

Table 23: Contents of the NEBS kit

Item	Quantity
Filter frame assembly A fabricated metal assembly to attach the filter cover.	1
Filter cover assembly A fabricated metal assembly to attach the air filter.	1
M3x8 mm Phillips pan-head screws	4

NEBS filter kit

The NEBS air filter is not a standard accessory kit. You must order it separately by using the chassis-specific part number.

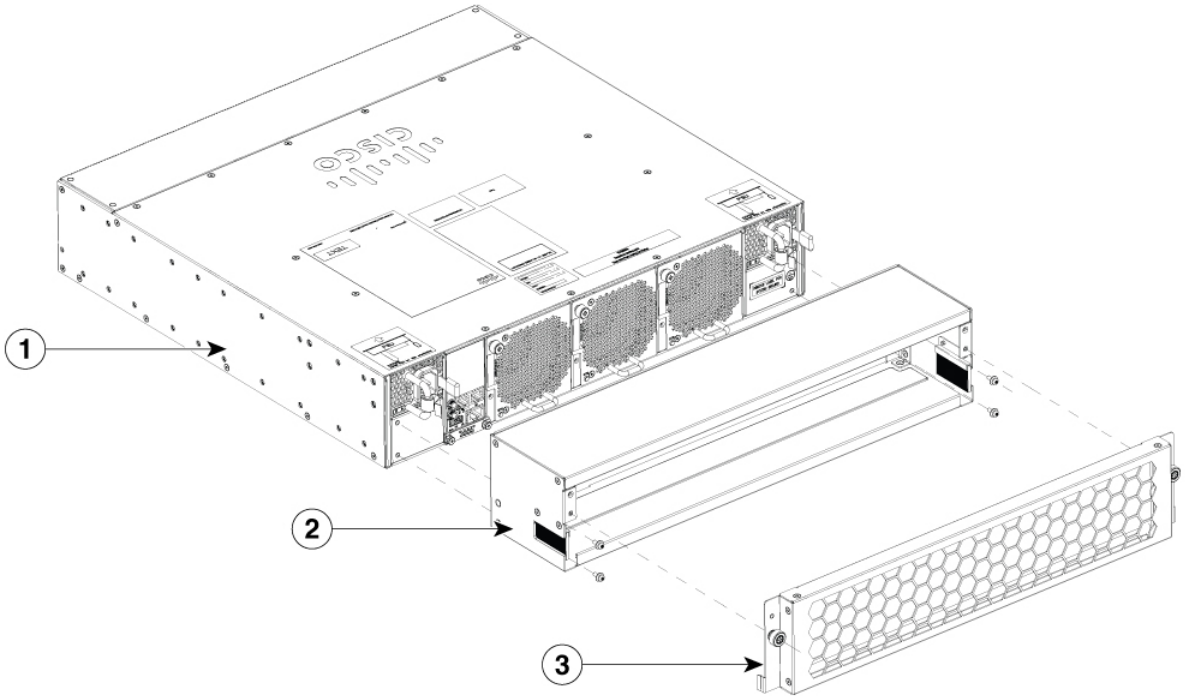
NEBS filter part number	Description
C9550-NEBS-FL-PE=	Cisco C9550 NEBS filter (port-side exhaust airflow)

Table 24: Contents of the NEBS filter kit

Item	Quantity
Filter cover (reuse NEBS filter cover) A fabricated metal assembly to attach the air filter.	1

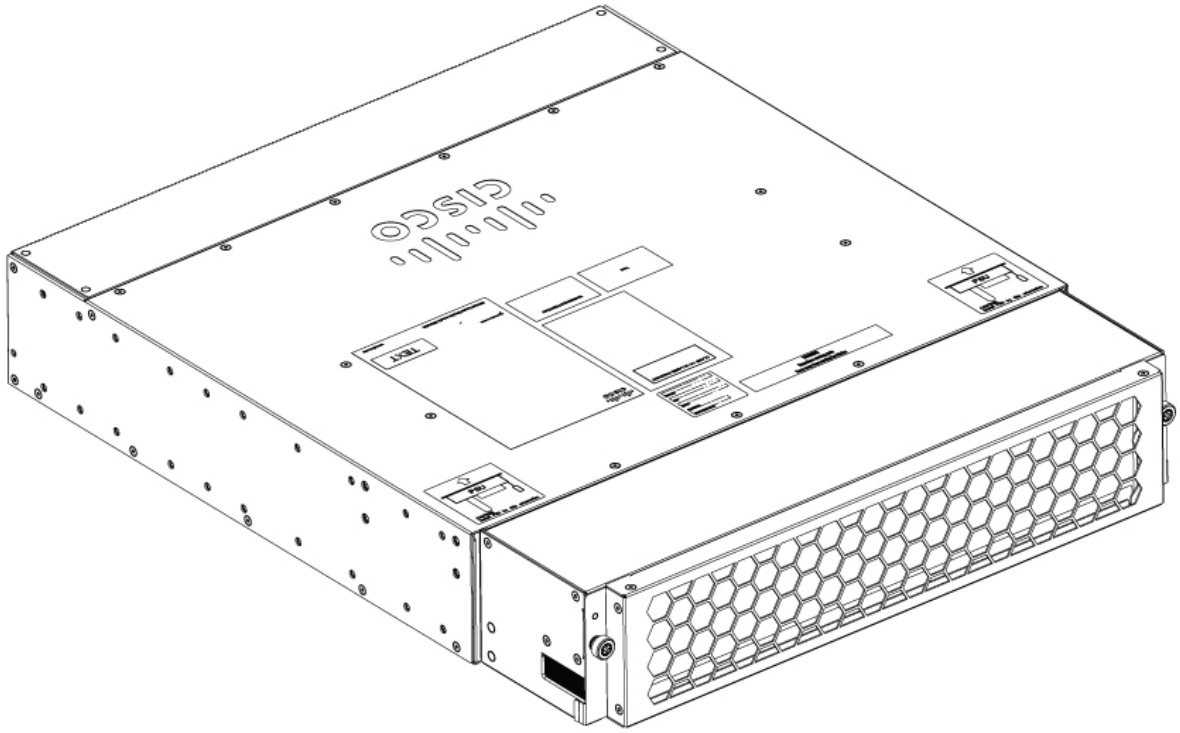
Item	Quantity
Air filter The air filter for filtering dust particles from entering the chassis.	1
M3x8 mm Phillips pan-head screws	4

Figure 10: NEBS filter kit



1	C9550 Series Smart switch	3	Air filter
2	Filter cover	-	

Figure 11: Switch with NEBS filter kit attached



Unpack the box

Unpack the shipping box and verify the contents.

Check the contents of the accessory kit.

> **Note**
>
> Do not discard the shipping container when you unpack the switch. Flatten the shipping cartons and store them with the pallet. You will need these containers if you need to move or ship the switch in the future.

Verify that you received all listed equipment, which should include the following:

- Grounding lug and disposable ESD strap.
- Optional equipment that you ordered, such as console cables, transceivers, or special connectors.
- Blank covers are installed for the power supply slots on the chassis.

3 Install the Switch

Topics:

- Install the switch
- Install and remove fans
- Install and remove power supply units
- Install and remove an SSD

Provides comprehensive, step-by-step instructions for installing and grounding the Cisco C9550 Series Smart switches. Includes safety warnings and troubleshooting tips also.

This module describes

- the different methods to install the switch,
- remove and reinsert the fan modules,
- remove and reinsert the power supply modules, and
- verify the switch installation.

Install the switch

Describes how to rack mount the switch on different type of racks.

This section describes the different types of rack mount brackets, how attach the rack mount brackets, and mount the switch.

Before your rack mount your switch, follow these guidelines.

1. Determine which end of the chassis is to be located in the cold aisle as follows:
   - If the switch has port-side intake modules (fan modules with burgundy coloring), position the switch so that its ports will be in the cold aisle.
   - If the switch has port-side exhaust modules (fan modules with blue coloring), position the switch so that its fan and power supply modules will be in the cold aisle.
2. Determine which way the chassis should slide in and out of the rack—port-side entry first or rear-side entry first. You might consider whether the front or back of the rack provides better clearance for maneuvering the chassis in and out during installation and servicing. The end that needs to enter the rack first requires the guides and the other end the brackets.

Attach rack mount brackets

Instructions to attach the rack-mount brackets to the switch.

You can rack mount the Cisco C9550 Series Smart switches, into the front, middle, or rear of the switch. Use M4.0x6mm Phillips flat-head screws to attach the long side of the bracket to each side of the switch.

This section displays the two-post rack-mount brackets used on the 1RU and 2RU C9550 Series Smart switches.

Figure 12: Two-post rack-mount brackets for 1RU switches

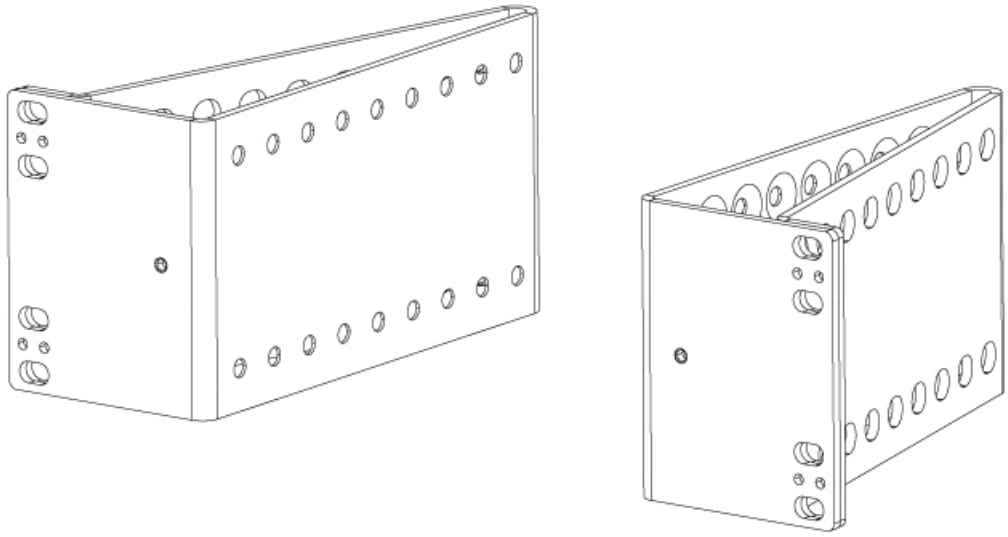
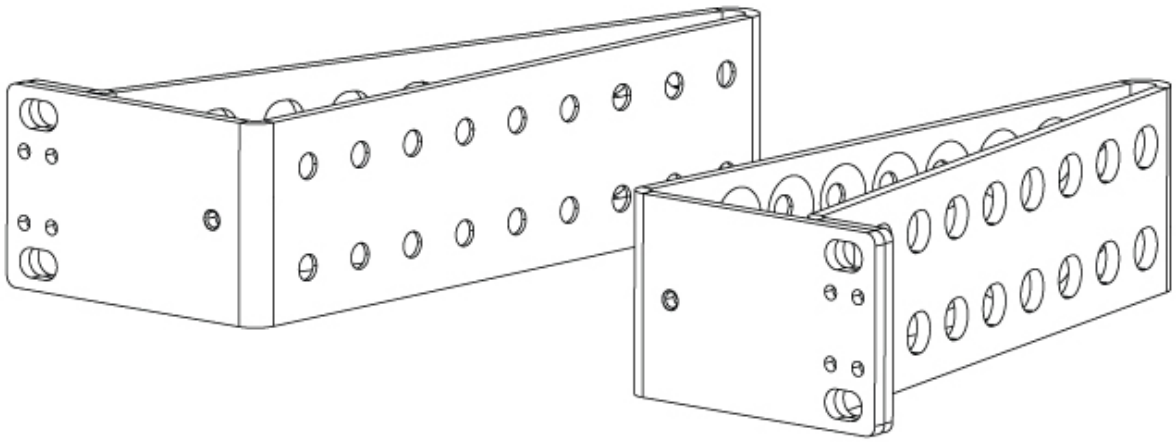


Figure 13: Two-post rack-mount brackets for 2RU switches



Rack mount the switch on two-post racks

Instructions to rack-mount the switch into 2-post racks.

Rack mount the switch into a 2-post rack

Procedure

1. Install two rack-mount brackets onto the switch.
   - Position a rack-mount bracket so that four of its screw holes are aligned to the screw holes on the side of the chassis.

     Figure 14: Attaching the two-post rack-mount brackets on a 1RU switch

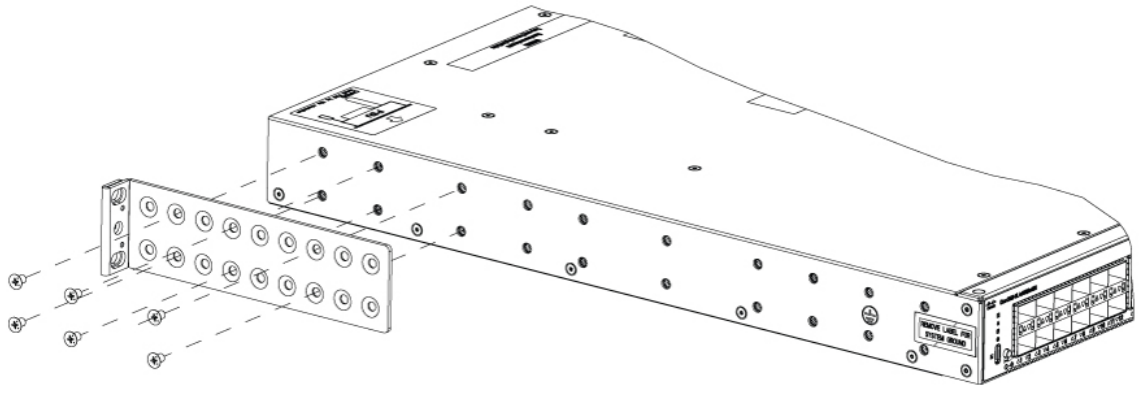
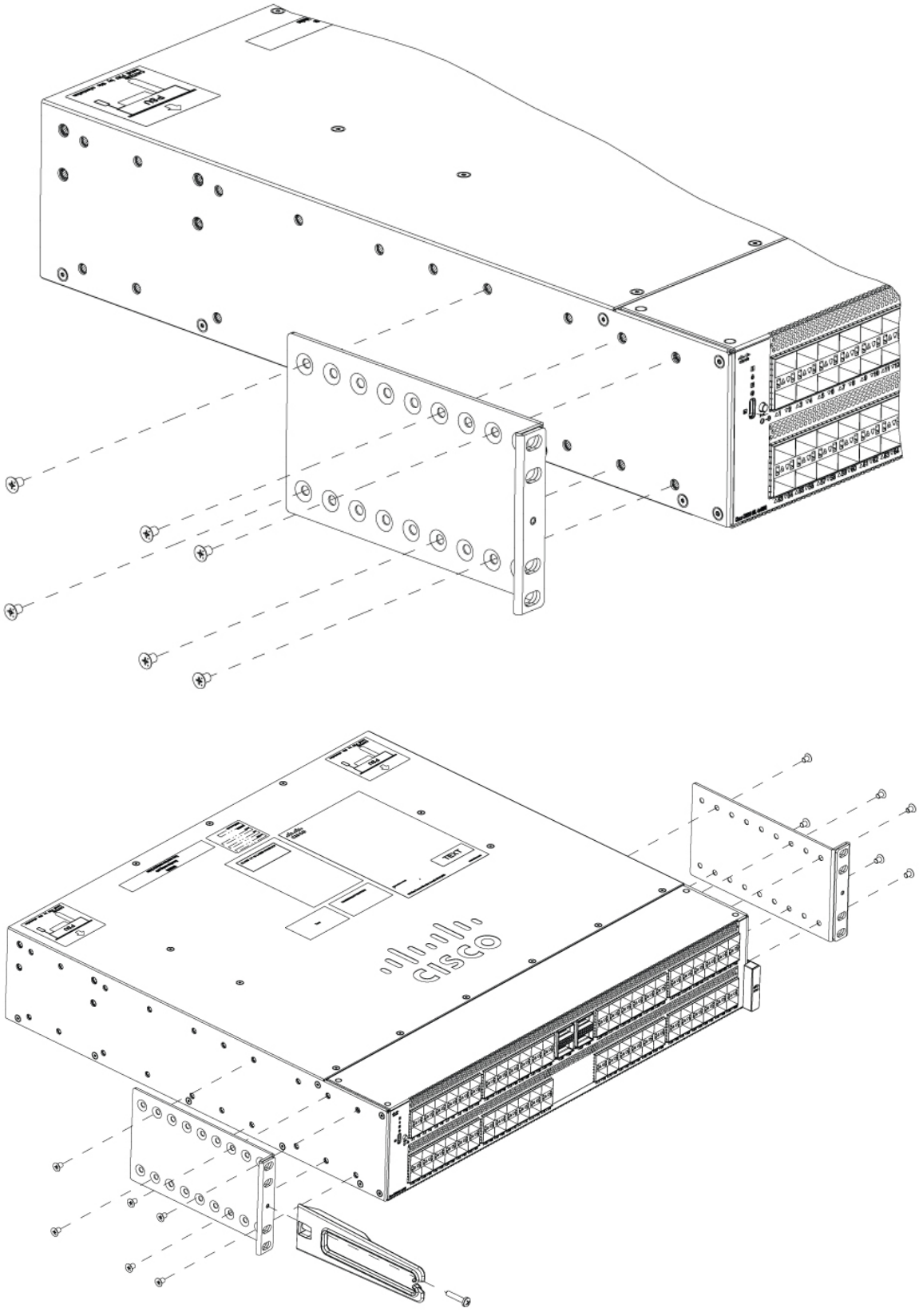


Figure 15: Attaching the two-post rack-mount brackets on a 2RU switch



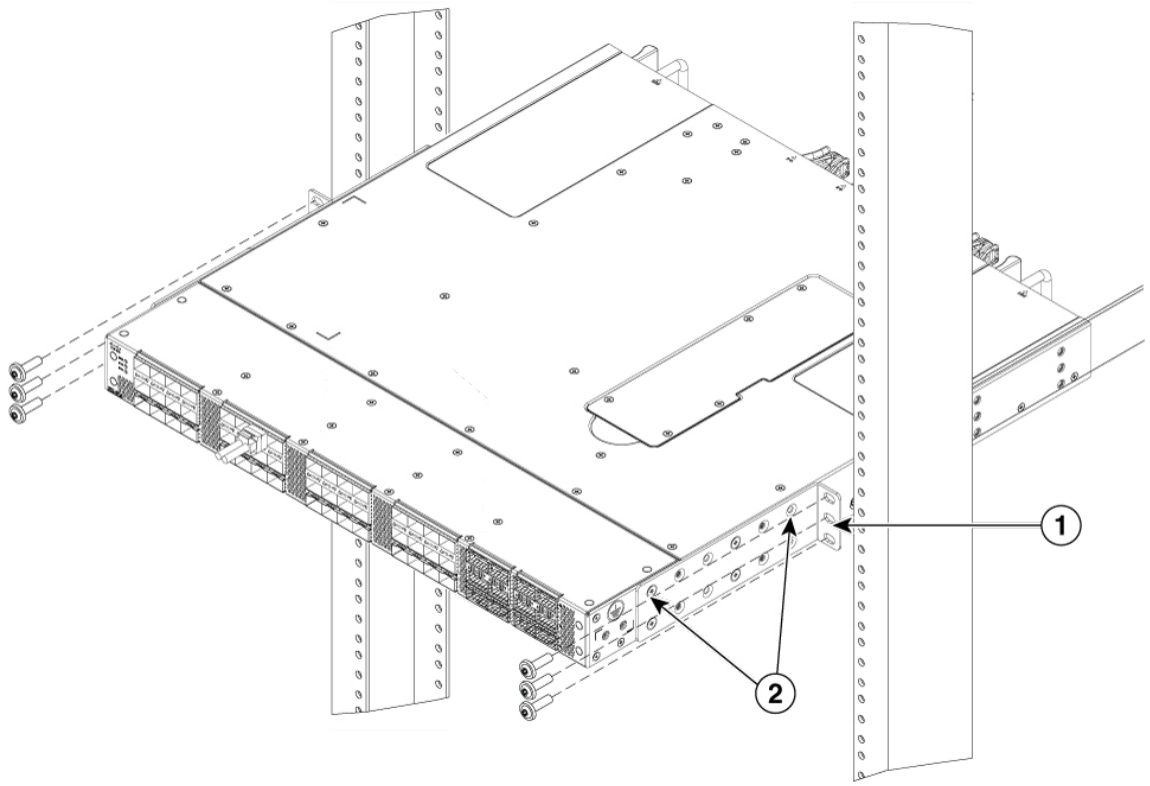
You can align any four of the holes in the rack-mount bracket to four of the six screw holes on the side of the chassis. The holes that you use depend on the requirements of your rack and the amount of clearance.

- You can install the rack-mount bracket either at the front or rear of the chassis. The choice is determined by which end of the chassis will be inserted into the rack first. If the rear end of the chassis is to be inserted first, then mount the brackets on the front of the chassis, and vice versa.

If you are installing the chassis into an ungrounded rack, you must attach a customer-supplied grounding wire to the chassis. However, if you are installing the chassis into a grounded rack, you can skip this step.

2. Install the switch onto the 2-post rack.
   a. Holding the switch with both hands, position the back of the switch between the two posts of the rack. Then gently move the switch until the rack-mount brackets come in contact with two rack posts.
   b. Holding the chassis level, insert three screws (12-24 or 10-32, depending on the rack type) into each of the two rack-mount brackets (using a total of six screws) and into the cage nuts or threaded holes in the rack or cabinet posts.

      Figure 16: Installing the switch onto the 2-post rack from the front side of the chassis



1	Two-post rack	2	Mounting brackets

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

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

Rack mount the switch on four-post racks

Instructions to rack mount the switch onto a 4-post rack.

To install the switch on four-post racks, you must attach the rack mounting guides to the switch, install the slider rails, slide the switch into the slider rails, and secure the switch to the front of the rack. Typically, the front of the rack is the side that is easiest to access for maintenance.

Before you begin

- Ensure that the rack is installed and secured to its location.
- Determine how you want to set up your switch.

Procedure

1. Use the Phillips machine screws to attach the brackets and the extension rail to the switch.

   Position the mount brackets and extension rails such that the screw holes are aligned to the screw holes on the switch, and secure the brackets and extension rails to both sides the switch.

   Figure 17: Four-post rack-mount kit for 1RU switches

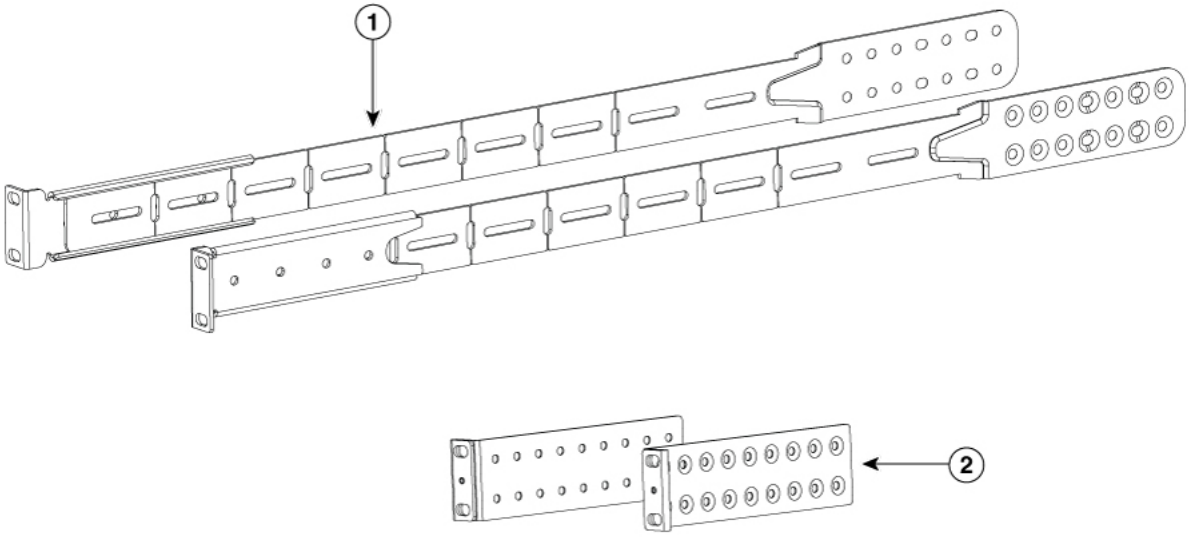
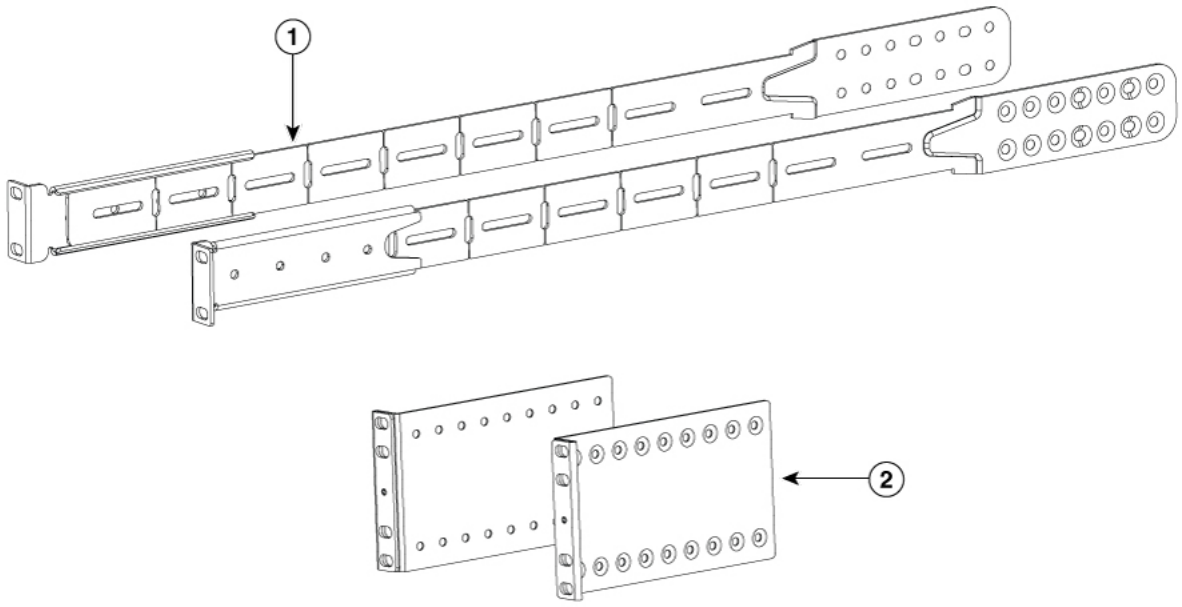
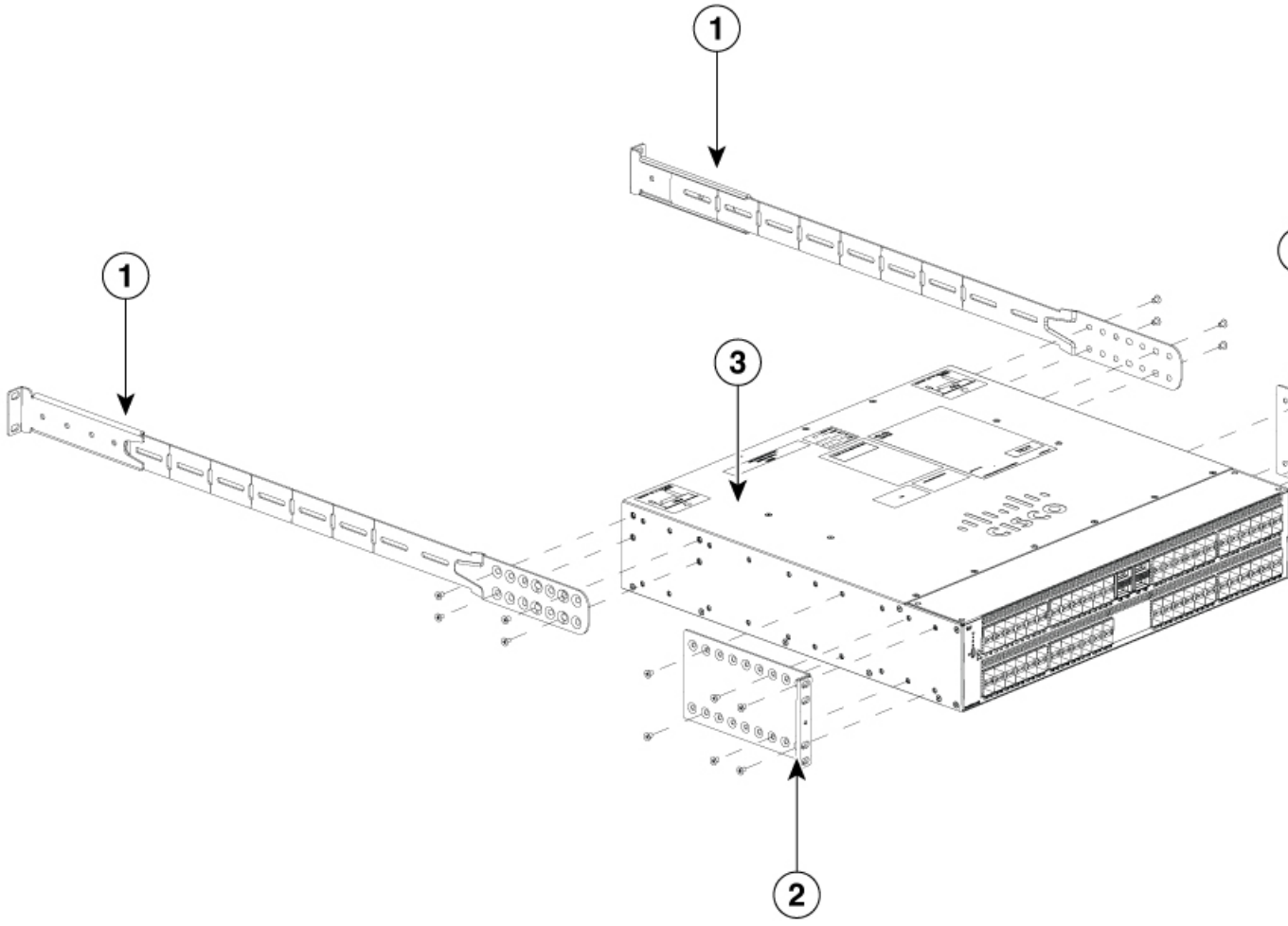


Figure 18: Four-post rack-mount kit for 2RU switches



2. Install the extension rails into the rack or cabinet.

Figure 19: Attaching extension or slider rails



1	Extension rails	3	Cisco C9550 Series Smart switch
2	Mounting brackets	-	

a. Determine which two posts of the rack or cabinet you should use for the extension rails. Of the four vertical posts in the rack or cabinet, two will be used for the rack-mount brackets, and the other two posts will have the extension rails.

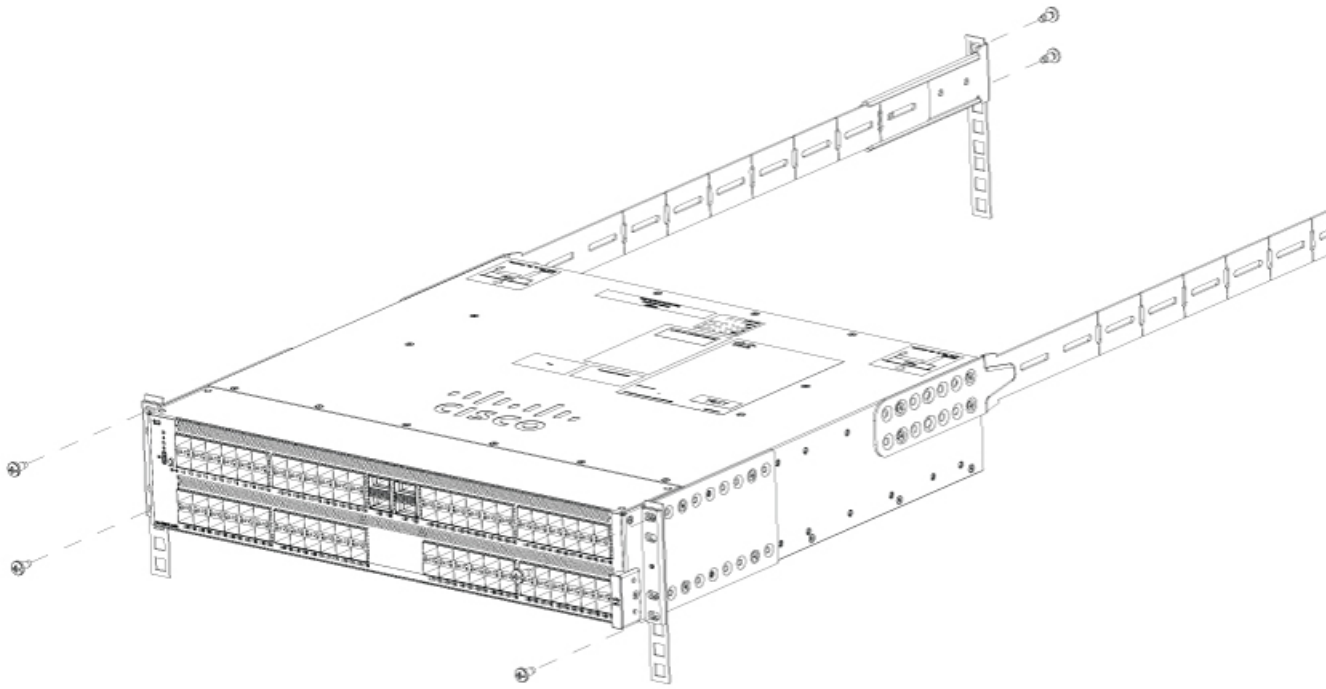
b. Position a extension rail at the desired level side of the rack and use two 12-24 screws or two 10-32 screws, depending on the rack thread type, to attach the extension rail to the rack.

c. Attach the other extension rail to the other side of the rack. To make sure that the extension rails are at the same level, you should use a level tool or tape measure, or carefully count the screw holes in the vertical mounting posts.

3. Secure the switch to the rack rails using the number-12 or number-10 Phillips machine screws provided with the accessory kit.

a. Hold the switch with both hands, position the rack-mount brackets on the switch between the rack or cabinet posts that do not have extension rails attached to them.

Figure 20: Mounting the switch in a rack



b. Align the two rack-mount guides on either side of the switch with the extension rails installed in the rack. Slide the rack-mount guides onto the extension rails, and then gently slide the switch all the way into the rack until the rack-mount brackets come in contact with the two rack or cabinet posts.

> **Note**
>
> If you attached a grounding cable to the chassis, you will need to flex one of the rack-mount posts slightly to allow the grounding lug to go behind the post.

c. Hold the chassis level, insert two screws (12-24 or 10-32, depending on the rack type) in each of the two rack-mount brackets (using a total of four screws) and into the cage nuts or threaded holes in the rack or cabinet posts.

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

Ground the switch

How to ground your switch after it is installed on a rack.

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

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

Ground the rack if using LVDC power supplies. If using AC or HVDC power supplies, the power cord for the AC power supplies provides grounding for the chassis. For supplemental grounding or bonding, attach a customer-supplied grounding cable to the chassis ground pad.

Ground the chassis. If you are using a 2-post rack, attach a customer-supplied grounding cable. Attach the cable to the chassis grounding pad and the facility ground. If you are using a 4-post rack, ensure that your chassis is grounded through the rack mount system or the power cable (AC or HVDC).

Warning

Statement 1024–Ground Conductor

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

Warning

Statement 1046–Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

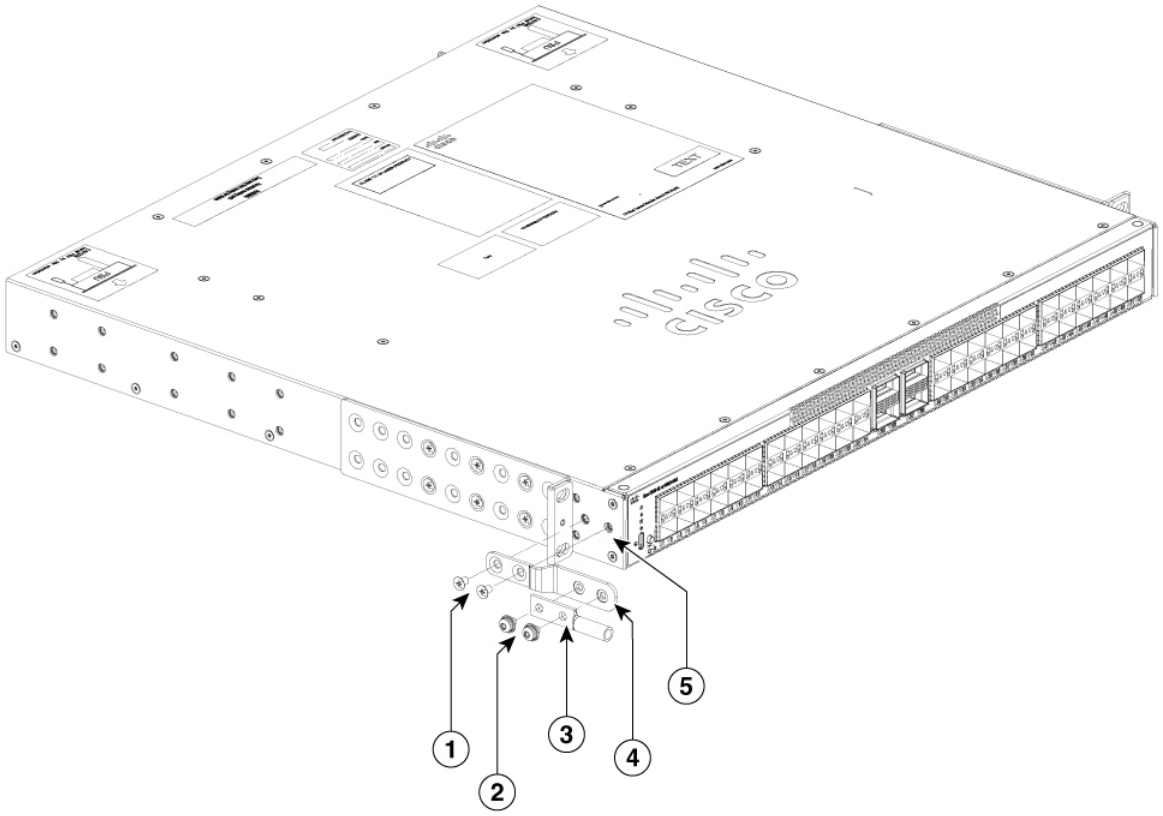
Before you begin

Before you can ground the chassis, verify the earth ground contact has a solid connection to the data center building.

Procedure

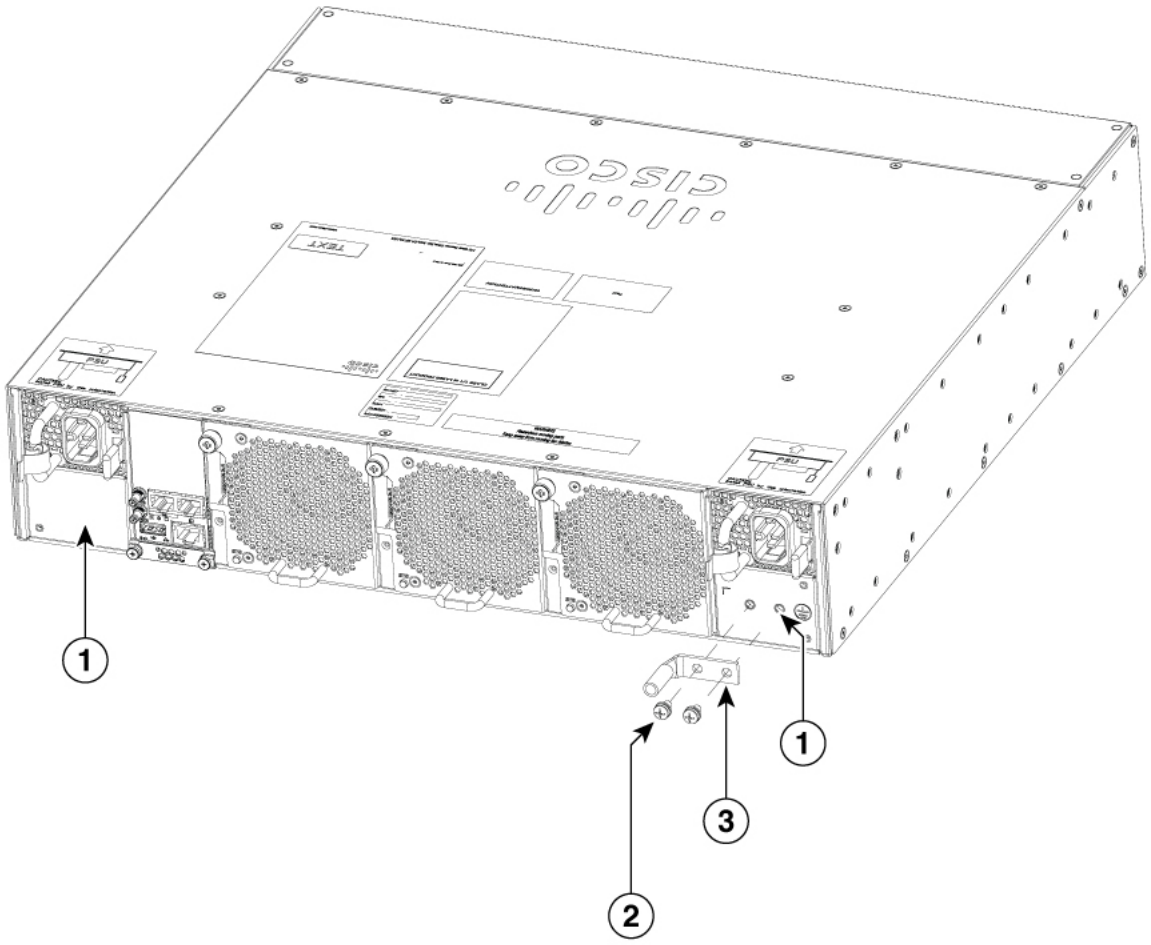
1. Use a wire-stripping tool to remove approximately 0.75 inch (19 mm) of the covering from the end of the grounding wire. We recommend 6-AWG wire for the U.S. installations.
2. Insert the stripped end of the grounding wire into the open end of the grounding lug. Use a crimping tool to crimp the lug to the wire. See the figure. Verify that the ground wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug (tug test).

   Figure 21: Attaching the grounding lug onto a IRU switch



1	2 counter sunk M4 x 0.6 screws to secure the grounding lug to the chassis	4	Chassis grounding bracket
2	2 M4 x 0.6 pan-head screws to secure the grounding lug to the grounding bracket	5	Location on the switch where the grounding lug is attached
3	Chassis grounding lug	-	-

Figure 22: Attaching the grounding lug onto a 2RU switch



1	Location on the switch where the grounding lug is attached	3	Chassis grounding lug
2	2 M4 x 0.6 pan-head screws to secure the grounding lug to the grounding bracket	-	-

3. Secure the grounding lug to the chassis grounding pad screws. Tighten the screws to 11 to 15 in-lb (1.24 to 1.69 N m) of torque.

   For IRU switches, the grounding lug is secured to the chassis grounding pad with four M4 screws. And for 2RU switches the grounding lug is secured with two M4 screws.

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

Post install procedure

What to do after you rack mount your switch.

This section describes the post installation checks to be done on your switch.

- Configure the switch using the Web User Interface. For more information, refer to "Configuring the switch using the Web User Interface" topic in the Software Configuration Guide.
- Connect the required devices to the switch ports.

- Turn on the power supply switches to power up the system. While powering up, the switch performs a series of bootup diagnostic tests.

  Note

  The switch is designed to boot up in less than 30 minutes, provided that the neighboring devices are in fully operational state.

- Verify port connectivity after connecting devices to the switch ports. The LED turns green when the switch and the attached device have a link.

Install and remove fans

Describes fan installation guidelines and how to remove and reinsert fans in the C9550 Series Smart switches.

This section provides information about

- fan installation guidelines and
- remove and reinsert fans while the switch is operational.

Install guidelines

Guidelines for installing fan modules.

Observe these guidelines when removing or installing a fan module.

- Do not force the fan module into the slot. This can damage the pins on the switch if they are not aligned with the module.
- A fan module that is only partially connected to the switch can disrupt the system operation.
- The switch supports hot swapping of the fan module. You can remove and replace the module without interrupting normal switch operation.

Remove and reinsert 1RU fans

Step-by-step instructions to remove and reinsert C9550-FAN-1U fans in your Cisco C9550 switch.

The procedure to remove and reinsert the 1RU and 2 RU fans are different. This section provides instructions on how to remove and reinsert C9550-FAN-1U fans in your Cisco C9550 Series Smart switches. The C9550-FAN-1U fans are supported by the Cisco C9550 1RU switch models.

Procedure

1. To remove a fan module, press the ejector levers inward.
2. Pull the fan module and slide it out of the slot.

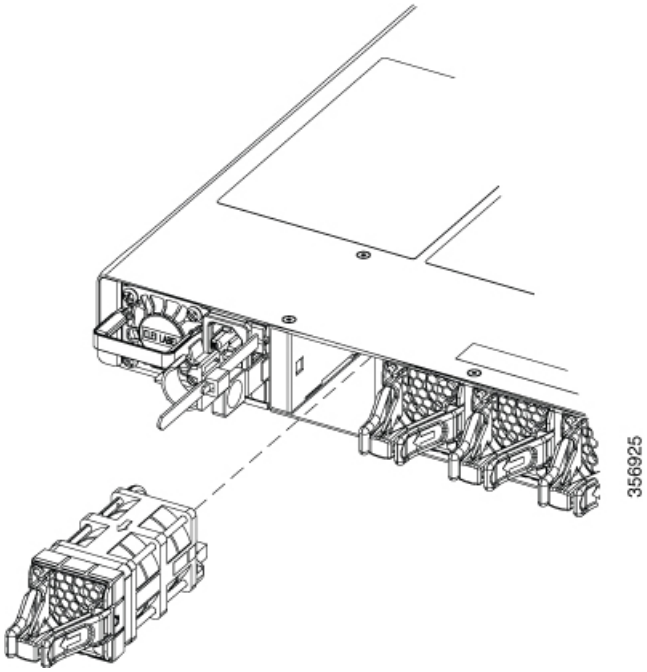
> **Caution**
>
> You should replace the fan module within 5 minutes to avoid overheating the switch.

3. Align the fan module along the fan slot and firmly push it into the slot, applying pressure to the end of the module.

   When correctly inserted, you can hear a click, and the fan module is flush with the switch rear panel.

   When the fan is operating, the status LED on the top left corner of the fan module will glow green.

   Figure 23: Installing a fan module



Remove and reinsert 2RU fans

Step-by-step instructions to remove and reinsert C9550-FAN-2U fans in your Cisco C9550 switch.

The procedure to remove and reinsert the 1RU and 2 RU fans are different. This section provides instructions on how to remove and reinsert C9550-FAN-2U fans in your Cisco C9550 Series Smart switches. The C9550-FAN-2U fans are supported by the Cisco C9550 2RU switch models.

Procedure

1. To remove a fan module, loosen the screw on the top left corner of fan module.

   You cannot remove the screw from the module.

2. Holding the handle, pull the fan module and slide it out of the slot.

> **Caution**
>
> You must replace the fan module within 5 minutes to avoid overheating the switch.

Figure 24: Remove a fan module



To view the animation, click this link.

3. To insert a fan module, align the fan module along the fan slot and firmly push it into the slot, applying pressure to the end of the module.

   When correctly inserted, the fan module is flush with the switch rear panel.

4. Tighten the screw on the fan module.

   When the fan is operating, the status LED on the bottom left corner of the fan module will glow green.

Figure 25: Installing a fan module



To view the animation in PDF, click this link.

Install and remove power supply units

Describes how to remove and reinstall a power supply module and connect to an AC and DC power source.

This section provides information about

- Guidelines to install power supply units
- Removing power supply units
- Installing power supply units
- Connect to an AC power source
- Connect to a DC power source.

Connect to a power source

Each power cable is shipped with mating connectors with one of the connectors on the power socket and the other connector on the front panel of the power supply. You follow the same steps to install the AC-input and DC-input power supplies, but you must ground them differently.

- AC-input power supply—It is automatically grounded when you connect its power cable to the power supply and the power source.
- DC-input power supply—You do not connect the power supply directly to the earth ground.

You use one power cord for each power supply to connect the power supply to its power source.

Power supply install guidelines

Provides safety warnings and guidelines to install power supply units.

The switch chassis must be installed in a cabinet or rack that is secured to the data center.

- Remove the power supply from its shipping container and remove any packaging.
- You need the following additional tools and equipment.
  - Nut driver attachment for number 1 Phillips-head screwdriver or ratchet wrench with torque capability (used only for DC-input power supplies).
  - Grounding wire—Size this wire to meet local and national installation requirements. For U.S. installations, you must use an 8-14 AWG copper conductor for AC power supply systems. For installations outside the U.S., consult your local and national electrical codes. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- The chassis is connected to an earth ground.
- Receptacles are available for the power sources within reach of the power supply cables.
- When connecting to DC power, check that you are using the correct power cables to connect to the power supply. The wire size applies to the negative [-], and positive [+] cables that connect to negative and positive apertures on the connector. You have to procure the power cable.
- If you are installing more than one DC-input power supply, each must be protected by a dedicated circuit breaker or a fuse that is sized according to the power supply input rating and the local or national electrical code requirements.
- The power sources are rated as follows:
  - For North American AC-input installations: 20A with 120V circuits.

- For North American DC-input installations: -48 VDC nominal at 50 A in North America (operating range: -40.5 to -56 VDC).
- For international installations—Size the circuits by local and national standards.

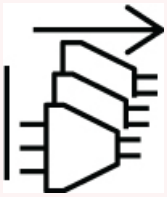
Caution

Ensure that the power source is OFF. As an added precaution, place the appropriate safety flag and lockout devices at the source power circuit breaker to prevent accidental power restoration while you are working on the circuit.

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 1003–DC Power Disconnection

To reduce risk of electric shock or personal injury, disconnect DC power before removing or replacing components or performing upgrades.

Warning

Statement 1046–Installing or Replacing the Unit

To reduce risk of electric shock, when installing or replacing the unit, the ground connection must always be made first and disconnected last.

If your unit has modules, secure them with the provided screws.

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.

Remove power supply units

Step-by-step instructions to remove a power supply unit.

Procedure

1. Turn off the power to the power supply that you are removing.

   If you are removing a DC-input power supply, ensure that the power is turned off at the power source by turning off the power for that circuit.

2. Detach the power and ground cables.
   - For the AC-input power supply, unplug the power cables that are attached to the power supply and the power source.
   - For the DC-input power supply, remove the power cables from the power supply and the power source.

3. To remove the power supply from the chassis, press the ejector latch on the right side of the power supply unit.

   Figure 26: Remove a power supply unit

   To view the animation in PDF, click this link.

4. Pull the power supply out of the slot by its handle.

Caution

If you intend to operate the switch without installing another power supply in the empty slot, you must install a blank cover over the empty power supply slot to ensure proper air flow in the system and for safety reasons.

Figure 27: Switch with PSU blank not installed

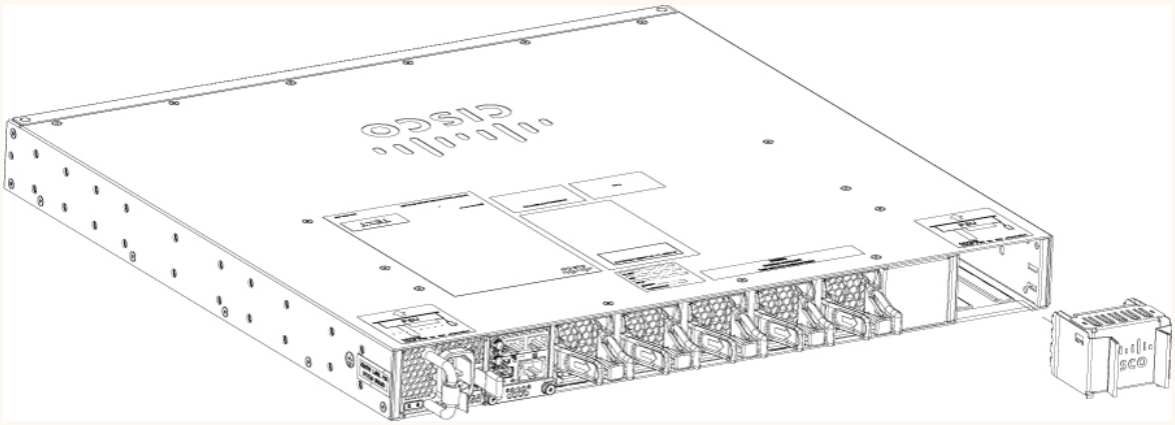
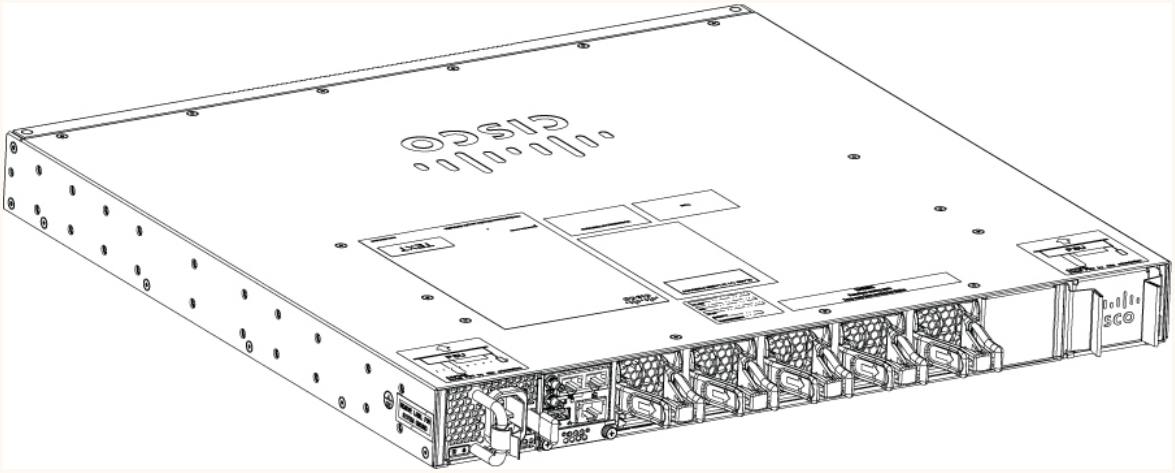


Figure 28: Switch with PSU blank installed



Insert power supply units

Instructions to insert power supply units into Cisco C9550 switches.

Procedure

1. Remove the blank cover and store it for future use.
2. Verify that the power supply is not connected to any power sources.
3. Hold the handle on the power supply with one hand and position the power supply with its back end at the open power supply bay.

   Figure 29: Insert the power supply unit



To view the animation in PDF, click this link.

4. Slide the unit all the way into the power supply bay until the release latch on the right side of the power supply clicks into place and prevents you from moving the power supply in or out of the chassis.

   Ensure that the power supply in inserted into the slot in the right direction. If you have inserted the power supply in the reverse direction, the amber LED on the power supply blinks continuously.

Connect to an AC power source

Step-by-step instructions to connect to an AC power source.

Procedure

1. Prior to connecting the power supply to a power source, ensure that the chassis is properly grounded.
2. Plug the power cable into the power supply.
3. Plug the other end of the power cable into a power source supplied by the data center.

   Note

   When using redundant mode, connect each power supply to a separate power source.

   Verify that the power supply is receiving power by checking the power supply LEDs. For more information about the power supply LEDs and the conditions that they indicate, refer to the Power supply LEDs section.

Connect to a DC power source

Step-by-step instructions on how to connect to a DC power source.

Perform this task to connect a DC power supply directly to one or two DC power sources.

Warning

Statement 1033–Safety Extra-Low Voltage (SELV)–IEC 60950/ES1-IEC 62368 DC Power Supply

To reduce the risk of electric shock, connect the unit *only* to a DC power source that complies with the SELV requirements in the IEC 60950-based safety standards or the ES1 requirements in the IEC 62368-based safety standards.

Procedure

1. Prior to connecting the power supply to a power source, ensure that the chassis is properly grounded.
2. Turn off the power at the circuit breakers for portions of the DC grid power that you are connecting to and verify that all the LEDs on the DC grid power supplies are off.
3. Plug the DC power cable into the DC power supply.
4. Attach the cable to the output of the power source.

   For the PWR-2KW-DC-CBL cable, pin 1 of the Amphenol connector is attached to the red cable, and pin 2 is attached to the black cable. Connect the black cable to +DC terminal at the PSU side, which is the battery (positive/+) terminal.

   Connect the green or yellow lead to the rack ground or building earth ground to ensure proper grounding of the switch, before powering it on.
5. Verify that the power supply is receiving power by checking that the LED is on and the color is green. For more information about the power supply LEDs and the conditions they indicate, refer to the *Power supply LEDs* section.

   When you first activate the power supply, if the LED is flashing amber or red, check the power connections on the power supply and the power source.

Install and remove an SSD

Instructions to install and remove an SSD from the Cisco C9550 Series Smart switches.

This section describes how to install and remove an SSD from the Cisco C9550 Series Smart switches while the switch is operational.

Install an SSD module

Steps to install an SSD module on Cisco C9550.

Procedure

1. Remove the screws on the blank cover of the SSD module slot on the switch and store it for future use.
2. Insert the SATA SSD module into the USB 3.0 SSD module slot, and firmly push it in.

   For information about the SATA SSD modules, refer to M2 SSD module on page 19 section.
3. To ensure that the SSD module is inserted correctly, verify that the LED on the SSD module turns solid green.

Remove an SSD module

Steps to remove an SSD module.

SATA SSD module is available as a field-replaceable unit (FRU). The SSD module has a button which facilitates hot-swapping of the module. To prevent data loss, press the hot-swap button to request for removal and wait for the system to confirm a safe-removal by turning off the SSD status LED.

Procedure

1. Use a pin to press the reset button to hot-swap the SSD module.

   The system powers down the SSD module and the port and the LED turns off indicating that the module is ready for removal.

   The switch console displays messages indicating a safe removal.

2. Remove the SSD module from the module slot and insert the blank slot cover.

4 Configure the Switch

Topics:

- Configure the switch using the web user interface
- Access the CLI through the console port

What to do after you install your C9550 Series Smart switches.

This chapter provides information on how to configure the switch through the WebUI and the command line interface.

Configure the switch using the web user interface

How to configure C9550 switch through the web user interface.

For instructions on setting up the switch using the WebUI, refer to the *Web UI-Based Provisioning* article.

Access the CLI through the console port

How to access the CLIs through the console port.

You can access the CLI on a configured or unconfigured switch by connecting the RJ-45 console port or USB console port of the switch to your PC or workstation and accessing the switch through a terminal emulation program.

Connect the RJ45 console port

How to connect the RJ console adapter to the port and power on the switch.

This task describes how to connect the RJ45 console adapter to the port and power on the switch

Procedure

1. Connect the RJ45 port adapter to the serial port on the terminal server or your PC using the optional RJ45-to-DB9 adapter cable. Connect the other end of the cable to the switch console port.
2. Start the terminal-emulation program on the PC or the terminal. The program, frequently a PC application such as Putty or TeraTerm, makes communication between the switch and your PC or terminal possible.
3. Configure the baud rate and character format of the PC or terminal to match the console port default characteristics.
   - 1 stop bit
   - 8 data bits
   - 9600 baud (default)
   - No parity
   - None (flow control)
4. Power on the switch.
5. The PC or terminal displays the bootloader sequence.

Connect to the USB console port

How to connect to the USB console port.

The Cisco C9550 Series Smart switches will either have a Cisco USB Device or Silicon Labs USB Device (CP2102N).

To identify which USB device is available,

- connect a USB cable from the Windows-based PC or Mac-based PC to the USB console port.

> **Note**
>
> On a Windows-based device, we recommend using the default Windows driver.

Procedure

1. To install the USB driver to a Windows-based PC or Mac-based PC for the first time, do the following:
   - Windows-based PC

     We recommend using the default Windows driver.
   - MAC-based PC
     - For Cisco USB devices, no driver installation is required.
     - For Silicon Labs USB device. you can download the USB driver from the Silicon Labs website . Once the installation is completed, a virtual COM port session, "tty.SLAB_USBtoUART", will be started.

       > **Note**
       >
       > Do not use the generic USB serial driver available on Mac-based PCs.

2. On a Mac-based PC: Before connecting the USB cable to the MAC, run the “ls -lrt /dev/tty.usb*” command from the terminal application on MAC.
3. Connect a USB cable to the PC USB port. Connect the other end of the cable to the switch Type C USB console port.
4. Start the terminal-emulation program on the PC or the terminal. The program, frequently a PC application such as Putty or TeraTerm, makes communication between the switch and your PC or terminal possible.
5. On a MAC-based PC: After connecting the USB cable, run the “ls -lrt /dev/tty.usb*” command from the terminal application to identify the device.

   The new device is identified as “/dev/tty.usbserial-XXXXX”.
6. Configure the baud rate and character format of the PC or terminal to match the console port default characteristics.
   - 1 stop bit
   - 8 data bits
   - 9600 baud (default)
   - No parity
   - None (flow control)

   To configure the baud rate on a Mac-based PC, run the “screen /dev/tty.usbserial-XXXXX <baud-rate>” command.
7. Power on the switch as described in the switch getting started guide.
8. The PC or terminal displays the bootloader sequence.

A Technical Specifications

Topics:

- Environmental specifications
- Physical specifications
- AC-input power supply specifications
- AC power cord specifications
- DC power cord specifications
- Connector Specifications
- Console cables
- Cables and adapters

Provides information about the physical and environmental specifications of the switch, and the FRUs. This module also provides information about the AC and DC power cords used by the AC and DC power supply modules.

Technical specifications of the Cisco C9160 chassis, power supply units, and fans.

Environmental specifications

Environmental specifications of the switch, power supply modules, and fans.

This section describes the environmental specifications for the Cisco C9550 Series Smart switches, power supply modules, and fans.

Table 25: Environmental specifications for the switch

Environmental ranges	
Operating temperature	• With C9550-FAN-1U-F: -5° C to +35° C (23° to 95° F) • With C9550-FAN-1U-R: -5° C to +45° C (23° to 113° F) • With C9550-FAN-2U-F: -5° C to +35° C (23° to 95° F) • With C9550-FAN-2U-R: -5° C to +45° C (23° to 113° F)
Storage temperature	-40° C to 70° C (-40° to 158° F)
Relative humidity	• Operating: 10% to 85% (noncondensing) • Non-Operating: 0% to 95% (noncondensing)
Operating altitude	Up to 6,000 feet (1,800 m)
Storage altitude	Up to 10,000 feet (3,000 m)
Heat dissipation (in British Thermal Units [BTU])	1000 BTU/hr = 293W • C9550-24L4CD: 1,880 BTU/hr • C9550-48L4CD: 2,000 BTU/hr • C9550-96L4D: 3,200 BTU/hr

Acoustic measurements

This section lists the acoustic measurements for the different switch models.

Switch model	Sound power level
C9550-24L4CD	Not greater than 87.2 L_{WAd} dB
C9550-48L4CD	Not greater than 85.7 L_{WAd} dB
C9550-96L4D	Not greater than 89.3 L_{WAd} dB

Physical specifications

Lists the weight and dimensions of the switch, fans, and power supply modules.

This section describes the dimensions and weight of the switch models, fans, and power supply modules.

Physical specifications of the switch
Table 26: Dimensions of Cisco C9550 Series Smart switches

Switch PID	Dimensions (H x W x D) in inches and centimeter	Weight (with 2 power supply units and built-in fans)
C9550-24L4CD	1.73 x 17.5 x 18.15 in (4.39 x 44.45 x 46.1 cm)	20.13 lb (9.15 kg)
C9550-48L4CD	1.73 x 17.5 x 18.15 in (4.39 x 44.45 x 46.1 cm)	20.79 lb (9.45 kg)
C9550-96L4D	3.47 x 17.5 x 17.85 in (8.81 x 44.45 x 45.32 cm)	33.55 lb (15.25 kg)

Physical specifications of fans
Table 27: Weight of fan modules

Switch PID	Weight
C9550-FAN-1U-F	0.26 lb (0.12 kg)
C9550-FAN-1U-R	0.26 lb (0.12 kg)
C9550-FAN-2U-F	1.76 lb (0.8 kg)
C9550-FAN-2U-R	1.76 lb (0.8 kg)

Physical specifications of power supply modules
Table 28: Dimensions of power supply modules

Power supply PID	Dimensions (H x W x D) in inches and centimeter	Weight
C9K-PWR-750W AC	1.57 x 2.15 x 8.972 in (3.98 x 5.46 x 22.78 cm)	1.76 lb (0.8 kg)
C9K-PWR-1100W AC	1.57 x 2.15 x 8.972 in (3.98 x 5.46 x 22.78 cm)	1.76 lb (0.8 kg)
C9K-PWR-1100 W DC	1.57 x 2.15 x 8.972 in (3.98 x 5.46 x 22.78 cm)	1.98 lb (0.9 kg)

AC-input power supply specifications

Power input specifications for the 750W and 1100W AC power supply modules.

Provides the AC input power supply specifications.

Table 29: 750W AC-input power supply specifications

Specification	Description
AC-input type	Wide-ranging input with power factor correction. **Note** Power factor correction is a standard feature on AC-input power supplies. Power factor correction reduces the reactive component in the source AC current, allowing higher power factors and lower harmonic current components.
AC-input voltage	90 VAC (min) to 264 VAC (max)
AC-input current	9A at 100VAC 3.8A at 240VAC
AC-input frequency	47 to 63 Hz nominal

Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit:
	
	- North America–20 A.
	- International–Circuits sized to local and national codes.
	- All AC power supply inputs are fully isolated.
	  - Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B.
	  - For high-line operation, the power supply operates with the line conductor wired to a source AC phase, and the neutral conductor wired either to a neutral, single-phase power system, or to another source AC phase as long as the net input voltage is in the range of 180 to 264 VAC.

Power supply output	- Main output: 12V at 62.5A - Standby output: 3.3V at 5A
Output holdup time	20 ms minimum with full input range
kVA rating (kilovolt-amperes is the measure of apparent power in electrical systems, indicating the total power output.) [1]	0.75 kVA maximum (total output power)
MTBF	7,937,420 hours

Table 30: 1100W AC-input power supply specifications

Specification	Description
AC-input type	Wide-ranging input with power factor correction. **Note** Power factor correction is a standard feature on AC-input power supplies. Power factor correction reduces the reactive component in the source AC current, allowing higher power factors and lower harmonic current components.
AC-input voltage	90VAC to 264VAC
AC-input current	12.8A at 100VAC 5.2A at 240VAC
AC-input frequency	47 to 63 Hz nominal

Branch circuit requirement	Each chassis power supply should have its own dedicated, fused-branch circuit:
	• North America–20 A.
	• International–Circuits sized to local and national codes.
	• All AC power supply inputs are fully isolated.
	  • Source AC can be out of phase between multiple power supplies in the same chassis, which means that PS1 can be operating from phase A and PS2 can be operating from phase B.
	  • For high-line operation, the power supply operates with the line conductor wired to a source AC phase, and the neutral conductor wired either to a neutral, single-phase power system, or to another source AC phase as long as the net input voltage is in the range of 180 to 264 VAC.

Power supply output	• Main output: 12V at 92A • Standby output: 3.3V at 5A
Output holdup time	20 ms minimum with full input range
kVA rating (kilovolt-amperes is the measure of apparent power in electrical systems, indicating the total power output.) [1]	1.1 kVA maximum (total output power)
MTBF	7,937,420 hours

AC power cord specifications

List the specifications of the AC power cords with illustrations.

This section lists the AC power cords for 750W and 1100W power supply units,along with the illustrations of the power cords.

This table lists the specifications for the AC power cords that are supported for the 750 and 1100 W AC-input power supplies supported with Cisco C9550 Series Smart switches.

The power cords have an IEC60320/C15 appliance connector at one end.

Figure 30: IEC60320/C15 appliance connector

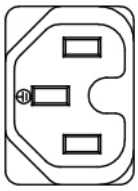
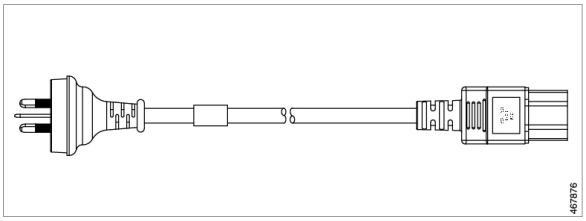
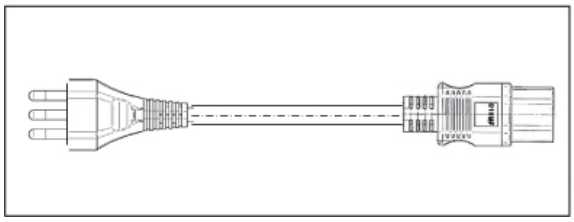
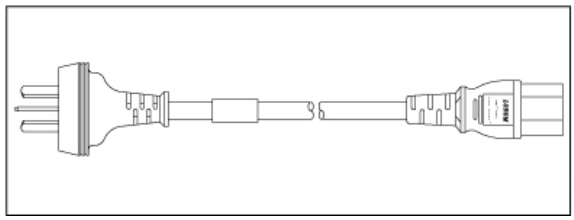


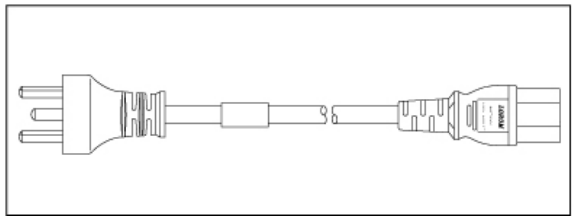
Table 31: AC power cords for Cisco C9550 Series Smart switches

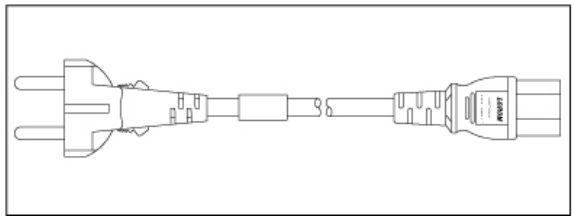
Locale	Part Number	Cordset Rating	Length	AC Source Plug Type
Australia	CAB-TA-AP	250 VAC, 15 A	2.5 m	**Figure 31: CAB-TA-AP= (Australia)**
Brazil	CAB-ACBZ-12A	250 VAC, 12 A	2.5 m	**Figure 32: CAB-ACBZ-12A= (Brazil)**
China	CAB-TA-CN	250 VAC, 10 A	2.5 m	**Figure 33: CAB-TA-CN= (China)**
Denmark	CAB-TA-DN	250 VAC, 10 A	2.5 m	**Figure 34: CAB-TA-DN= (Denmark)**
Europe	CAB-TA-EU	250 VAC, 10 A	2.5 m	**Figure 35: CAB-TA-EU= (Continental Europe)**
Israel	CAB-TA-IS	250 VAC, 16 A	2.5 m	



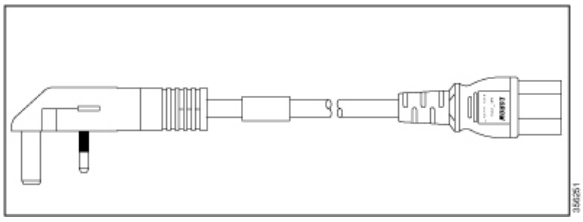
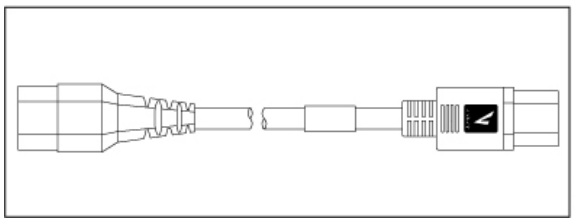








Locale	Part Number	Cordset Rating	Length	AC Source Plug Type
				Figure 36: CAB-TA-IS= (Israel)
Italy	CAB-TA-IT	250 VAC, 10 A	2.5 m	**Figure 37: CAB-TA-IT= (Italy)**
Japan	CAB-TA-250V-JP	250 VAC, 15 A	2.5 m	**Figure 38: CAB-TA-250V-JP= (Japan)**
North America	CAB-TA-NA	125 VAC, 15 A	2.5 m	**Figure 39: CAB-TA-NA= (North America)**
Switzerland	CAB-TA-SW	250 VAC, 16 A	2.5 m	**Figure 40: CAB-TA-SW= (Switzerland)**
Taiwan	CAB-AC-C15-TW	125 VAC, 15 A	2,5 m	-

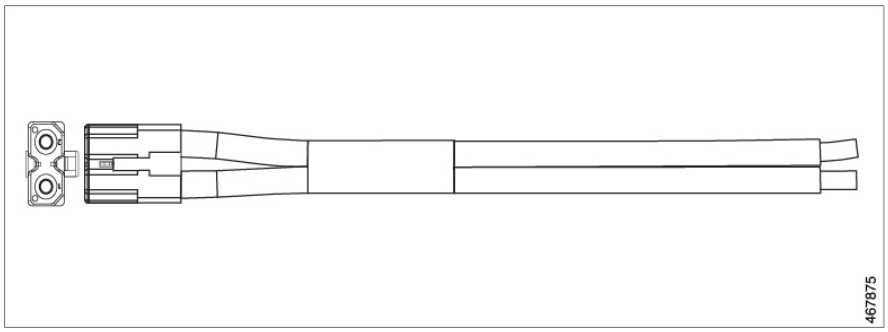
Locale	Part Number	Cordset Rating	Length	AC Source Plug Type
United Kingdom	CAB-TA-UK	250 VAC, 10 A	2.5 m	**Figure 41: CAB-TA-UK= (United Kingdom)** 
Cabinet jumper power cord,all countries except Japan	CAB-C15-CBN	250 VAC, 13 A	1.22 m	**Figure 42: CAB-C15-CBN=** 
Cabinet jumper power cord for China	CAB-C15-CBN-CN	250 V AC 13A	2.5 m	-
Cabinet jumper power cord for EU, Russian Federation,Belarus, Kazakhstan, and Australia	CAB-C15-CBN-EURA	250 V AC 13A	3 m	-
Cabinet jumper power cord for Taiwan	CAB-C15-TW	250 V AC 13A	2.5 m	-

DC power cord specifications

The DC power cords used with the C9550 series smart switches.

This section lists the power cords used with the DC power supplies.

Figure 43: PWR-2KW-DC-CBL



Connector Specifications

Information about 10/100/1000 ports and module connectors.

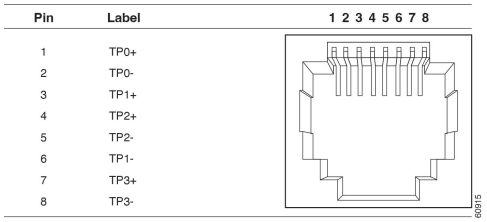
This section provides information about 10/100/1000 ports and module connectors.

10/100/1000 Ports

Describes the port pins.

All 10/100/1000 ports use standard RJ-45 connectors and Ethernet pinouts.

Figure 44: 10/100/1000 port pinouts



Module connectors

Provides information about the duplex and simplex LC cable connectors.

This section describes the different SFP/QSFP/QSFP-DD module connectors used on 10G/25G/40G/100G/400G ports on the switches.

Figure 45: Duplex LC cable connector

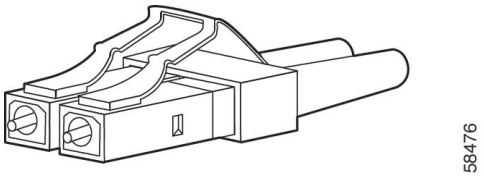


Figure 46: Simplex LC cable connector

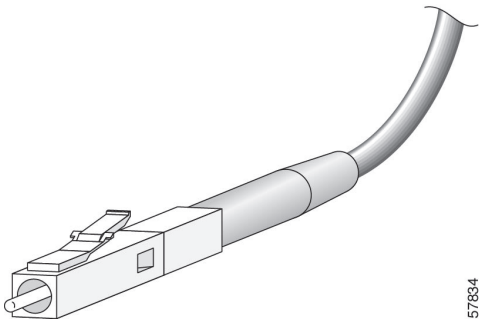
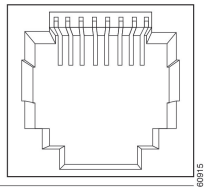


Figure 47: Copper SFP module LC connector

Pin	Label	1 2 3 4 5 6 7 8
1	TP0+	
2	TP0-	
3	TP1+	
4	TP2+	
5	TP2-	
6	TP1-	
7	TP3+	
8	TP3-	



Console cables

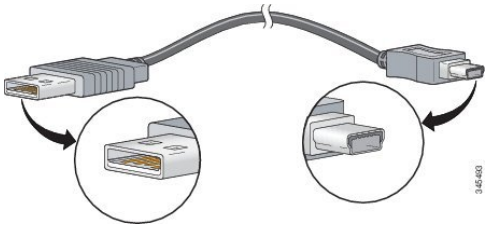
Describes the USB Type A to 5-pin mini-Type B (CAB-CONSOLE-USB) console cable.

This section provides information about the USB Type A to 5-pin mini-Type B (CAB-CONSOLE-USB) console cable.

The USB console port uses a USB Type A to 5-pin mini-Type B cable and a USB Type A to Type C cable.

These cables are not supplied with the switch; you have to order them separately.

Figure 48: USB Type A-to-USB 5-pin mini-Type B cable



The RJ-45 console port uses an 8-pin RJ-45 connection. The supplied RJ-45-to-DB-9 adapter cable is used to connect the console port of the switch to a console PC.

You need to provide an RJ-45-to-DB-25 female DTE adapter if you want to connect the switch console port to a terminal.

Cables and adapters

Provides information about the various types of cables and adapters for supporting transceivers.

This section provides information about the transceiver module network cables, cable pinouts, and console port adapter pinouts.

Transceiver module network cables

Provides links to the transceiver module installation notes.

For transceiver module installation notes, refer to

- *Cisco SFP and SFP+ Transceiver Module Installation Notes*
- *Cisco 40-Gigabit QSFP+ Transceiver Modules Installation Note*

Each port must match the wavelength specifications on the other end of the cable, and the cable must not exceed the stipulated cable length. Copper 1000BASE-T SFP module transceivers use standard four twisted-pair, Category 5 cable at lengths up to 328 feet (100 meters).

Cable pinouts

Illustrations that displays the cable pinouts.

A cable pinout refers to the specific arrangement of wires within a cable connector. Pinouts define how each pin is connected between the two ends of a cable.

Figure 49: Four twisted-pair straight-through cable schematic

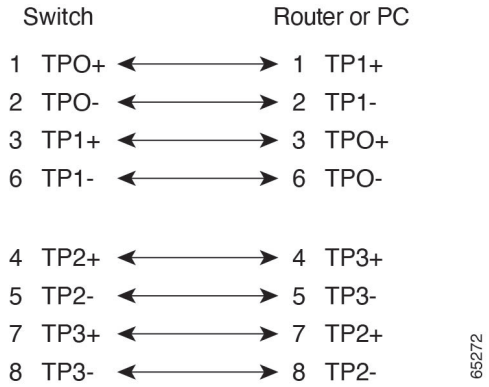


Figure 50: Four twisted-pair semi-cross cable schematic

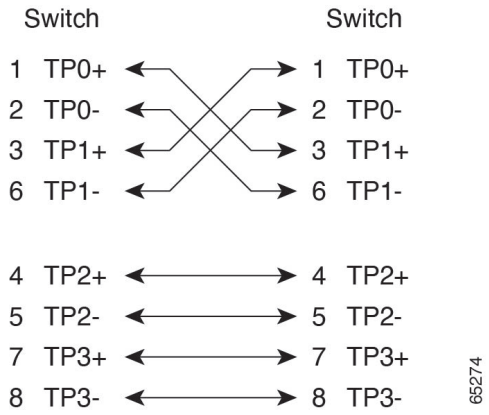


Figure 51: Two twisted-pair straight-through cable schematic

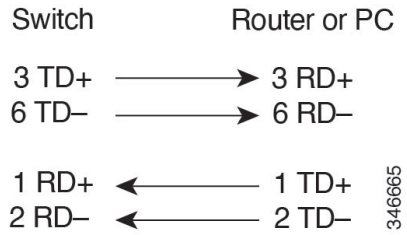
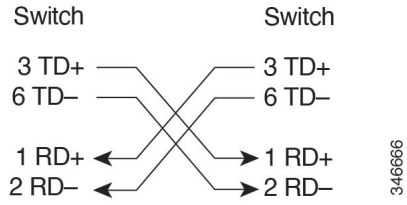


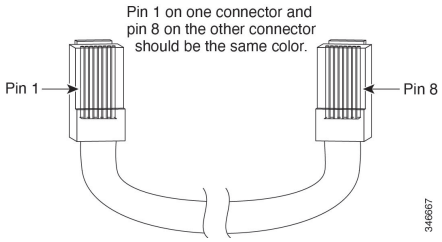
Figure 52: Two twisted-pair crossover cable schematic



Identifying a crossover cable

To identify a crossover cable, compare the two modular ends of the cable. Hold the cable ends side-by-side, with the tab at the back. The wire connected to the pin on the outside of the left plug should be a different color from the wire connected to the pin on the inside of the right plug.

Figure 53: Identifying a crossover cable



Console port adapter pinouts

Lists the console port adapter pinouts.

Use an RJ-45-to-DB-9 adapter cable to connect the switch console port to a console PC. You need to provide a RJ-45-to-DB-25 female DTE adapter to connect the switch console port to a terminal.

Table 32: Console port signaling with a DB-9 adapter

Switch console port (DTE)	RJ-45-to-DB-9 terminal adapter	Console device
Signal	**DB-9 Pin**	**Signal**
TxD	2	RxD
GND	5	GND
GND	5	GND
RxD	3	TxD

Table 33: Console port signaling with a DB-25 adapter

Switch console port (DTE)	RJ-45-to-DB-25 terminal adapter	Console device
Signal	**DB-25 pin**	**Signal**
TxD	3	RxD
GND	7	GND
GND	7	GND
RxD	2	TxD

The following table summarizes the ToD/1-PPS port pinouts.

Table 34: ToD pinouts

Pin	Signal Name	Direction	Description
1	RESERVED	Output or input	Do Not connect
2	RESERVED	Output or input	

Pin	Signal Name	Direction	Description
3	1PPS_N	Output	1PPS RS422 signal
4	GND	–	–
5		–	–
6	1PPS_P	Input	1PPS RS422 signal
7	TOD_N	Output or input	Time-of-Day R422 output or input signal
8	TOD_P	Output or input	Time-of-Day R422 output or input signal