Cisco N93216TC-FX2 NX-OS Mode Switch Hardware Installation Guide

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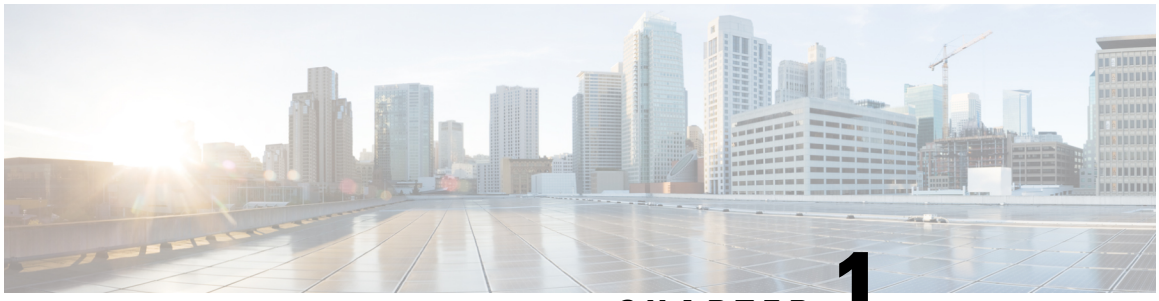


CHAPTER 1

Overview

• Overview, on page 1

Overview

The Cisco N9K-C93216TC-FX2 switch is a 2-rack unit (RU), fixed-port switch designed for deployment in data centers. This switch has the following ports:

- 96 100M/1G/10G RJ45 ports
- 12 40/100-Gigabit QSFP28 ports
- 2 management ports (one RJ-45 port and one SFP port)
- 1 console port
- 1 USB port

This switch includes these user-replaceable components:

- Fan modules (three) with the following airflow choices:
  - Port-side exhaust fan module with blue coloring (NXA-FAN-160CFM-PE)
  - Port-side intake fan module with burgundy coloring (NXA-FAN-160CFM-PI)

Note

Table 1: Fan Speeds for this Switch

	Port-Side Intake Fan Speed %	Port-Side Exhaust Fan Speed %
Typical/Minimum	40%	70%
Maximum	90%	90%

Note Each fan module has two rotors. The switch can function normally if one rotor inside the any one fan module fails. In case of more than one rotor failure, the switch will issue a warning and power down in 2 minute.

- Power supply modules (two—one for operations and one for redundancy [1+1]) with the following choices:
  - 1200-W port-side exhaust AC power supply with blue coloring (NXA-PAC-1200W-PE)
  - 1200-W port-side intake AC power supply with burgundy coloring (NXA-PAC-1200W-PI)
  - 1200-W HVAC/HVDC dual-direction airflow power supply with white coloring (N9K-PUV-1200W)
  - 930-W port-side exhaust DC power supply with blue coloring (NXA-PDC-930W-PE)
  - 930-W port-side intake DC power supply with burgundy coloring (NXA-PDC-930W-PI)

Note 930-W DC power supply support 1+1 redundancy requires both of the following conditions:

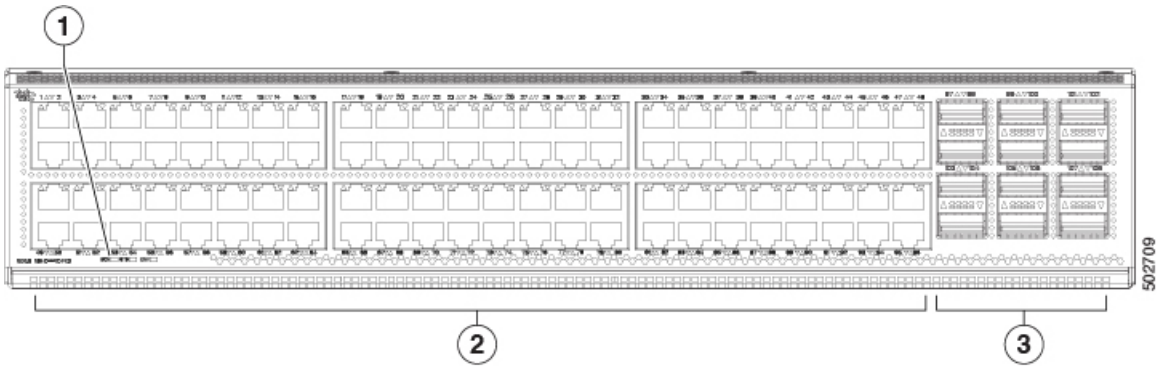
- Ambient temperature of 104°F (40℃) or less and
- Use of 3.5 W QSFP+ transceivers or passive QSFP cables

With higher temperatures or other optics, the switch requires both power supplies for operations without power redundancy.

Note Both power supplies should be the same type. Do not mix AC, DC, or HVAC/HVDC power supplies.

Note All fan modules and power supplies must use the same airflow direction. If you are using the 1200-W HVAC/HVDC power supplies, those power supplies automatically use the same airflow direction as used by the fan modules.

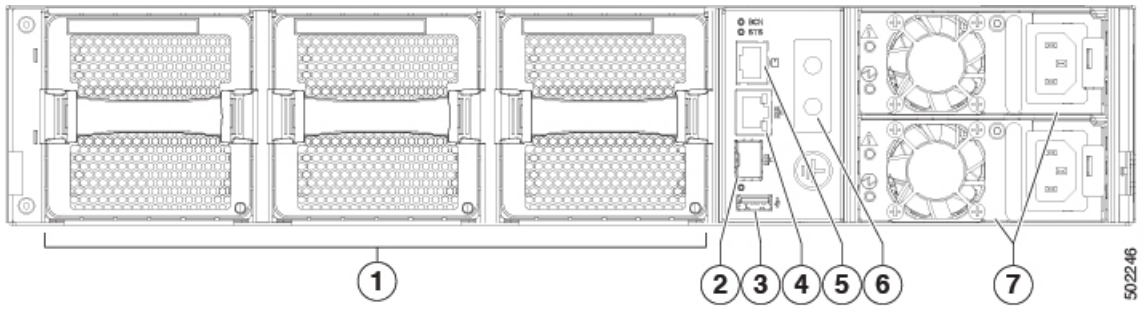
The figure shows the switch features on the port side of the chassis.



1	Beacon (BCN), Status (STS), and Environment (ENV) LEDs	3	12 40/100-Gigabit QSFP28 ports
2	96 100M/1G/10G RJ45 ports		

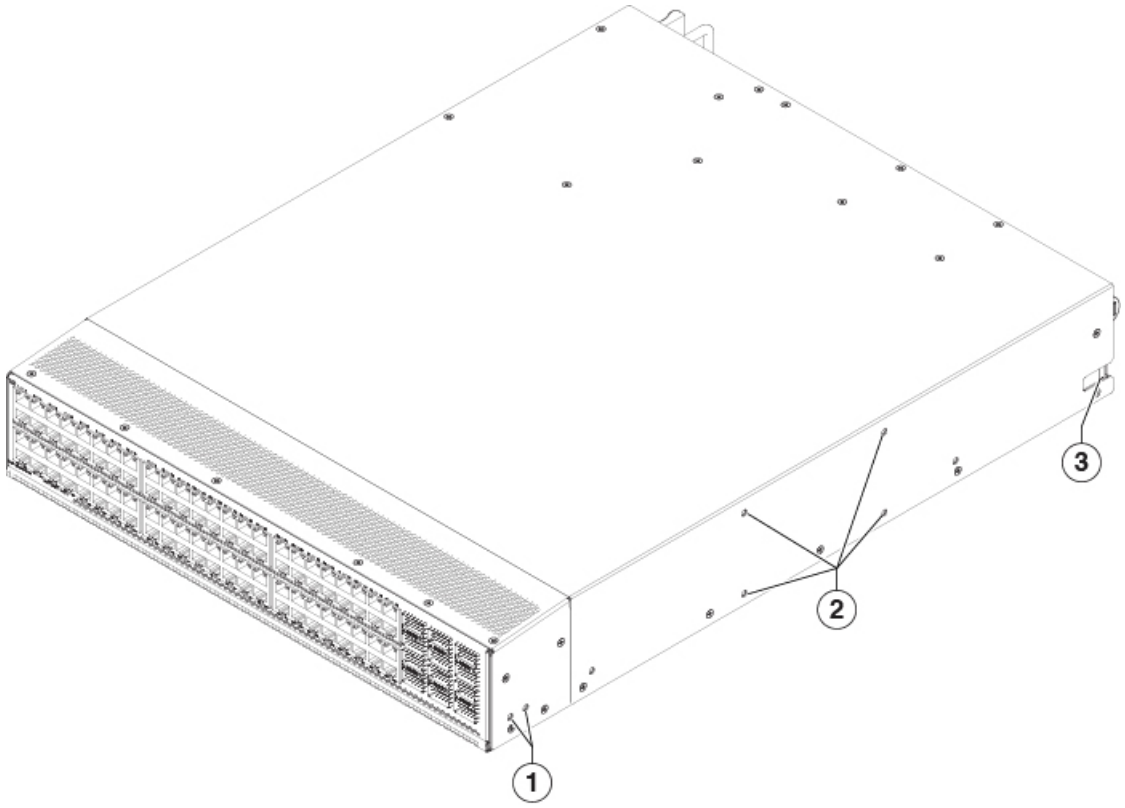
To determine which transceivers, adapters, and cables are supported by this switch, see the Cisco Transceiver Modules Compatibility Information document.

The figure shows the switch features on the power supply side of the chassis.



1	Fan modules (3) with slots numbered from 1 (left) to 3 (right)	5	Console port (1)
2	Management port (1—SFP optical port)	6	Grounding pad
3	USB port (1)	7	Power supply modules (1 or 2) (AC power supplies shown) with slots numbered 1 (top) and 2 (bottom)
4	Management port (1—RJ-45 copper port)		

The figure shows the side of the chassis.



1	Screw holes for front mounting brackets (four-post rack installations)	3	Notch on both sides of the chassis for locking the power supply end of the chassis to the bottom support rails (four-post rack installations).
2	Screw holes for center-mount bracket (two-post rack installations)		

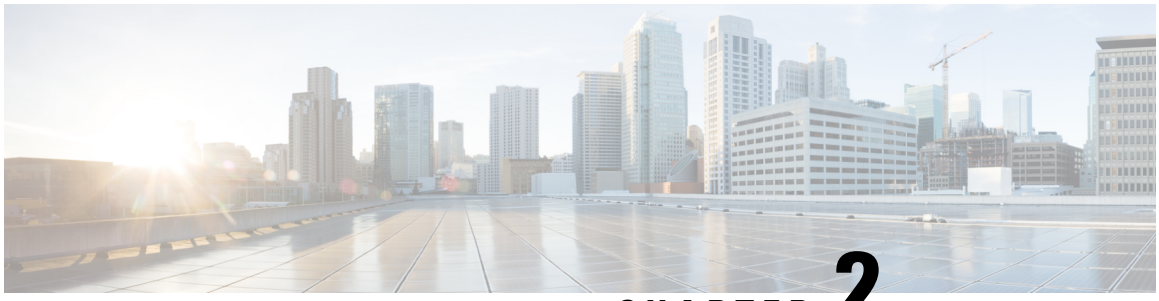
Note The access panel for DIMM upgrade is located on the underside of the chassis and uses Philips flat-head screws, M3x0.5x5mmL, CSwZNwPCH,121'.

Depending on whether you plan to position the ports in a hot or cold aisle, you can order the fan and power supply modules with port-side intake or port-side exhaust airflow. For port-side intake airflow, the fan and AC power supply modules have burgundy coloring. For port-side exhaust airflow, the fan and AC power supplies have blue coloring. You can also order the 1200-W HVAC/HVDC power supply which has dual-direction airflow with white coloring. Dual-direction airflow modules automatically use the airflow direction of the other modules installed in the switch.

The fan and power supply modules are field replaceable and you can replace one fan module or one power supply module during operations so long as the other modules are installed and operating. If you have only one power supply installed, you can install the replacement power supply in the open slot before removing the original power supply.

Note All of the fan and power supply modules must have the same direction of airflow. Otherwise, the switch can overheat and shut down. If you are installing a dual-direction power supply, that module will automatically use the same airflow direction as the other modules in the switch.

Caution If the switch has port-side intake airflow (burgundy coloring for fan modules), you must locate the ports in the cold aisle. If the switch has port-side exhaust airflow (blue coloring for fan modules), you must locate the ports in the hot aisle. If you locate the air intake in a hot aisle, the switch can overheat and shut down.



CHAPTER 2

Preparing the Site

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Temperature Requirements

The operating temperature of the switch is 32 to 104 degrees Fahrenheit (0 to 40 degrees Celsius) at sea level. For every 300 meters (1000 feet) above sea level, the maximum temperature is reduced by 1 degree Celsius. The non-operating temperature of the switch is -40 to 158 degrees Fahrenheit (-40 to 70 degrees Celsius).

Overview of Module Temperatures

Built-in, automatic sensors in all switches in the Cisco N9000 Series monitor your switch at all times. Each module (supervisor, I/O, and fabric) has temperature sensors with two thresholds:

Note For any Major temperature alarms from the sensors, the switch powers down in 2 minutes. Power on the switch after fixing the temperature issue.

- Minor temperature threshold—If exceeded, a minor alarm occurs and these actions happen for all four sensors:
  - System messages display.
  - System sends Call Home alerts (if configured).

- System sends SNMP notifications (if configured).
- System fan speed will increment.

- Major temperature threshold—If exceeded, a major alarm occurs and these actions happen:

  If the threshold is exceeded in a switching module, only that module is shut down.

  For all sensors:

  - System messages display.
  - System sends Call Home alerts (if configured).
  - System sends SNMP notifications (if configured).
  - System fan speed will increment.
  - If the major threshold is exceeded in a switching module, only that module is shut down.
  - If the major threshold is exceeded in an active supervisor module with HA-standby or standby present, only that supervisor module is shut down and the standby supervisor module takes over.
  - If you do not have a standby supervisor module in your switch, you have 2 minutes to decrease the temperature. During this interval, the software monitors the temperature every 5 seconds and continuously sends system messages every 10 seconds, as configured.

Humidity Requirements

Climate-controlled buldings usually maintain an acceptable level of humidity for the switch equipment. If the switch is located in an unusually humid location, use a dehumidifier to maintain the humidity within an acceptable range.

Altitude Requirements

Altitude rating is 10,000 ft (3048 m). For China, it is 6,562 ft (2000 m).

Dust and Particulate Requirements

Exhaust fans cool power supplies. System fans cool switches by drawing in air and exhausting air out through various openings in the chassis. Fans also introduce dust and other particles, causing contaminant buildup in the switch and increased internal chassis temperature. Dust and particles can act as insulators and interfere with the mechanical components in the switch. Keep a clean operating environment to reduce the negative effects of dust and other particles.

In addition to keeping your environment free of dust and particles, use these precautions to avoid contamination of your switch:

- Do not smoke near the switch.
- Do not eat or drink near the switch.

Minimizing Electromagnetic and Radio Frequency Interference

Electromagnetic interference (EMI) and radio frequency interference (RFI) from the switch can adversely affect other devices, such as radio and television (TV) receivers. Radio frequencies that emanate from the switch can also interfere with cordless and low-power telephones. Conversely, RFI from high-power telephones can cause spurious characters to appear on the switch monitor.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the switch to other devices through the power cable and power source or through the air as transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI that are emitted by computing equipment. Each switch meets these FCC regulations.

To reduce the possibility of EMI and RFI, use these guidelines:

- Cover all open expansion slots with a blank filler plate.
- Always use shielded cables with metal connector shells for attaching peripherals to the switch.

When wires are run for any significant distance in an electromagnetic field, interference can occur to the signals on the wires with these implications:

- Bad wiring 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 prevent strong EMI, consult experts in radio frequency interference (RFI).

The wiring is unlikely to emit radio interference if you use a twisted-pair cable with a good distribution of grounding conductors. Copper cables should not be longer than maximum distances for the media type.

Caution 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 that is caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic switches. Consult experts in electrical surge suppression and shielding if you have had similar problems in the past.

Shock and Vibration Requirements

The switch has been shock- and vibration-tested for operating ranges, handling, and earthquake standards.

Preventing Electrostatic Discharge Damage

Many switch components can be damaged by static electricity. Not exercising the proper electrostatic discharge (ESD) precautions can result in intermittent or complete component failures. To minimize the potential for ESD damage, always use an ESD-preventive anti-static wrist strap (or ankle strap) and ensure that it makes adequate skin contact.

Note Check the resistance value of the ESD-preventive strap periodically. The measurement should be 1–10 megohms. Before you perform any of the procedures in this guide, attach an ESD-preventive strap to your wrist and connect the leash to the chassis.

Grounding Requirements

The switch is sensitive to variations in voltage that is supplied by the power sources. Overvoltage, undervoltage, and transients (spikes) can erase data from memory or cause components to fail. To protect against these types of problems, ensure that there is an earth-ground connection for the switch.

Connect the grounding pad on the switch either directly to the earth-ground connection or to a fully bonded and grounded rack.

When the chassis is properly installed in a grounded rack, the switch is grounded because it has a metal-to-metal (no paint, stain, dirt, or anything else on it) contact to the rack. See Note to ensure proper conductivity between rack and switch is maintained.

Alternatively, ground the chassis by using a customer-supplied grounding cable that meets your local and national installation requirements. For U.S. installations, we recommend 6-AWG wire. Connect your grounding cable to the chassis with a grounding lug (provided in the switch accessory kit) and to the facility ground.

Note Create 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. Provide electrical continuity by using 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.

Planning for Power Requirements

The switch includes two power supplies (1-to-1 redundancy with current sharing) in one of these combinations:

- Two 1200-W AC power supplies
- Two 1200-W HVAC/HVDC power supplies
- Two 930-W DC power supplies

Note For 1+1 redundancy, you must use two power sources and connect each power supply to a separate power source.

The power supplies are rated to output up to 1200 W (AC and HVAC/HVDC power supplies) to the switch, but the switch requires less than that amount of power from the power supply. To operate the switch, you must provision enough power from the power source to cover the requirements of both the switch and a power supply. Typically, this switch and a power supply require about 429 W of power input from the power source, but you must provision as much as 1245 W power input from the power source to cover peak demand.

Note Some of the power supply modules have rating capabilities that exceed the switch requirements. When calculating your power requirements, use the switch requirements to determine the amount of power that is required for the power supplies.

Note In any power redundancy mode, the total power is shared across the populated Power Supply Units (PSUs). Multiple PSUs are always load-sharing regardless of the mode used. If a PSU has an active input power, the PSU provides a fraction of the total power to the system. This ensures that all active power supplies contribute to the power load, sharing it proportionally to maintain power redundancy.

To minimize the possibility of circuit failure, verify that each power-source circuit that is used by the switch is dedicated to the switch.

Warning **Statement 1005—**Circuit Breaker when using DC power supplies

This product relies on the building's installation for short-circuit (overcurrent) protection.

- Ensure that the protective devices are rated not greater than 30A when the switch is powered with regular DC power supplies (rated 48-60VDC).
- Ensure that the protective devices are rated not greater than 10A when the switch is powered with HVDC power supplies (rated 240-350VDC).

Airflow Requirements

The switch is positioned with its ports in either the front or the rear of the rack, depending on your cabling and maintenance requirements. To identify the airflow options for your switch, see the user-replaceable components in the *Overview* section of this document. Position the fan and power supply modules to move the coolant air from the cold aisle to the hot aisle in one of these ways:

- Port-side exhaust airflow—Cool air enters the chassis through the fan and power supply modules in the cold aisle and exhausts through the port end of the chassis in the hot aisle.

- Port-side intake airflow—Cool air enters the chassis through the port end in the cold aisle and exhausts through the fan and power supply modules in the hot aisle.
- Single-direction airflow—The direction of the installed fan modules determines the airflow.

Identify the airflow direction of each fan and power supply module by its coloring.

Note To prevent the switch from overheating and shutting down, position the air intake for the switch in a cold aisle. The fan and power supply modules must have the same direction of airflow. To change the airflow direction for the switch, shutdown the switch before changing the modules.

Rack and Cabinet Requirements

Install these types of racks or cabinets for your switch:

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom-to-top cooling)
- Standard open four-post Telco racks

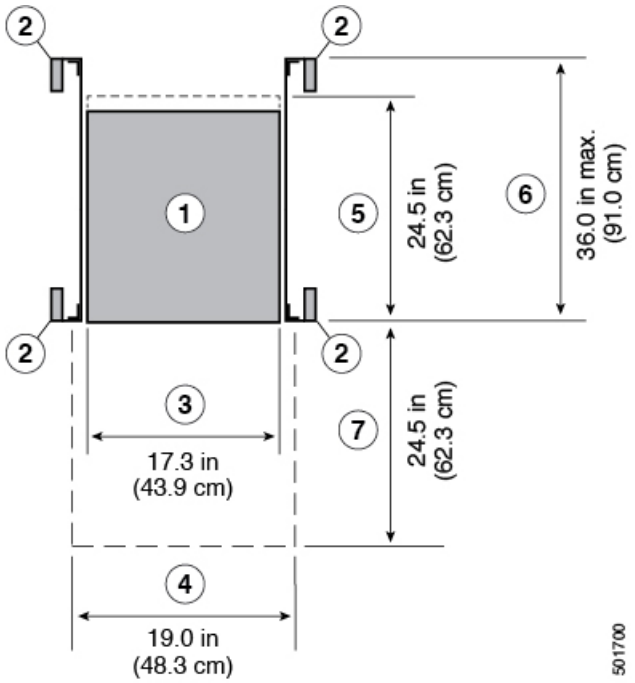
Work with your cabinet vendors to determine which of their cabinets meet these requirements or see the Cisco Technical Assistance Center (TAC) for recommendations:

- Use a standard 19-inch (48.3-cm), four-post Electronic Industries Alliance (EIA) cabinet or rack with mounting rails that conform to English universal hole spacing per section 1 of the ANSI/EIA-310-D-1992 standard.
- The depth of a four-post rack must be 24 to 32 inches (61.0 to 81.3 cm) between the front and rear mounting rails (for proper mounting of the bottom-support brackets or other mounting hardware).

Also, you must have power receptacles that are located within reach of the power cords that are used with the switch.

Clearance Requirements

Provide the chassis with adequate clearance between the chassis and any other rack, device, or structure so that you can properly install the switch. Provide the chassis with adequate clearance to route cables, provide airflow, and maintain the switch. For the clearances required for an installation of this chassis in a four-post rack, see the figure.



1	Chassis	5	Depth of the chassis
2	Vertical rack-mount posts and rails	6	Maximum extension of the bottom-support rails 36.0 in (91.4 cm)
3	Chassis width 17.3 in (43.9 cm)	7	Depth of the front clearance area (equal to the depth of the chassis).
4	Width of the front clearance area (equal to the width of the chassis with two rack-mount brackets that are attached to it). 19.0 in (48.3 cm)		

Note Both the front and rear of the chassis must be open to both aisles for airflow.

Network Equipment-Building System (NEBS) Statements

The regulatory compliance statements and requirements for the Network Equipment Building System (NEBS) certification are listed here.

Note **Statement 7001—**ESD Mitigation

This equipment may be ESD sensitive. Always use an ESD ankle or wrist strap before handling equipment. Connect the equipment end of the ESD strap to an unfinished surface of the equipment chassis or to the ESD jack on the equipment if provided.

Warning **Statement 7003—**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:

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:

Warning **Statement 7005—**Intrabuilding Lightning Surge and AC Power Fault

The intrabuilding port(s) of the equipment or subassembly is suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding port(s) of the equipment or subassembly MUST NOT be metallically connected to interfaces that connect to the OSP or its wiring for more than 6 meters (approximately 20 feet). These interfaces are designed for use as intrabuilding interfaces only (Type 2, 4, or 4a ports as described in GR-1089) 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.

The following ports are considered intrabuilding ports on the equipment:

Warning **Statement 7012—**Equipment Interfacing with AC Power Ports

Connect this equipment to AC mains that are provided with a surge protective device (SPD) at the service equipment that complies with NFPA 70, the National Electrical Code (NEC).

Note **Statement 7013—**Equipment Grounding Systems—Common Bonding Network (CBN)

This equipment is suitable for installations using the CBN.

Note **Statement 7015—**Equipment Bonding and Grounding

When you use thread-forming screws to bond equipment to its mounting metalwork, remove any paint and nonconductive coatings and clean the joining surfaces. Apply an antioxidant compound before joining the surfaces between the equipment and mounting metalwork.

Note **Statement 7016—**Battery Return Conductor

Treat the battery return conductor of this equipment as

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

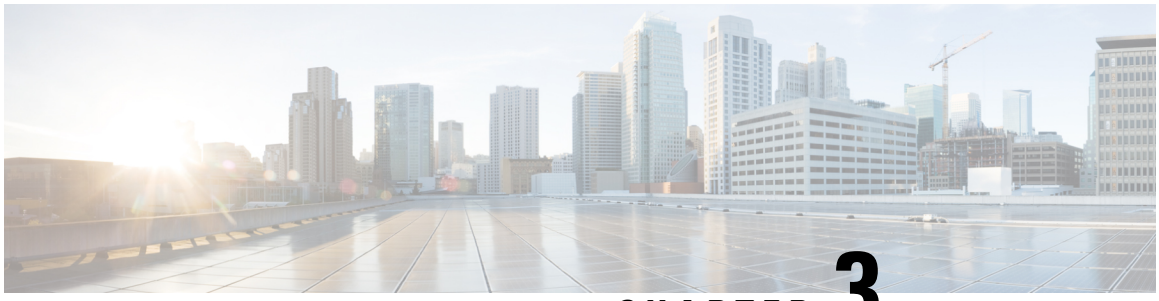
This equipment is suitable for installation in locations where the NEC applies.

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 1255—**Laser Compliance Statement

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



CHAPTER 3

Installing the Chassis

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Safety

Before you install, operate, or service the switch, see the *Regulatory, Compliance, and Safety Information for the Cisco N9000 Series* content for important Safety Information.

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 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 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 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

接続ケーブル、電源コードセット、**AC**アダプタ、バッテリなどの部品は、必ず添付品または指定品をご使用ください。添付品・指定品以外をご使用になると故障や動作不良、火災の原因となります。また、電源コードセットは弊社が指定する製品以外の電気機器には使用できないためご注意ください。

Warning **Statement 1017—**Restricted Area

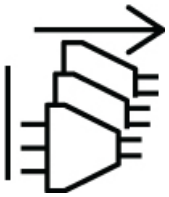
This unit is intended for installation in restricted access areas. Only skilled, instructed, or qualified personnel can access a restricted access area.

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

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

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

Warning **Statement 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.

Caution To prevent loss of input power, ensure the total maximum loads on the circuits supplying power to the switch are within the current ratings for the wiring and breakers.

Note For AC input application, please refer to the statement below:

Warning **Statement 1005**—Circuit Breaker

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective devices is rated not greater than 20A (North America), 16A (Europe), and 13A (UK).

Installation Options with Rack-Mount Kits

The rack-mount kit enables you to install the switch into racks of varying depths. Position the switch with easy access to either the port connections or the fan and power supply modules.

Install the switch using these rack-mount options:

- Rack-mount kit (NXK-ACC-RMK-2RU) which you can order from Cisco. This option offers you easy installation, greater stability, increased weight capacity, added accessibility, and improved removability with front and rear removal.

  For four post racks.

- Rack-mount kit (N9K-C9300-RMK) which you can order from Cisco.

  For four post racks.

The rack or cabinet that you use must meet the requirements listed the in General Requirements for Cabinets and Racks, on page 55 section.

Note You are responsible for verifying that your rack and rack-mount hardware comply with the guidelines that are described in this document.

Install a Rack

Before you install the switch, you must install a standard four-post, 19-inch EIA data center rack (or a cabinet that contains such a rack) that meets the requirements listed in Overview of Racks, on page 55.

Procedure

Step 1 Bolt the rack to the concrete subfloor before moving the chassis onto it.

Warning
Statement 1048—Rack Stabilization

The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before installation or servicing. Failure to stabilize the rack can cause bodily injury.

Step 2 If the rack has bonded construction, connect it to the earth ground. This action enables you to easily ground the switch and its components and to ground your electrostatic discharge (ESD) wrist strap to prevent damaging discharges when you handle ungrounded components before installing them.

Step 3 Include one or two power sources at the rack. For AC power, provide a power receptacle.

Step 4 Include one or two power sources at the rack. For DC power, provide a circuit breaker with terminals for connecting power cables.

Warning
Statement 1018—Supply Circuit

To reduce risk of electric shock and fire, take care when connecting units to the supply circuit so that wiring is not overloaded.

Note
If you are not using power redundancy or are using *n*+1 redundancy, you need only one power source. If you are using *n*+*n* redundancy, you need two power sources.

Unpacking and Inspecting a New Switch

Before you install a new chassis, unpack and inspect it to be sure that you have all the items that you ordered. Verify that the switch was not damaged during shipment. If anything is damaged or missing, contact your customer representative immediately.

Caution When you handle the chassis or its components, follow ESD protocol at all times to prevent ESD damage. This protocol includes but is not limited to wearing an ESD wrist strap that you connect to the earth ground.

Tip Do not discard the shipping container when you unpack the switch. Flatten the shipping cartons and store them. If you need to move or ship the system in the future, you will need this container.

Procedure

Step 1 Compare the shipment to the equipment list that is provided by your customer service representative. Verify that you have received all of the ordered items.

The shipment should include:

- Switch chassis, which includes these installed components:
  - Two power supplies (any combination of these, with the airflow direction being the same as for the fan modules):
  - fan modules (all fan and power supply modules must have the same airflow direction)
- Switch accessory kit

Step 2 Check the contents of the box for damage.

Step 3 If you notice any discrepancies or damage, send this information to your customer service representative by email:

- Invoice number of the shipper (see the packing slip)
- Model and serial number of the missing or damaged unit
- Description of the problem and how it affects the installation

Planning How to Position the Chassis in the Rack

The switch is designed so that you can have coolant air flow through the switch in one of the two following directions:

- Enter the port side and exhaust out the power supply side (port-side intake airflow)
- Enter the power supply side and exhaust out the port side (port-side exhaust airflow)

For port-side intake airflow, the switch must have port-side intake fan and AC power supply modules with one or more of the following colorings:

- Burgundy coloring on fan modules and AC power supplies

For port-side exhaust airflow, the switch must have port-side exhaust fan and AC power supply modules with one or more of the following colorings:

- Blue coloring on fan modules and AC power supplies

You can plan the positioning of the switch so that its ports are located close to ports on connected devices or so that the fan and power supply modules are conveniently located in a maintenance aisle, and then order the modules that move coolant air in the appropriate direction from the cold aisle to the hot aisle.

Note All fan and power supply modules in the same switch must operate with the same direction of airflow and the air intake portion of the switch must be located in a cold aisle.

Installing the Chassis in a Two-Post Rack

Before you install the chassis, be sure that the rack is fully secured to the data center floor.

You must attach mounting brackets to the chassis before mounting the chassis.

Attaching Center-Mount Brackets to the Chassis

Attach a right-angled bracket to each side of the chassis. This bracket centers the chassis and secures it in place on a two-post rack.

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

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

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

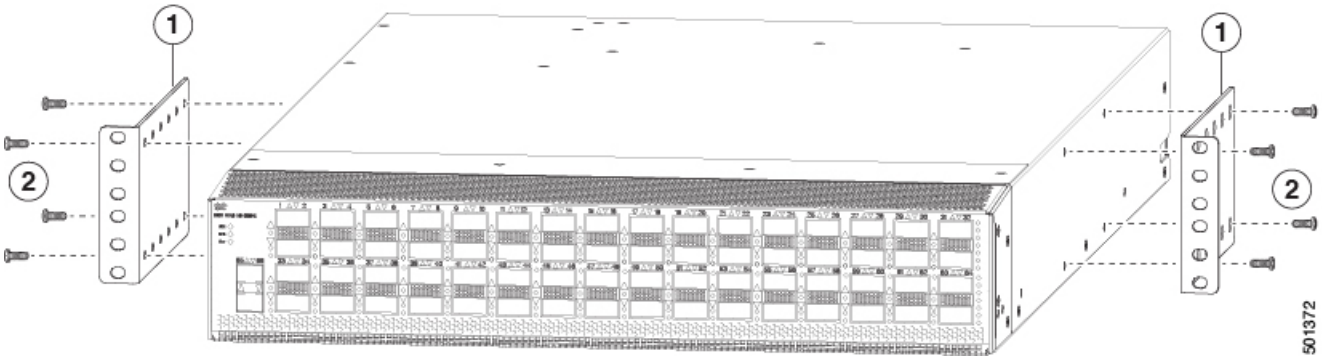
Before you begin

- Separately order the center-mount brackets if you are installing the chassis in a two-post rack. These brackets do not ship with the chassis unless you specifically order them.
- Gather these tools and equipment:
  - Manual Phillips-head torque screwdriver
  - Center-mount bracket kit

Procedure

Step 1 Align one of the two center-mount brackets on the left or right side of the chassis and be sure that the angled portion is facing the front of the chassis.

Align four of the screw holes on the larger side of the bracket with the four screw holes near the center of the left or right side of the chassis.



1	Center-mount bracket with its larger side facing the chassis and the longer side facing the front (port side) of the chassis. Align four screw holes in the bracket to four screw holes in the side of the chassis.	2	Four M4 x 8 mm screws used to fasten the bracket to the chassis.

Step 2 Use four M4 x 8 mm screws to attach the bracket to the chassis. Tighten each screw to 11 to 15 in-lb (1.2 to 1.7 N·m).

Step 3 Repeat Steps 1 and 2 to attach the second center-mount bracket to the other side of the chassis.

What to do next

Mount the chassis to the two-post rack.

Installing the Chassis in a Two-Post Rack

Position the chassis near the top of the rack with the power supply and fan modules in the appropriate aisle for their required airflow. If the fan modules have a blue coloring for port-side exhaust airflow, position the modules by the cold aisle. If the fan modules have a burgundy coloring for port-side intake airflow, position the modules by the hot aisle.

Note Power supply modules must have the same airflow direction as the fan modules.

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

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

Warning **Statement 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.

Before you begin

- Make sure that the two-post rack is properly installed and secured to the concrete subfloor.
- Make sure that two center-mount brackets are securely fastened to the middle of each side of the chassis.
- Make sure that you have six customer-supplied rack-mount screws (typically M6 x 10 mm or the appropriate screw for the vertical mounting rails on the rack).
- You have at least two people to install the chassis.

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

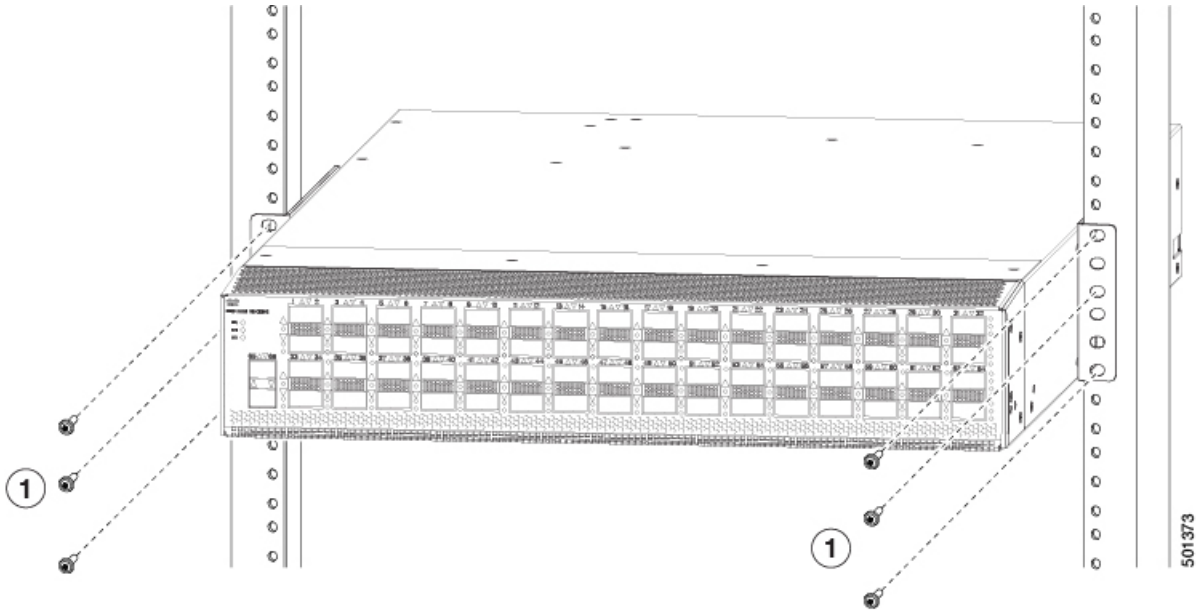
To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. Follow these guidelines to ensure your safety:

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

Procedure

Step 1 Use one person to position the chassis so that it is near the top of the rack with the fan and power supply modules in the appropriate aisle and the center-mount bracket has its screw holes aligned to screw holes on the two-post rack.

If these modules have a blue coloring for port-side exhaust airflow, then you must position the modules by the cold aisle. If the modules have a burgundy coloring for port-side intake airflow, you must position the modules by the hot aisle.



1	Three customer-supplied screws (typically M6 x 10 mm screws or the appropriate screws for the rack) to hold each side of the chassis to the two-post rack.		

Step 2 Use the second person to secure the three customer-supplied rack-mount screws (typically M6 x 10 mm or other appropriate screws for the rack) on each center-mount bracket to attach the chassis to the rack. Tighten each screw to the appropriate torque setting for the screws (for M6 x 10 mm screws, use 40 in-lbs [4.5 N·m] of torque).

Installing the Chassis in a Four-Post Rack

Before you install the chassis, be sure that the rack is fully secured to the data center floor.

The table lists the items contained in the rack-mount kit.

Installing the Switch using the NXK-ACC-RMK-2RU Rack-Mount Kit

To install the switch, you must attach mounting brackets to the rack, install slider rails on the rear of the rack, slide the switch onto the slider rails, install the retainer brackets, and secure the switch to the rack with the retainer clips. Typically, the front of the rack is the side easiest to access for maintenance.

Note You must supply the eight 10-32 or 12-24 screws required to mount the slider rails and switch to the rack.

Before you begin

- You have inspected the switch shipment to ensure that you have everything ordered.
- Make sure that the switch rack-mount kit includes the following parts:
  - Rack-mount brackets (2)
  - Rack-mount retainer brackets (2)
  - Rack-mount slider rails (2)
  - Rack-mount retainer clips (2)
  - Phillips countersink screws (8)
  - Flat head screws (4)
- The rack is installed and secured to its location.

Procedure

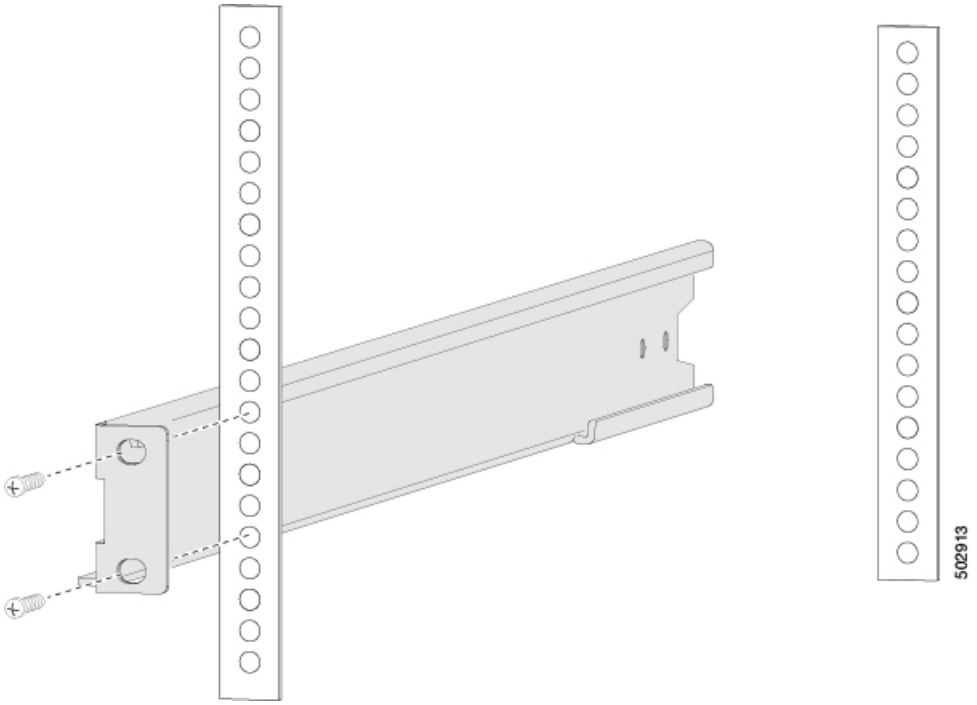
Step 1 Install two rack-mount brackets to the rack as follows:

a) 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 front-mount brackets so that the switch ports will be in the cold aisle.

- If the switch has port-side exhaust modules (fan modules with blue coloring), position the front-mount brackets so that the switch fan and power supply modules will be in the cold aisle.

b) Position a front-mount bracket so that it aligns to the desired position in the rack and secure the bracket with 12-24 screws or 10-32 screws, depending on the rack thread type (see the following figure). Tighten 12-24 screws to 30 in-lb (3.39 N·m) of torque and tighten 10-32 screws to 20 in-lb (2.26 N·m) of torque..



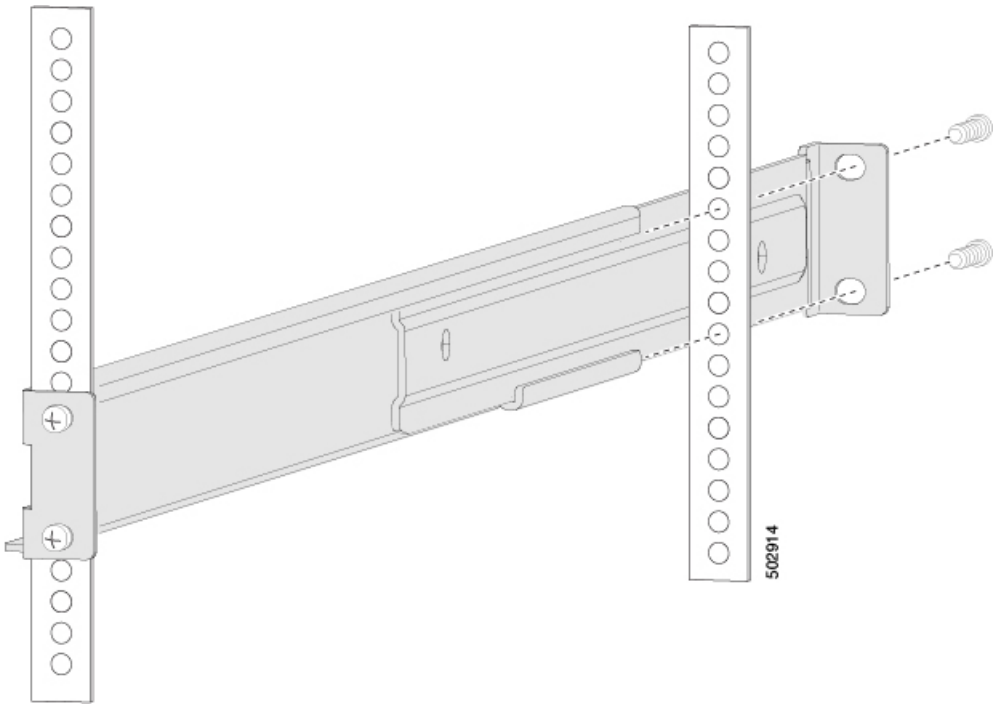
c) Repeat Step 1 for the other front rack-mount bracket on the other side of the rack and be sure to position that bracket horizontally to the same level as first bracket.

Step 2 If you are not installing the chassis into a grounded rack, you must attach a customer-supplied grounding wire to the chassis as explained in Grounding the Chassis, on page 38. If you are installing the chassis into a grounded rack, you can skip this step.

Step 3 Install the slider rails on the rack or cabinet as follows:

a) Determine which two posts of the rack or cabinet you should use for the slider rails. Of the four vertical posts in the rack or cabinet, two will be used for the front mount brackets attached to the easiest accessed end of the chassis, and the other two posts will have the slider rails.

b) Position a slider rail at the desired level on the back side of the rack and slide it into the front-mount bracket already installed and secure with 12-24 screws or 10-32 screws, depending on the rack thread type (see the following figure). Tighten 12-24 screws to 30 in-lb (3.39 N·m) of torque and tighten 10-32 screws to 20 in-lb (2.26 N·m) of torque.

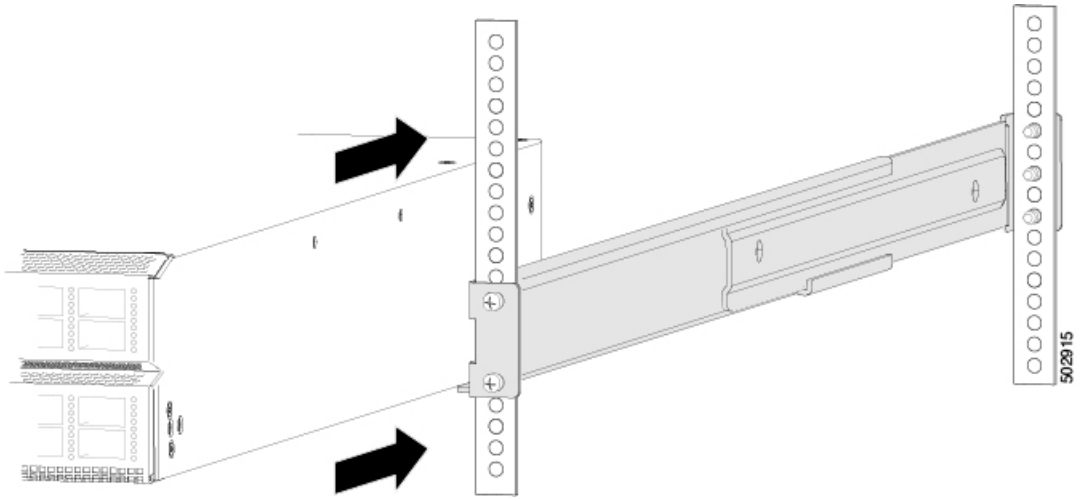


c) Repeat Step 3 to attach the other slider rail to the other side of the rack.

To make sure that the slider rails are at the same level, you should use a level tool, tape measure, or carefully count the screw holes in the vertical mounting rails.

Step 4 Insert the switch into the rack and attach it as follows:

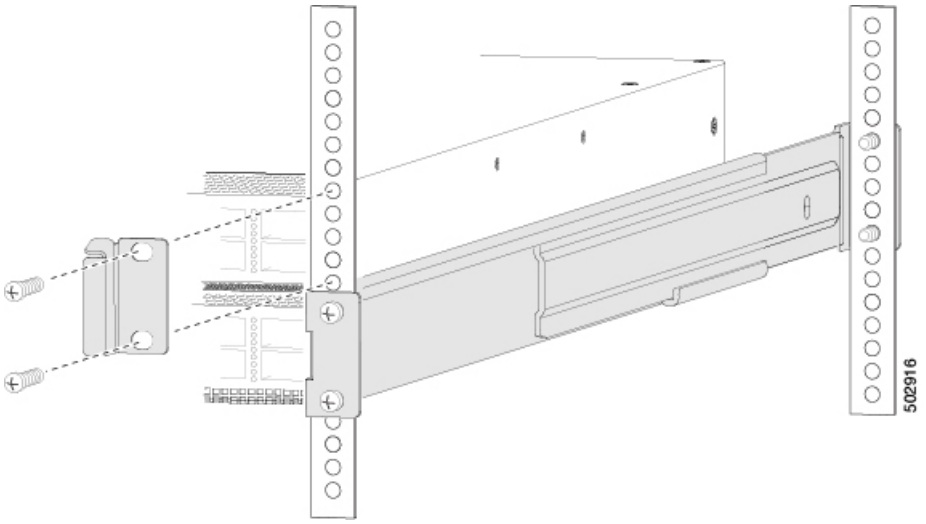
a) Holding the switch with both hands, position the switch onto the rack-mount brackets and carefully slide the chassis into the rack (see the following figure).



Step 5 Insert the rack-mount retainer brackets

a) Align the retainer brackets to the front of the chassis, being careful not to damage anything on the front of the chassis (see the following figure).

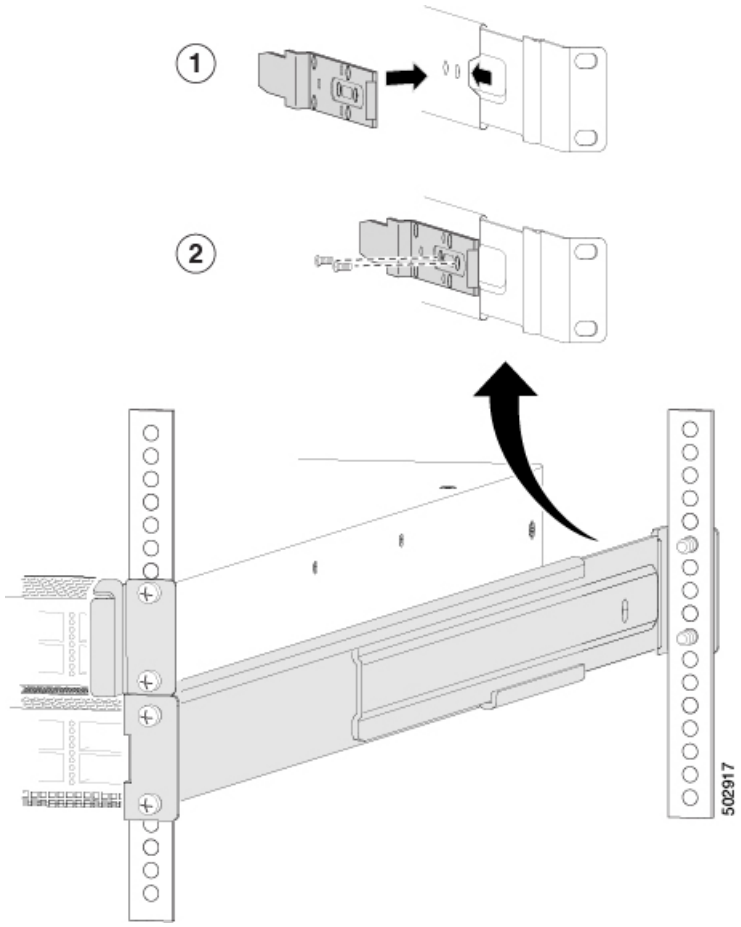
b) Repeat Step 5 to attach the other retainer bracket on other side of the chassis.



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).

Step 6 Insert the retainer clip to hold the chassis in place.

a) Align the retainer clip to the inside of the back of the slider rail. Make sure to hook the flange to the cutout on the bracket and align the screw holes (see the following figure).
b) Attach the screws to secure the retainer clip (see the following figure).
c) Repeat Step 6 to attach the other retainer clip on the other side of the chassis.



Step 7 If you attached a grounding wire to the chassis grounding pad, connect the other end of the wire to the facility ground.

Installing the Switch using the N9K-C9300-RMK Rack-mount Kit

Attaching the Bottom-Support Rails to the Rack

The switch chassis that you are installing ships with two adjustable bottom-support rails that you can attach to a four-post rack to hold the chassis. Each of these bottom-support rails has two pieces—one that slides into the other so that you can adjust them to fit racks with front and rear mounting posts that are spaced less than 36 inches (91 cm). On each bottom-support rail, the rail half that slides into the other rail includes a chassis stop that fits into the module end of the chassis. Depending on direction of the chassis airflow, position the rail half with the chassis stop so that the fan and power supply modules end up in the appropriate aisle as follows:

- Port-side intake (burgundy coloring for fan modules) airflow requires that the bottom-support rail with the chassis stop be located on the hot aisle side of the rack.
- Port-side exhaust (blue coloring for fan modules) airflow requires that the bottom-support rail with the chassis stop be located on the cold aisle side of the rack.

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.

Before you begin

Before you can install the bottom support rails for the chassis, do this:

- Verify that a four-post rack or cabinet is installed.
- If any other devices are stored in the rack or cabinet, verify that the heavier switches are installed below lighter switches.
- Verify that the bottom-support rails kit is included in the switch accessory kit.
- Verify that you have 8 screws for attaching the bottom support brackets to the racks (typically M6 x 10 mm screws or the screw appropriate for the vertical mounting rails on the rack.

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

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

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

Procedure

Step 1 Look at the fan and power supply modules installed in the chassis to determine how you must position the bottom-support rails on the rack.

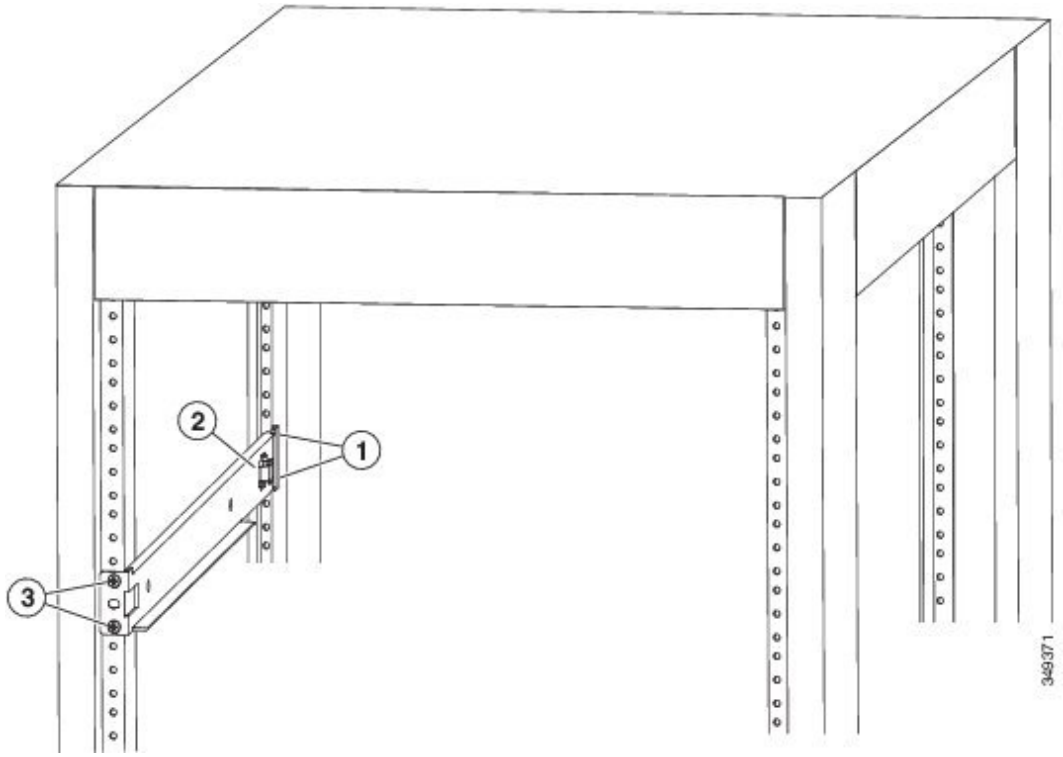
- If the fan modules have blue coloring (port-side exhaust modules), position the bottom support rails so that the chassis stop is positioned by the cold aisle.
- If the fan modules have burgundy (port-side intake modules), position the bottom support rails so that the chassis stop is positioned by the hot aisle.

Step 2 Separate the two sliders that make up one bottom-support rail and position the half with the chassis stop by the appropriate aisle for the fan and power supply modules. Leave at least 1 rack unit open above the bottom-support rails so that you can easily install the chassis.

Step 3 Use two customer-supplied screws (typically M6 x 10 mm screws) to attach the bottom-support rail half to the vertical mounting rails on the rack post. Tighten each screw to the appropriate torque setting for the screws (for M6 x 10 mm screws, use 40 in. lbs [4.5 N·m] of torque).

Step 4 Slide the other half of the bottom-support rail onto the attached half of the rail set and use two customer supplied screws (typically M6 x 10 mm screws) to secure that portion to the vertical mounting rails on the rack. Tighten each screw to the appropriate torque setting for the screws (for M6 x 10 mm screws, use 40 in. lbs [4.5 N·m] of torque).

Figure 1: Positioning an Expanding Bottom-Support Rail Set



1	2 screws holding one end of the bottom-support bracket to the rear of the rack	3	2 screws holding the front end of the bottom-support bracket to the front side of the rack
2	Chassis stop on the expanding bottom-support bracket		

Step 5 Repeat Steps 2 and 3 to attach the other expanding bottom-support rails to the other side of the rack.

Note
Check the two installed bottom support rails to be sure that both have their chassis stops by the same aisle (either both by the hot aisle or both by the cold aisle) and that both rails are level and level with each other. If they are not level, adjust the higher rail down to the level of the lower rail.

What to do next

You are ready to install two front-mount brackets on the chassis.

Attaching Front-Mount Brackets to the Chassis

Attach a right-angled bracket to each side of the chassis. This bracket holds the chassis in place on a four-post rack.

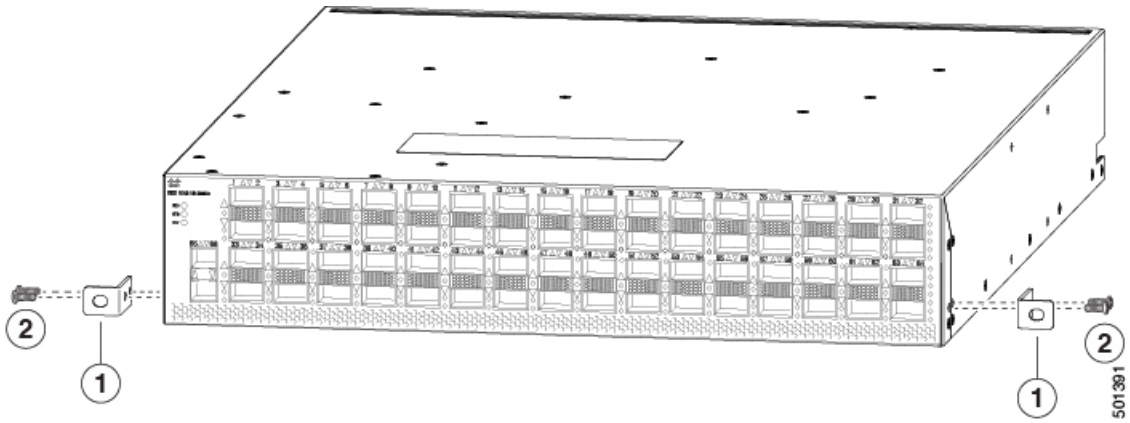
Before you begin

- You need these tools and equipment:
  - Manual Phillips-head torque screwdriver
  - Front-mount brackets (2) and screws (4). Check the switch accessory kit.

Procedure

Step 1 Align the two holes in one side of one of two front-mount brackets to two holes on the left or right side of the chassis (see the figure).

Be sure that the other side of the bracket is facing toward the front (port end) of the chassis.



1	Front-mount bracket with two screw holes aligned to two screw holes in the chassis and one screw hole facing the front (port side) of the chassis.	2	Two M4 x 6 mm screws used to fasten the bracket to the chassis.

Step 2 Use two M4 x 6 mm screws to attach the bracket to the chassis. Tighten each screw to 11 to 15 in-lb (1.2 to 1.7 Nm).

Step 3 Repeat Steps 1 and 2 to attach the second center-mount bracket to the other side of the chassis.

What to do next

You are ready to mount the chassis to the four-post rack.

Installing the Chassis in a Four-Post Rack

Slide the chassis onto the bottom-support rails so that the power supply end locks onto the chassis stops at the end of the rails and so that the front-mount brackets on the chassis come into contact with the front-mount rails on the rack.

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

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

Warning **Statement 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.

Before you begin

- Make sure that the four-post rack is properly installed and secured to the concrete subfloor.
- Make sure that the bottom-support rails are installed so that the fan modules will be in the appropriate aisle as follows:
  - Burgundy (port-side intake airflow) fan modules are positioned in a hot aisle (the chassis stop on the bottom-support rails is positioned by the hot aisle).
  - Blue colored (port-side exhaust airflow) fan modules are positioned in a cold aisle (the chassis stop on the bottom-support rails is positioned by the cold aisle).
- Make sure that two front-mount brackets are securely fastened to the sides of the chassis at the port end.
- Make sure that you have two customer-supplied rack-mount screws (M6 x 10 mm or appropriate screw for the vertical mounting rails on the rack).

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

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

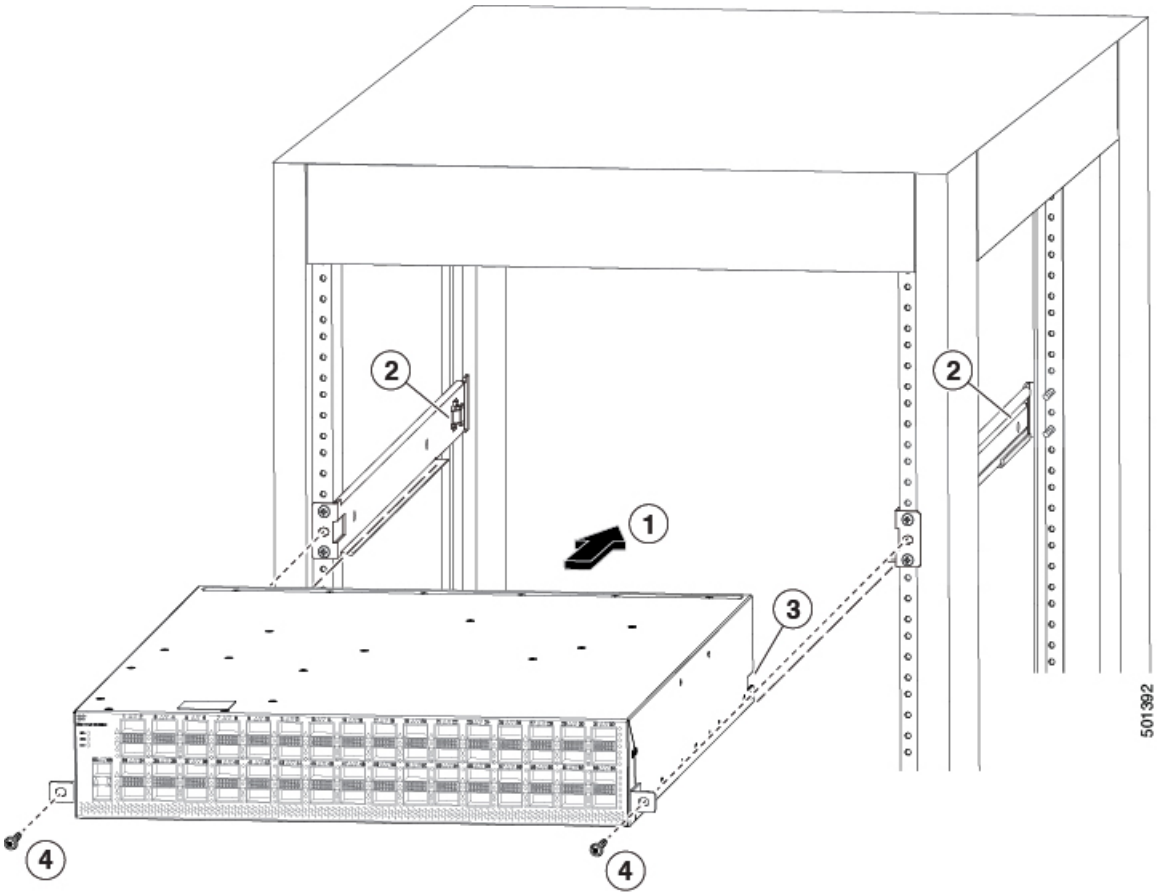
- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install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

Procedure

Step 1 Slide the power supply end of the chassis onto the bottom-support rails that are installed on the rack.

Be sure that the sides of the chassis by the power supplies clip into the chassis stops on the bottom-support rails and the front-mount brackets come in contact with the rack. See the figure.

Note
If the bottom-support rails are extended a long distance, they can bend outwards slightly when you install the chassis and the chassis stops at the far end of the rails might not fit into the end of the chassis. If this happens, press the side rails toward the sides of the chassis so that the chassis stops can go inside the chassis and hold it in place on the rack.



1	Slide the power-supply end of the chassis onto the bottom-support rails so that the chassis locks onto the chassis stops at the end of the rails.	3	Receiving hole on each side of the chassis for the chassis stops on the bottom-support rails.
2	Chassis stops for holding the chassis (positioned by the aisle required for the fan and power supply modules).	4	Customer-supplied rack-mount screw (M6 x 10 mm screw or other screw appropriate for the rack) used to secure each side of the chassis to the rack.

Step 2 Use a customer-supplied rack-mount screw (an M6 x 10 mm screw or other appropriate screw for the rack) to attach each of the two mounting brackets on the chassis to the rack and tighten each screw to the appropriate torque setting for the screw (for M6 x 10 mm screws, use 40 in-lbs [4.5 N·m] of torque).

Installing the Airflow Vent NXA-ACC-BAV3

The airflow vent bracket (NXA-ACC-BAV3) is required for NEBS (Network Equipment-Building System) compliance.

Note An electrical conducting path shall exist between the product chassis and the metal surface of the enclosure or rack in which it is mounted or to a grounding conductor. Electrical continuity shall be provided by using thread-forming type mounting screws that remove any paint or non-conductive coatings and establish a metal-to-metal contact. Any paint or other non-conductive coatings shall be removed on the surfaces between the mounting hardware and the enclosure or rack. The surfaces shall be cleaned and an antioxidant applied before installation.

Note You supply the 10-32 or 12-24 screws to mount the vent bracket and airflow sleeve.

Before you begin

- Verify that your shipment is complete.
- Install your rack in a secure location.

SUMMARY STEPS

1. Insert the vent bracket and attach it as follows:

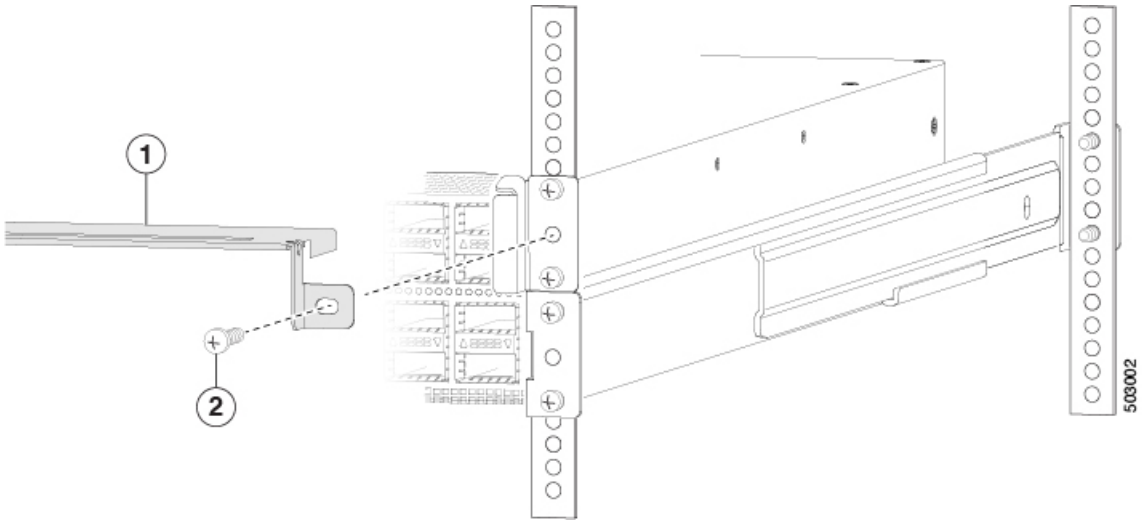
DETAILED STEPS

Procedure

Insert the vent bracket and attach it as follows:

a) Holding the vent bracket (NXA-ACC-BAV3), position it in front and above the switch (see item 1 in the following figure).

b) Holding the vent bracket level, insert screws (12-24 or 10-32, depending on the rack type) in each of the front rack-mount flanges (using a total of two screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails (see item 2 in the following figure).



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).

Grounding the Chassis

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.

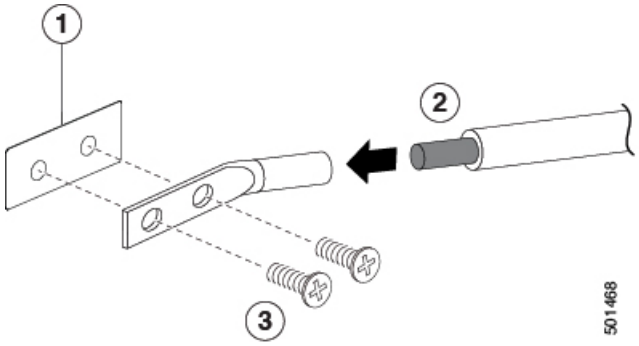
Before you begin

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

Procedure

Step 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.

Step 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).



1	Chassis grounding pad	3	2 M4 screws are used to secure the grounding lug to the chassis
2	Grounding cable, with 0.75 in. (19 mm) of insulation that is stripped from one end, which is inserted into the grounding lug and crimped in place		

Step 3 Secure the grounding lug to the chassis grounding pad with two M4 screws, see figure 1. Tighten the screws to 11 to 15 in-lb (1.24 to 1.69 N m) of torque.

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

Start the switch

Start the switch by connecting it to its dedicated power source. If you need *n*+*n*redundancy, connect each power supply in a switch to a different power source.

Note This equipment is designed to boot up in less than 30 minutes, dependent on its neighboring devices being fully up and running.

Before you begin

- The switch must be installed and secured to a rack or cabinet.
- The switch must be adequately grounded.
- The rack must be close enough to the dedicated power source so that you can connect the switch to the power source by using the designated power cables.
- You have the designated power cables for the power supplies that you are connecting to the dedicated power sources.

Note Depending on the outlet receptacle on your AC power distribution unit, you might need an optional jumper power cord to connect the switch to your outlet receptacle.

- The switch is not connected to the network (this includes any management or interface connections).
- The fan and power supply modules are fully secured in their chassis slots.

Procedure

Step 1 For any AC power supply, do the following:

a) Using the recommended AC power cable for your country or region, connect one end to the AC power supply.
b) Connect the other end of the power cable to the AC power source.

Step 2 For any DC power supply, do the following:

a) Turn off the circuit breaker for the power source to avoid an electrical shock hazard.
b) Verify that the power cable wires from the power source are connected to a connector block.
c) Insert the connector block into the receptacle on the power supply. Make sure that the connector block clicks when fully inserted in the receptacle and does not pull out.
d) If there is a safety cover for the terminals, place and secure it over the terminals to avoid an electrical shock hazard.
e) Turn on the power at the circuit breaker for the DC power source.

Step 3 Verify that the power supply LED is on and green.

Step 4 Listen for the fans; they should begin operating when the power supply is powered.

Step 5 After the switch boots, verify that these LEDs are lit:

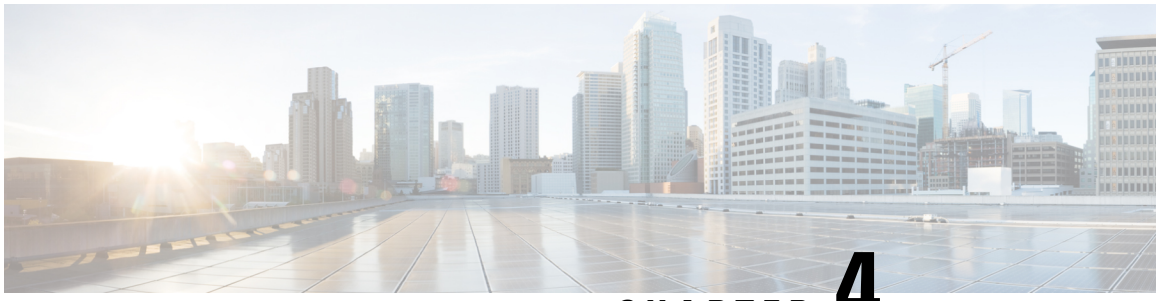
- On the fan modules, the Status (STA or STS) LED is green.

  If a fan module Status LED is not green, try reinstalling the fan module.

- After initialization, the switch chassis Status (labeled as STA or STS) LED is green.

Step 6 Verify that the system software has booted and the switch has initialized without error messages.

A setup utility automatically launches the first time that you access the switch and guides you through the basic configuration. For instructions on how to configure the switch and check module connectivity, see the appropriate Cisco N9000 Series Configuration Guides.



CHAPTER 4

Connecting the Switch to the Network

- Overview of Network Connections, on page 43
- Creating the Initial Switch Configuration, on page 43
- Setting Up the Management Interface, on page 45
- Connecting Interface Ports to Other Devices, on page 45
- Maintaining Transceivers and Optical Cables, on page 46

Overview of Network Connections

After you install the switch in a rack and power it up, make these network connections:

- Console connection—This is a direct local management connection that you use to initially configure the switch. Make this connection **first** to initially configure the switch and determine its IP address, which is needed for the other connections.
- Management connection—After you complete the initial configuration using a console, make this connection to manage all future switch configurations.
- Uplink and downlink interface connections—These are connections to hosts and servers in the network.

Each of these connection types is explained in one of these sections.

Note When running cables in overhead or subfloor cable trays, we strongly recommend that you locate power cables and other potential noise sources as far away as practical from network cabling that terminates on Cisco equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 feet (1 meter), we recommend that you shield any potential noise sources by housing them in a grounded metallic conduit.

Creating the Initial Switch Configuration

Before you begin

- A console device must be connected with the switch.
- The switch must be connected to a power source.

- Determine the IP address and the netmask that is needed for the Management (Mgmt0) interface.

Procedure

Step 1 Power up the switch by connecting each installed power supply to an AC circuit.

If you are using the input-source (*n*+*n*) power mode, connect half of the power supplies to one AC circuit. Connect the other half of the power supplies to another AC circuit.

The Input and Output LEDs on each power supply light up (green) when the power supply units are sending power to the switch. The software asks you to specify a password to use with the switch.

Step 2 Enter a new password for this switch.

The software checks the security strength of your password. It rejects your password if it does not meet these guidelines:

- At least eight characters.
- Minimizes or avoids the use of consecutive characters (such as "abcd").
- Minimizes or avoids repeating characters (such as "aaabbb").
- Does not contain recognizable words from the dictionary.
- Does not contain proper names.
- Contains both uppercase and lowercase characters.
- Contains numbers and letters.

Examples of strong passwords are:

- If2CoM18
- 2004AsdfLkj30
- Cb1955S21

Note
Clear text passwords cannot include the dollar sign ($) special character.

Tip
If a password is trivial (such as a short, easy-to-decipher password), the software will reject your password configuration. Configure a strong password as explained in this step. Passwords are case-sensitive.

When you enter a strong password, the software asks you to confirm the password.

Step 3 Enter the same password again.

If you enter the same password, the software accepts the password and begins asking a series of configuration questions.

Step 4 Until you are asked for an IP address, enter the default configuration for each question.

Repeat this step for each question until you are asked for the Mgmt0 IPv4 address.

Step 5 Enter the IP address for the management interface.

The software asks for the Mgmt0 IPv4 netmask.

Step 6 Enter a network mask for the management interface.

The software asks if you need to edit the configuration.

Step 7 Enter **no**, to not edit the configuration.

The software asks if you need to save the configuration.

Step 8 Enter **yes** to save the configuration.

What to do next

Set up the management interface for each supervisor module on the switch.

Setting Up the Management Interface

The RJ-45 and/or SFP management ports provide out-of-band management, which enables you to use the command-line interface (CLI) to manage the switch by its IP address. Use one of these ports depending on the cable and connectors that you are using to connect the management interface to the network.

Before you begin

- The switch must be powered on.
- The switch must be initially configured using a console.

Procedure

Step 1 Connect the management cable into the management port on the switch. For shorter connections, use a cable with RJ-45 connectors. For longer connections, use an optical cable with SFP transceivers (LH or SX type).

Step 2 **Note**
Use only one of these management ports—the switch does not support the use of both management ports.

Step 3 Connect the other end of the cable to a 10/100/1000 or SFP port on a network device.

Connecting Interface Ports to Other Devices

After you perform the initial configuration for the switch and create a management connection, you are ready to connect the interface ports on the switch to other devices. Depending on the types of interface ports on the switch, use interface cables with QSFP28, QSFP+, SFP+, SFP transceivers, or RJ-45 connectors to connect the switch to other devices.

Note When using SFP+ or SFP transceivers in a QSFP+ or QSFP28 uplink port, install a QSFP-to-SFP adapter, such as the CVR-QSFP-SFP10G adapter, in the QSFP port and then install the SFP+ or SFP transceiver. The switch automatically sets the port speed to the speed of the installed transceiver.

If the transceivers that you are using can be separated from their optical cables, install the transceivers without their cables before inserting the cables into the transceivers. This helps to prolong the life of both the transceiver and cables. When removing transceivers from the switch, remove the optical cable first and then remove the transceiver.

To determine which transceivers, adapters, and cables are supported by this switch, see the Cisco Transceiver Modules Compatibility Information document.

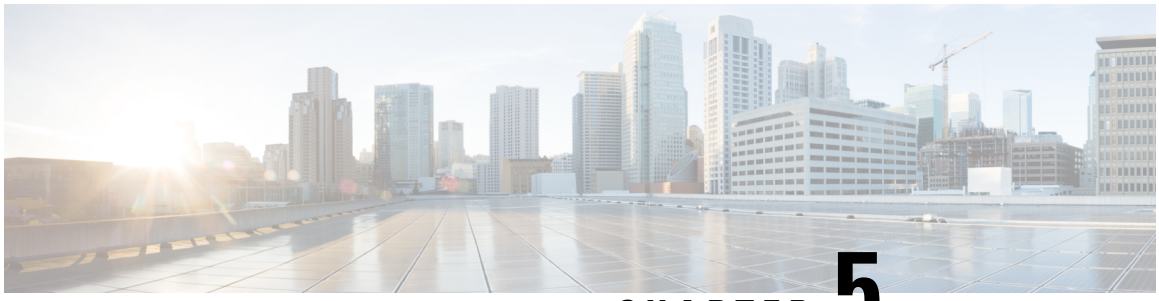
Maintaining Transceivers and Optical Cables

Keep transceivers and fiber-optic cables clean and dust free to maintain high signal accuracy and prevent damage to the connectors. Contamination increases attenuation (loss of light) and should be below 0.35 dB.

Consider these maintenance guidelines:

- Transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventative wrist strap that is connected to the grounded chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. Clean them before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch the ends of connectors. Touching the ends can leave fingerprints and cause other contamination.
- Clean the connectors regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to the fiber-optic connection cleaning procedures for your site.
- Inspect routinely for dust and damage. If you suspect damage, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

Note When you need to remove a fiber-optic transceiver, first remove the fiber-optic cable from the transceiver **before** you remove the transceiver from the port.



CHAPTER 5

Replacing Components

- Replacing a Fan Module During Operations, on page 47
- Replacing a Power Supply Module, on page 49

Replacing a Fan Module During Operations

Before you begin

Before you can replace a fan module, ensure that these conditions exist:

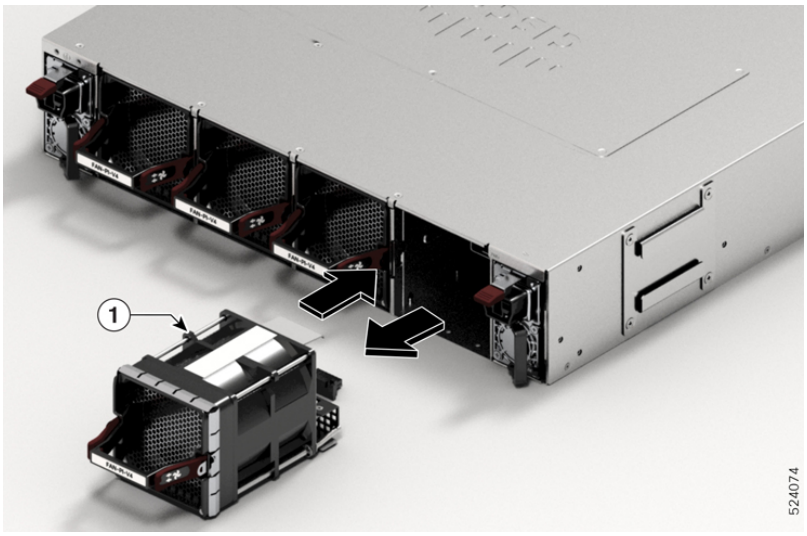
- The replacement fan module must have the same airflow direction as the other modules in the chassis.

If you must replace the fan module during operations and the above conditions are not met, leave the fan module that you need to replace in the chassis to preserve the designed airflow until you have the required module.

Procedure

Step 1 Remove the fan module that you need to replace.

a) Press two latches on the fan module and grasp the handle of fan module.



b) Place the removed module on an antistatic surface or in an antistatic bag. If possible, repack the module in its packing materials for safe shipping or storage.
c) As you press the latches, pull the fan module fully out of the chassis.
d) Place the removed module on an antistatic surface or in an antistatic bag. If possible, repack the module in its packing materials for safe shipping or storage.

1	Latched Fan Module

Step 2 Use these steps to replace the missing fan module within two minutes to avoid a shutdown.

a) Remove the replacement fan module from its packing materials and place it on an antistatic surface.

Hold the module by its handle and do not touch the electrical connectors on its backside. Also, to protect the electrical connectors, avoid letting them come in contact with anything other than the electrical connectors inside the chassis.

b) Position the fan module in front of the open fan slot (be sure that the backside of the module with the electrical connectors is positioned to enter the slot first) and slide the module all the way into the chassis until its front side comes in contact with the chassis. For the last 0.2 inches (0.5 cm), carefully mount the module onto the chassis connectors by pushing more firmly, but do not force the module if it does not move further (excessive force can damage the connectors).

Note
If you are not able to push the module all the way into the slot, carefully slide the module out of the slot and check its electrical connectors for damage. If damaged, contact Cisco Technical Assistance for help. If undamaged, repeat this step to reinstall the module.

c) Verify that the STS LED turns on and becomes green.

If the STS LED does not turn on, slide the module out of the chassis, and visually check the electrical connectors on the back side of the chassis for damage. If damaged, contact Cisco Technical Assistance for help. If undamaged, repeat the previous step to reinstall the module.

Replacing a Power Supply Module

The switch requires two power supplies for redundancy. With one power supply providing the necessary power for operations, replace the other power supply during operations as long as the new power supply has the same airflow direction as the other modules in the chassis.

Replace a power supply with another supported power supply that has the same power source type as the other installed power supply. Additionally, the airflow direction of the power supply must match or conform to the airflow direction of the installed fan modules. For the airflow direction used by the switch, see the coloring of the fan modules.

Removing an AC Power Supply

To remove an AC power supply, disconnect the power cable and remove the module from the chassis.

Before you begin

- To replace a power supply during operations, there must be a functioning power supply providing power to the switch while you replace the other power supply. If there is only one power supply installed in the switch and you need to replace it, install the new power supply in the open slot and power it up before removing the original power supply.
- Ensure that the chassis is grounded. For grounding instructions, see Grounding the Chassis, on page 38.

Procedure

Step 1 Disconnect the power cord from the power receptacle on the power supply to be removed. Verify that the LED turns off.

Note
The LED might be on and amber colored. This indicates that the input power has been disconnected.

Step 2 Remove the power supply from the chassis by pushing and holding its thumb latch to the left and pulling the power supply part way out of the chassis.

Step 3 Place your other hand under the power supply to support it while you slide it out of the chassis.

Either place the power supply on an antistatic surface or pack it in its packing materials.

What to do next

Install the replacement power supply.

Removing an HVAC/HVDC Power Supply

You can remove one power supply while the other one provides power to the switch.

To disconnect the power supply from its power cables, shut off the power from the power source and disconnect the connector for the power cables.

Procedure

Step 1 Remove the power cable from the power supply by pressing the tab of the Anderson Power SAF-D-Grid connector and pull the cable and connector out of the power supply.

Verify that the LEDs turn off on the power supply that you are removing.

Step 2 Grasp the power supply handle while pressing the release latch towards the power supply handle.

Step 3 Place your other hand under the power supply to support it while you slide it out of the chassis.

Caution
Do not touch the electrical connectors on the back side of the module. Prevent anything else from coming into contact with or damaging the connectors.

What to do next

Install an HVAC/HVDC power supply in the open slot.

Removing a DC Power Supply

You can remove one power supply while the other one provides power to the switch.

To disconnect the power supply from its power cables, shut off the power from the power source and disconnect the connector for the power cables.

Procedure

Step 1 Turn off the circuit breaker for the power feed to the power supply that you are replacing.

Verify that the LEDs turn off on the power supply that you are removing.

Step 2 Remove the power cable from the power supply by pressing the latch on the Cisco-supplied power cord to allow removal from the power supply.

Step 3 Grasp the power supply handle while pressing the release latch towards the power supply handle.

Step 4 Pull the power supply out of the bay.

What to do next

Install a DC power supply in the open slot.

Installing an AC Power Supply

You can replace one power supply while the other one provides power to the switch.

Before you begin

- The power supply that you are installing must be capable of using the same airflow direction as the fan trays installed in the same switch. It must use the same type of power source as the other power supply installed in the same switch. (Do not mix AC and DC power supplies in the same switch.)

Note If the power supply that you are replacing has a different color handle than the replacement power supply, verify that it has or will have the same airflow direction as the other modules in the switch.

- An AC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using *n*+*n* power redundancy, there must be a separate power source for each power supply installed in the chassis. Otherwise, only one power source is required.
- There must be an earth-ground connection to the chassis that you are installing the replacement module. Typically, the chassis is grounded by its metal-to-metal connection with a grounded rack. If you need to ground the chassis, see Grounding the Chassis, on page 38.

Procedure

Step 1 Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the side. Align the back end of the power supply (the end with the electrical connections) to the open power supply slot. Carefully slide the power supply all the way into the slot until it clicks into place.

Note
If the power supply does not fit into the open slot, turn the module over, before sliding it carefully into the open slot.

Step 2 Test the installation by trying to pull the power supply out of the slot without using the release latch.

If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks into place.

Step 3 Attach the power cable to the electrical inlet on the front of the power supply.

Step 4 Verify that the other end of the power cable is attached to the appropriate power source for the power supply.

Step 5 Verify that the power supply is operational by making sure that the power supply LED is green.

Installing an HVAC/HVDC Power Supply

You can replace one power supply while the other one provides power to the switch.

Note If the power supply that you are replacing has a different color handle than the replacement power supply, verify that it has or will have the same airflow direction as the other modules in the switch.

Before you begin

- If you are using *n*+*n* power redundancy, there must be a separate power source for each power supply installed in the chassis. Power sources must be of the same type—do not mix AC and DC power sources for the same switch. Otherwise, only one power source is required.
- There must be an earth-ground connection to the chassis that you are installing the replacement module. Typically, the chassis is grounded by its metal-to-metal connection to a grounded rack. If you need to ground this chassis by another means, see Grounding the Chassis, on page 38.

Procedure

Step 1 Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the side. Align the back end of the power supply (the end with the electrical connections) to the open power supply slot. Carefully slide the power supply all the way into the slot until it clicks into place.

Note
If the power supply does not fit into the open slot, turn the module over. Slide it into the open slot.

Step 2 Test the installation by trying to pull the power supply out of the slot without using the release latch.

If the power supply does not move out of place, it is secured in the slot. If the power supply moves, carefully press it all the way into the slot until it clicks into place.

Step 3 Insert the power supply cord Anderson SAF-D-Grid connector into the power supply inlet. Ensure the connector is locked. Gently tug on the cord near the connector to ensure the locking tab is engaged.

Step 4 Verify that the other end of the power cable is connected to the appropriate power source for the power supply.

Step 5 If using an HVDC power source, turn on the circuit breaker for the DC power source connected to the power supply.

Step 6 Verify that the power supply is operational by making sure that the power supply LED is green.

Installing a DC Power Supply

You can replace one power supply while the other one provides power to the switch.

Before you begin

- The circuit breaker for the DC power source for the power supply must be turned off.
- The power supply that you are installing must be capable of using the same airflow direction as the fan trays installed in the same switch.
- A DC power source must be within reach of the power cable that will be used with the replacement power supply. If you are using *n*+*n* power redundancy, there must be a separate power source for each power supply installed in the chassis. Otherwise, only one power source is required.
- There must be an earth-ground connection to the chassis that you are installing the replacement module. Typically, the chassis is grounded by its metal-to-metal connection to a grounded rack. If you need to ground this chassis by another means, see Grounding the Chassis, on page 38.

- All DC power supplies have reverse polarity protection. When you inadvertently connect the input power (+) to the DC PSU's – terminal and the input power – to the DC PSU's (+) terminal, the PSU will not be damaged and will operate fine after the input power feeds are correctly wired.

Procedure

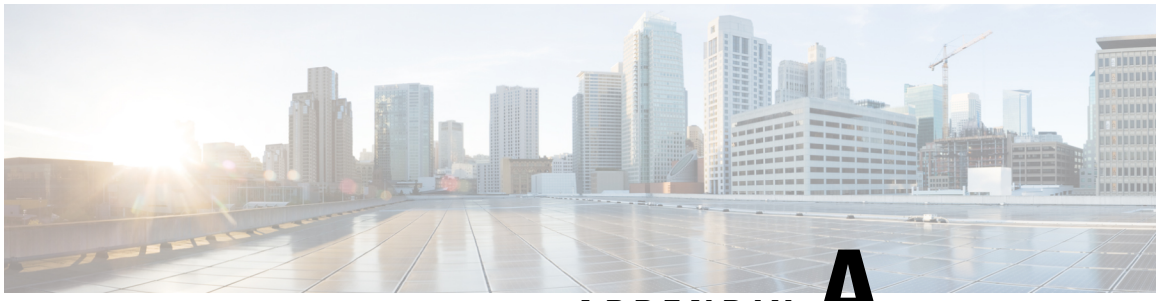
Step 1 Holding the replacement power supply with one hand underneath the module and the other hand holding the handle, turn the power supply so that its release latch is on the side. Align the back end of the power supply (the end with the electrical connections) to the open power supply slot. Carefully slide the power supply all the way into the slot until it clicks into place.

Note
If the power supply does not fit into the open slot, turn the module over. Carefully slide it into the open slot.

Step 2 Verify the rack is properly grounded, so that when the chassis is installed in the rack, it will be grounded.

Step 3 Turn on the circuit breaker for the DC power source connected to the power supply.

Step 4 Verify that the power supply is operational by making sure that the power supply LED is green.



APPENDIX A

Rack Specifications

- Overview of Racks, on page 55
- General Requirements for Cabinets and Racks, on page 55
- Requirements Specific to Standard Open Racks, on page 56
- Requirements Specific to Perforated Cabinets, on page 56
- Cable Management Guidelines, on page 56

Overview of Racks

Install the switch in these types of cabinets and racks, assuming an external ambient air temperature range of 0 to 104°F (0 to 40°C):

- Standard perforated cabinets
- Solid-walled cabinets with a roof fan tray (bottom to top cooling)
- Standard open racks

Note

- If you are using an enclosed cabinet, we recommend one of the thermally validated types, either standard perforated or solid-walled with a fan tray.
- We do not recommend using racks that have obstructions (such as power strips). The obstructions could impair access to field-replaceable units (FRUs).

General Requirements for Cabinets and Racks

The cabinet or rack must meet these requirements:

- Standard 19-inch (48.3 cm) (two- or four-post EIA cabinet or rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992). For more information, see Requirements Specific to Perforated Cabinets, on page 56.

  The spacing between the posts of the rack must be (EIA-310-D-1992 19-inch rack compatible) wide enough to accommodate the width of the chassis.

- The minimum vertical rack space requirement per chassis is:
  - For a one RU (rack unit) switch, 1.75 inches (4.4 cm)
  - For a one and a half RU (rack unit) switch, 2.63 (6.68 cm)
  - For a two RU (rack unit) switch, 3.5 inches (8.8 cm)
  - For a three RU (rack unit) switch, 5.25 inches (13.3 cm)
- The width between the rack-mounting rails must be at least 17.75 inches (45.0 cm) if the rear of the device is not attached to the rack. For four-post EIA racks, this measurement is the distance between the two front rails.

Four-post EIA cabinets (perforated or solid-walled) must meet these requirements:

- The minimum spacing for the bend radius for fiber-optic cables should have the front-mounting rails of the cabinet offset from the front door by a minimum of 3 inches (7.6 cm).
- The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.0 to 30.0 inches (58.4 to 76.2 cm) to allow for rear-bracket installation.

Requirements Specific to Standard Open Racks

If you are mounting the chassis in an open rack (no side panels or doors), ensure that the rack meets these requirements:

- The minimum vertical rack space per chassis must be equal to the rack unit (RU) of the chassis. One rack unit is equal to 1.75 inches (4.4 cm).
- The distance between the chassis air vents and any walls should be 2.5 inches (6.4 cm).

Requirements Specific to Perforated Cabinets

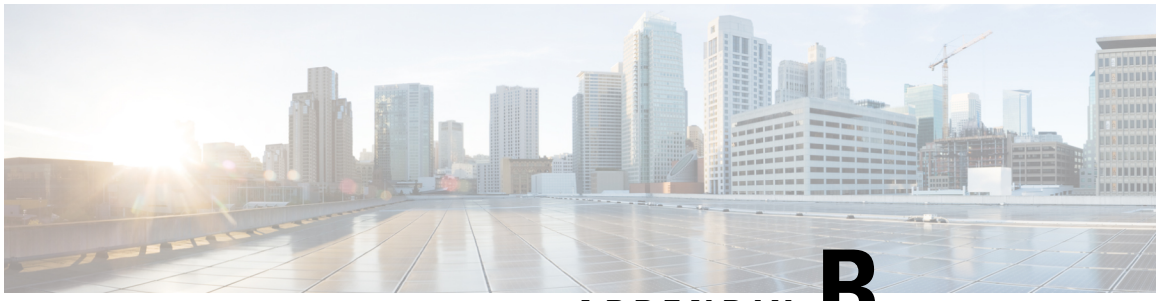
A perforated cabinet has perforations in its front and rear doors and side walls. Perforated cabinets must meet these requirements:

- The front and rear doors must have at least a 60 percent open area perforation pattern, with at least 15 square inches (96.8 square cm) of open area per rack unit of door height.
- The roof should be perforated with at least a 20 percent open area.
- The cabinet floor should be open or perforated to enhance cooling.

The Cisco R Series rack conforms to these requirements.

Cable Management Guidelines

To help with cable management, allow additional space in the rack above and below the chassis to make it easier to route all of the fiber optic or copper cables through the rack.



APPENDIX B

System Specifications

- Environmental Specifications, on page 57
- Switch Dimensions, on page 57
- Switch and Module Weights and Quantities, on page 58
- Transceiver and Cable Specifications, on page 58
- Switch Power Input Requirements, on page 58
- Power Specifications, on page 59
- Power Cable Specifications, on page 60
- Regulatory Standards Compliance Specifications, on page 62

Environmental Specifications

Environment		Specification
Temperature	Ambient operating temperature	32 to 104°F (0 to 40°C)
	Ambient nonoperating	–40 to 158°F (–40 to 70°C)
Relative humidity	Operating	5 to 90%
	Nonoperating	5 to 95%
Altitude	Operating	0 to 13,123 feet (0 to 4,000 meters)

Switch Dimensions

Switch	Width	Depth	Height
Cisco N93216TC-FX2	17.4 inches (44.2 cm)	23.6 inches (59.9 cm)	3.38 inches (8.59 cm) (2 RU)

Switch and Module Weights and Quantities

Component	Weight per Unit	Quantity
Cisco N93216TC-FX2 Chassis (N9K-C93216TC-FX2)	27.4 lb (12.4 kg)	1
Fan Module – Port-side exhaust (blue) (NXA-FAN-160CFM-PE) – Port-side intake (burgundy) (NXA-FAN-160CFM-PI)	— 1.3 lb (0.59 kg) 1.3 lb (0.59 kg)	3
Power Supply module – 1200-W AC port-side exhaust (blue) (NXA-PAC-1200W-PE) – 1200-W AC port-side intake (burgundy) (NXA-PAC-1200W-PI) – 1200-W HVAC/HVDC dual-direction (white) (N9K-PUV-1200W) – 930-W DC port-side exhaust (blue) (NXA-PDC-930W-PE) – 930-W DC port-side intake (burgundy) (NXA-PDC-930W-PI)	— 2.64 lb (1.2 kg)	2 (1 for operations and 1 for redundancy)

Transceiver and Cable Specifications

To see the transceiver specifications and installation information, see https://www.cisco.com/c/en/us/support/interfaces-modules/transceiver-modules/products-device-support-tables-list.html.

Switch Power Input Requirements

This table lists the typical amount of power that the switch consumes. It also lists the maximum amount of power that you must provision for the switch and power supply for peak conditions.

Note Some power supplies have capabilities that are greater than the maximum power requirements for a switch. To determine the power consumption characteristics for the switch, use the typical and maximum requirements that are listed here.

Note If you want to use optics that consume **5W or more power on all the 36 ports**, you must install 1100W power supplies.

Switch	Typical Power Consumption (AC or DC)	Maximum Power Consumption (AC or DC)	Heat Dissipation Requirement
Cisco N93216TC-FX2	580 W	965 W	3292.717 BTUs per hour

Power Specifications

Power specifications include the specifications for each type of power supply module.

1200-W AC Power Supply Specifications

These specifications apply to the following 1200-W AC power supplies:

Characteristic	Specification
AC input voltage	Nominal range: 100-120 VAC, 200-240 VAC
AC input frequency	Nominal range: 50 to 60 Hz (Range: 47-63 Hz)
Maximum AC input current	10 A at 100-120 VAC 8 A at 200-240 VAC
Maximum output power per power supply	800 W at 100-120 VAC 1200 W at 200-240 VAC
Maximum hold-up time	12 ms at 650 W
Power supply output voltage	12 VDC
Power supply standby voltage	12 VDC
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum certified)
Form factor	RSP1

1200-W HVAC/HVDC Power Supply Specifications

These specifications apply to the N9K-PUV-1200W power supplies.

Characteristic	Specification
Input voltage • AC (for 1230 W output) • DC (for 1230 W output)	• Nominal range: 100-240 Vac (Range: 90-264 Vac) • Nominal range: 200-277 Vac (Range: 180-305 Vac) • Nominal range: 240-380 Vdc (Range: 1204-400 Vdc)
AC input frequency	Nominal: 50 to 60 Hz (Range: 47-63 Hz)

Characteristic	Specification
Maximum AC input current	10 A at 100 Vac
Maximum inrush current	35 A (cold turn on); 70 A (hot turn on)
Maximum output Watts • For 200 to 277 VAC • For 192 to 400 VDC	Per power supply • 1230 W • 1230 W
Power supply output voltage • For 200 to 277 VAC • For 192 to 400 VDC	Per power supply • 12 Vdc at 100 A • 12 Vdc at 100 A
Power supply standby voltage	12 V at 2.5 A
Efficiency rating	Climate Savers Platinum Efficiency (80Plus Platinum certified)
Form factor	RSP1

930-W DC Power Supply Specifications

These specifications apply to the NXA-PDC-930W power supplies.

Characteristic	Specification
DC input voltage range	Nominal range: -48 to -72 Vdc nominal (Range: -40 to -60 Vdc
Maximum DC input current	23 A at -48 Vdc
Maximum output power per power supply	930 W
Maximum inrush current	35 A (sub-cycle duration)
Maximum hold-up time	8 ms at 930 W
Power supply output voltage	12 Vdc
Power supply standby voltage	12 Vdc
Efficiency rating	Greater than 92% at 50% load
Form factor	RSP1

Power Cable Specifications

These sections show the power cables that you can order and use with this switch.

Power Cable Specifications for AC Power Supplies

Power Type	Power Cord Part Number	Cord Set Description
	CAB-C13-C14-2M	Power Cord Jumper, C13-C14 Connectors, 6.6 feet (2.0 m)
	CAB-C13-CBN	Cabinet jumper power cord, 250 VAC, 10 A, C14-C13 connectors, 2.3 feet (0.7 m)
Argentina	CAB-250V-10A-AR	250 V, 10 A, 8.2 feet (2.5 m)
Australia	CAB-9K10A-AU	250 VAC, 10 A, 3112 plug, 8.2 feet (2.5 m)
Brazil	CAB-250V-10A-BR	250 V, 10 A, 6.9 feet (2.1 m)
European Union	CAB-9K10A-EU	250 VAC, 10 A, CEE 7/7 plug, 8.2 feet (2.5 m)
India	CAB-IND-10A	10 A, 8.2 feet (2.5 m)
India	CAB-C13-C14-2M-IN	Power Cord Jumper, C13-C14 Connectors, 6.6 feet (2.0 m)
India	CAB-C13-C14-3M-IN	Power Cord Jumper, C13-C14 Connectors, 9.8 feet (3.0 m)
Israel	CAB-250V-10A-IS	250 V, 10 A, 8.2 feet (2.5 m)
Italy	CAB-9K10A-IT	250 VAC, 10 A, CEI 23-16/VII plug, 8.2 feet (2.5 m)
Japan	CAB-C13-C14-2M-JP	Power Cord Jumper, C13-C14 Connectors, 6.6 feet (2.0 m)
North America	CAB-9K12A-NA	125 VAC, 13 A, NEMA 5-15 plug, 8.2 feet (2.5 m)
North America	CAB-AC-L620-C13	NEMA L6-20-C13, 6.6 feet (2.0 m)
North America	CAB-N5K6A-NA	200/240V, 6A, 8.2 feet (2.5 m)
Peoples Republic of China	CAB-250V-10A-CN	250 V, 10 A, 8.2 feet (2.5 m)
South Africa	CAB-250V-10A-ID	250 V, 10 A, 8.2 feet (2.5 m)
Switzerland	CAB-9K10A-SW	250 VAC, 10 A, MP232 plug, 8.2 feet (2.5 m)
United Kingdom	CAB-9K10A-UK	250 VAC, 10 A, BS1363 plug (13 A fuse), 8.2 (2.5 m)
All except Argentina, Brazil, and Japan	NO-POWER-CORD	No power cord included with switch

HVAC/HVDC Power Cables Supported by ACI-Mode and NX-OS Mode Switches

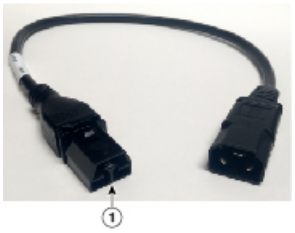
Part Number	Cord Set Description	Photo
CAB-HVAC-SD-0.6M	HVAC 2-foot (0.6 m) cable with Saf-D-Grid and SD connectors 277V AC	
CAB-HVAC-C14-2M	HVAC 6.6-foot (2.0 m) cable with Saf-D-Grid and C14 (use for up to 240 V) connector 250V AC	
CAB-HVAC-RT-0.6M	HVAC 2-foot (0.6 m) cable with Saf-D-Grid and RT connector 277V AC	
CAB-HVDC-3T-2M	HVDC 6.6-foot (2.0 m) cable with Saf-D-Grid and three terminal connectors 300V AC / 400V DC (+200/-200 V DC)	
NO-POWER-CORD	All except Argentina, Brazil, and Japan No power cord included with switch	Not applicable

Table 2: HVAC/HVDC Power Cables Callout Table

1	Connect this end to the power supply unit.

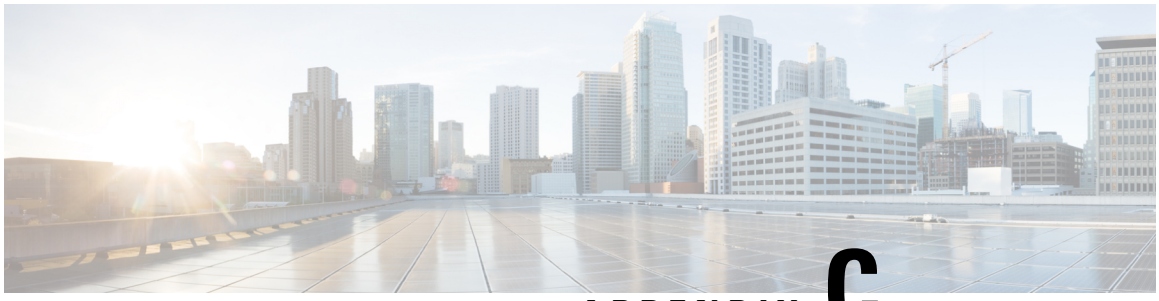
Regulatory Standards Compliance Specifications

This table lists the regulatory standards compliance for the switch.

Table 3: Regulatory Standards Compliance: Safety and EMC

Specification	Description
Regulatory compliance	Products should comply with CE Markings according to directives 2004/108/EC and 2006/95/EC.
Safety	• CAN/CSA-C22.2 No. 60950-1 Second Edition • CAN/CSA-C22.2 No. 62368-1-19 Third Edition • ANSI/UL 60950-1 Second edition • IEC 62368-1 • EN 62368-1 • AS/NZS 62368-1 • GB4943 • UL 62368-1
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR22 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN 61000-4 series
RoHS	The product is RoH-6 compliant with exceptions for leaded-ball grid-array (BGA) balls and lead press-fit connectors.

System Specifications



APPENDIX C

LEDs

- Switch Chassis LEDs, on page 65
- Fan Module LEDs, on page 66
- Power Supply LEDs, on page 66

Switch Chassis LEDs

The BCN, STS, and ENV, LEDs are located on the left side of the front of the switch. The port LEDs appear as triangles pointing up or down to the nearest port.

LED	Color	Status
BCN	Flashing blue	The operator has activated this LED to identify this switch in the chassis.
	Off	This switch is not being identified.
STS	Green	The switch is operational.
	Flashing amber	The switch is booting up.
	Amber	Temperature exceeds the minor alarm threshold.
	Red	Temperature exceeds the major alarm threshold.
	Off	The switch is not receiving power.
ENV	Green	Fans and power supply modules are operational.
	Amber	At least one fan or power supply module is not operating.
(port)	Green	Port admin state is 'Enabled', SFP is present and the interface is connected (that is, cabled, and the link is up).
	Amber	Port admin state is 'Disabled, or the SFP is absent, or both.
	Off	Port admin state is 'Enabled' and SFP is present, but interface is not connected.

LED	Color	Status
(GPS)	Green	GPS interface provisioned and ports are turned on. ToD, 1PPS, 10MHz are all valid.
	Off	Either the interface is not provisioned, or the ports are not turned on. ToD, 1PPS, 10MHz are not valid.

Fan Module LEDs

LED	Color	Status
Status	Green	The fan module is operational.
	Red	The fan module is not operational (fan is probably not functional).
	Off	Fan module is not receiving power.

Power Supply LEDs

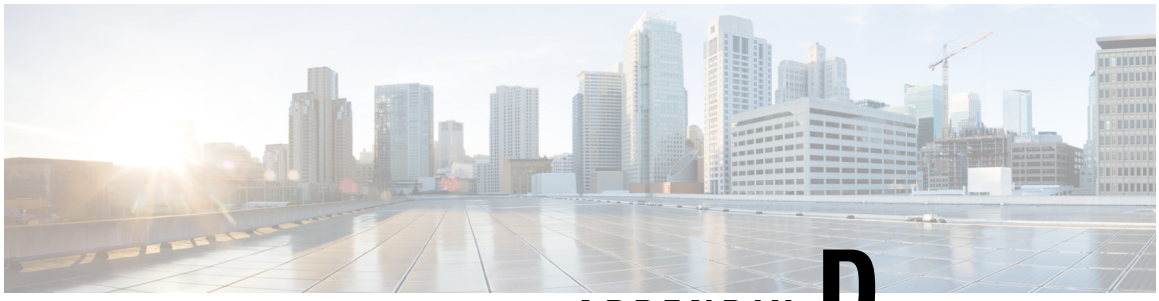
The power supply LEDs are located on the right portion of the power supply.

Table 4: Power Supply LEDs

LEDs	Status
Off	The power supply is not functioning due to lack of input or output power. The input voltage is below the acceptable operating range. There is no 12 V standby from a parallel power supply unit.
Solid Amber	Failure (no output) or one of these possible conditions: • AC input below operating range, but 12V standby power is being supplied from a parallel power supply unit, • Over voltage, • Over current, • Over temperature, or • OTP due to fan failure.
Blinking Amber (1 Hz)	Power supply is operating but a warning condition has occurred—possibly one of these conditions: • High temperature, • High power, or • Slow fan.

LEDs	Status
Blinking Green (2 Hz)	Input is present and its voltage is within the operating range. The power supply is in standby mode due to PSON_L=High.
Blinking Green (1 Hz)	The power supply is Bootloading (startup mode). **Note** This applies only to NXA-PDC-2KW-PI and NXA-PDC-2KW-PE power supplies.
Solid Green	The power supply provides a regulated 12 V main output and a 12 V standby output.

LEDs



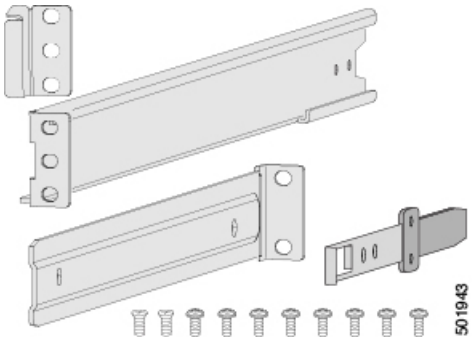
APPENDIX D

Additional Kits

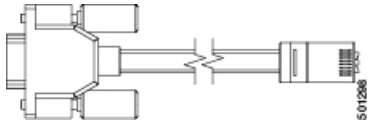
- Rack Mount Kit NXK-ACC-RMK-2RU, on page 69
- Rack Mount Kit N9K-C9300-RMK, on page 70
- Vent Bracket, on page 70

Rack Mount Kit NXK-ACC-RMK-2RU

The following table lists and illustrates the contents for the 2-RU rack-mount kit (NXK-ACC-RMK-2RU).

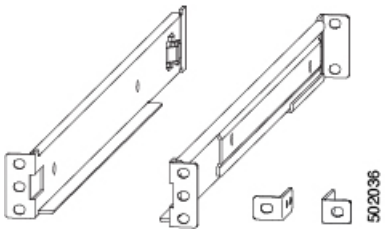
Illustration	Description	Quantity
	Rack-mount kit • Rack-mount brackets (2) • Rack-mount retainer brackets (2) • Rack-mount slider rails (2) • Rack-mount retainer clips (2) • Phillips countersink screws (8) • Flat head screws (4)	1
Not applicable	EAC Compliance document	1
Not applicable	Hazardous substances list for customers in China	1

The following table lists and illustrates the console cable (CAB-CONSOLE-RJ45) that can be ordered.

Illustration	Description	Quantity
	Console cable with DB-9F and RJ-45F connectors	1

Rack Mount Kit N9K-C9300-RMK

The following table lists and illustrates the contents for the 2-RU rack-mount kit (N9K-C9300-RMK).

Illustration	Description	Quantity
	Rack-mount kit • Bottom support rails (2) • Front-mount brackets (2)	1

Vent Bracket

The following table lists and illustrates the vent bracket (NXA-ACC-BAV3).

Note You require the vent bracket (NXA-ACC-BAV3) for NEBS (Network Equipment-Building System) compliance only.

Illustration	Description	Quantity
	Vent bracket	1