

Installing the Switch 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

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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.

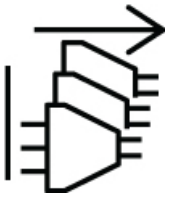
Warning **Statement 1091**—Installation by an Instructed Person or Skilled Person

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-KIT-1RU) 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.
- Rack-mount kit (N3K-C3064-ACC-KIT) which you can order from Cisco.

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

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

Airflow Considerations

The switch comes with fan and power supply modules that have either port-side intake or port-side exhaust airflow for cooling the switch. If you are positioning the port end of the switch in a cold aisle, verify that the switch has port-side intake fan modules with burgundy coloring. If you are positioning the fan and power supply modules in a cold aisle, verify that the switch has port-side exhaust fan modules with blue colorings. All fan modules must have the same direction of airflow.

Installation Guidelines

When installing the switch, follow these guidelines:

- Ensure that there is adequate clearance space around the switch to allow for servicing the switch and for adequate airflow.
- Ensure that 1RU clearance space is available above the ORV3 rack to hot swap the field replaceable units.
- Ensure that the chassis can be adequately grounded. If the switch is not mounted in a grounded rack, we recommend connecting the system ground on the chassis directly to an earth ground.

- Ensure that the site power meets the power requirements for the switch. If available, use an uninterruptible power supply (UPS) to protect against power failures.

Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with the switch, which can have substantial current draw fluctuations because of fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. Typically, this often requires one or both of these:
  - AC power supplies typically require at least a 15-A or 20-A AC circuit, 100 to 240 VAC, and a frequency of 50 to 60 Hz.

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.

Unpacking and Inspecting the Switch

Before you install the switch, unpack and inspect the switch for damage or missing components. If anything is missing or damaged, contact your customer service representative immediately.

Tip Keep the shipping container in case the chassis requires shipping at a later time.

Before you begin

Before you unpack the switch and before you handle any switch components, be sure that you are wearing a grounded electrostatic discharge (ESD) strap. To ground the strap, attach it directly to an earth ground or to a grounded rack or grounded chassis (there must be a metal-to-metal connection to the earth ground).

Procedure

Step 1 Compare the shipment to the equipment list provided by your customer service representative and verify that you have received all items, including:

- Accessory Kit

Step 2 Check for damage and report any discrepancies or damage to your customer service representative. Have this information ready:

- Invoice number of shipper (see packing slip)

- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Installing the Switch Using the NXK-ACC-KIT-1RU Rack-Mount Kit

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



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

Before you begin

- Inspected the switch shipment to ensure that you have everything ordered.
- Verify that the switch rack-mount kit includes these parts:
  - Front rack-mount brackets (2)
  - Rear rack-mount brackets (2)
  - Slider rails (2)
  - M4 x 0.7 x 8-mm Phillips countersink screws (10-12)
- The rack is installed and secured to its location.

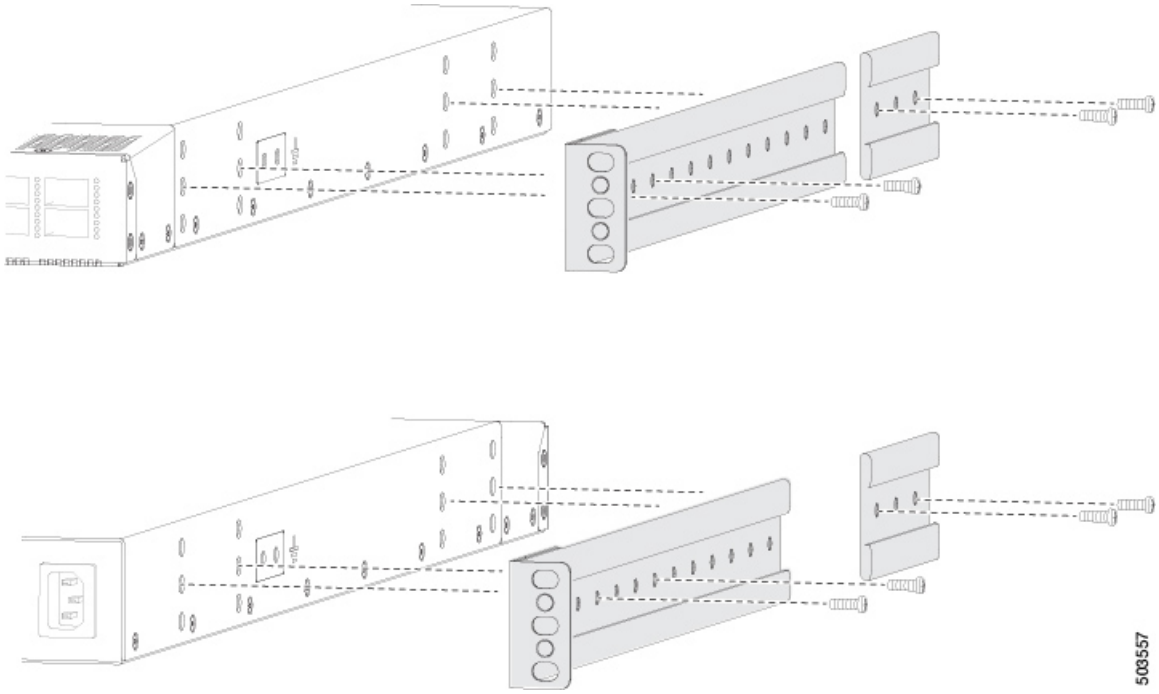
Procedure

Step 1 Install two front rack-mount brackets and the two rear rack-mount brackets to the switch.

a) Determine which end of the chassis is to be located in the cold aisle.
   - If the switch has port-side intake modules (fan modules with burgundy coloring), position the switch so that its ports will be in the cold aisle.
   - If the switch has port-side exhaust modules (fan modules with blue coloring), position the switch so that its fan and power supply modules will be in the cold aisle.

b) Position the front rack-mount bracket and the rear rack-mount bracket so that its screw holes are aligned to the screw holes on the side of the chassis.

Note
Align the holes in the rack-mount bracket to the holes on the side of the chassis (see the two ways to mount these brackets on a typical chassis, in the figure). The holes that you use depend on the requirements of your rack and the amount of clearance required for interface cables (3 inches [7.6 mm] minimum) and module handles (1 inch [2.5 mm] minimum).



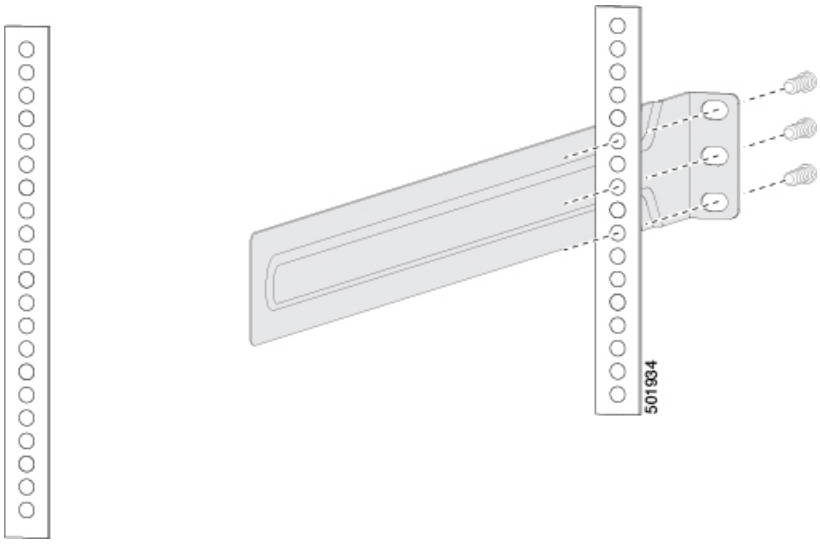
c) Secure the front-mount bracket and the back-mount bracket to the chassis using four M4 screws. Tighten each screw to 12 in-lb (1.36 N·m) of torque.
d) Repeat Step 1 for the other front rack-mount bracket and the other back-mount bracket on the other side of the switch. Be sure to position that bracket the same distance from the front of the switch.

Note
Depending on the chassis depth, the back rack-mount bracket may not fit. In that case, you do not need the back rack-mount bracket.

Step 2 If you are not installing the chassis into a grounded rack, attach a customer-supplied grounding wire to the chassis as explained in the Grounding the Chassis, on page 15 section. If you are installing the chassis into a grounded rack, skip this step.

Step 3 Install the slider rails on the rack or cabinet.

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. 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. Use 12-24 screws or 10-32 screws, depending on the rack thread type. To attach the rails to the rack, see the figure. Tighten 12-24 screws to 30 in-lb (3.39 N·m) of torque. Tighten 10-32 screws to 20 in-lb (2.26 N m) of torque.

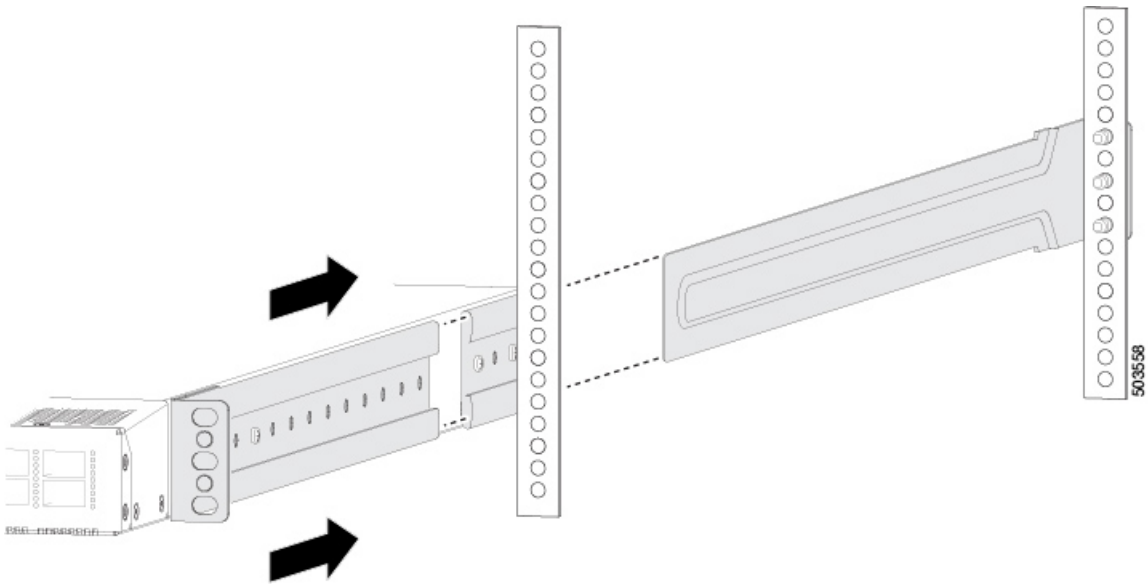


c) Repeat Step 3 to attach the other slider rail to the other side of the rack.

Make sure that the slider rails are at the same level. Use a level tool, tape measure, or carefully count the screw holes in the vertical mounting rails.

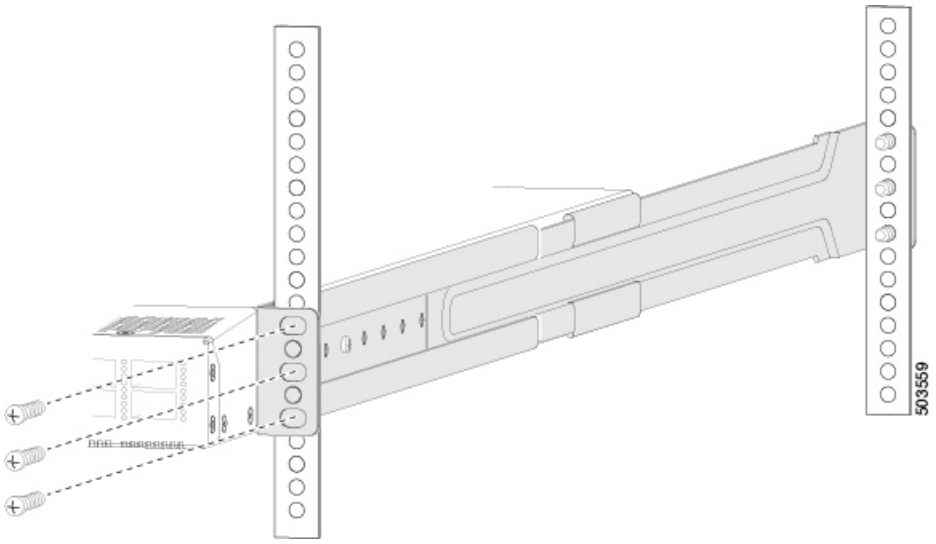
Step 4 Insert the switch into the rack and attach it.

a) Holding the switch with both hands, position the two, rear rack-mount brackets on the switch between the rack or cabinet posts that do not have slider rails attached to them (see the figure).



b) Align the two rear rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails. Gently slide the switch all the way into the rack until the front rack-mount brackets come in contact with two rack or cabinet posts.

c) Holding the chassis level, insert screws (12-24 or 10-32, depending on the rack type) in each of the two front rack-mount brackets (using a total of six screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails (see the figure).



d) 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 5 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 into a Two-Post Rack Using the NXK-ACC-KIT-1RU Rack-Mount Kit

To install the switch, you attach the front mounting brackets to the switch and secure the switch to the front of the rack. Typically, the front of the rack is the side easiest to access for maintenance.

Note This is not the preferred rack installation method. This method may not be earthquake safe and will not be NEBS compliant.

Note You supply six 10-32 or 12-24 screws required to mount the rails 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 these parts:
  - Front rack-mount brackets (2)
  - Rear rack-mount brackets (2) (not needed for this procedure)
  - Slider rails (2) (not needed for this procedure)

- M4 x 0.7 x 8-mm Phillips countersink screws (12)

- The rack is installed and secured to its location.

SUMMARY STEPS

1. Install two front rack-mount brackets to the switch.
2. If you are not installing the chassis into a grounded rack, attach a customer-supplied grounding wire to the chassis as explained in the Grounding the Chassis, on page 15 section. If you are installing the chassis into a grounded rack, skip this step.
3. Insert the switch into the rack and attach it.
4. If you attached a grounding wire to the chassis grounding pad, connect the other end of the wire to the facility ground.

DETAILED STEPS

Procedure

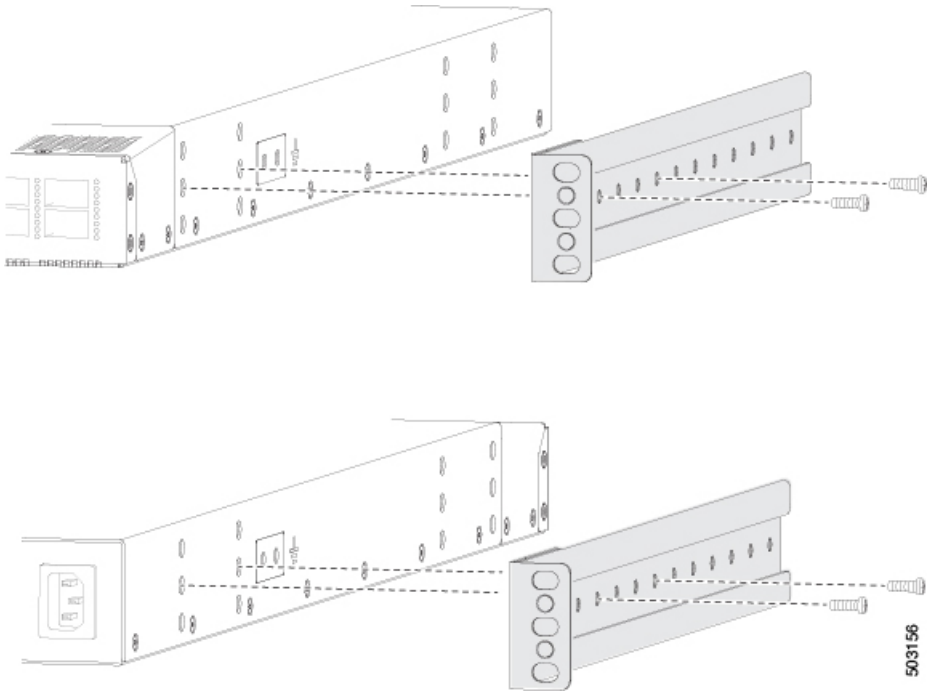
Step 1 Install two front rack-mount brackets to the switch.

a) Determine which end of the chassis goes in the cold aisle.

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

b) Position the front rack-mount bracket and the rear rack-mount bracket so that its screw holes are aligned to the screw holes on the side of the chassis.

Note
Align the holes in the rack-mount bracket to the holes on the side of the chassis (see the two ways to mount these brackets on a typical chassis, in the figure). The holes that you use depend on the requirements of your rack and the amount of clearance required for interface cables (3 inches [7.6 mm] minimum) and module handles (1 inch [2.5 mm] minimum).



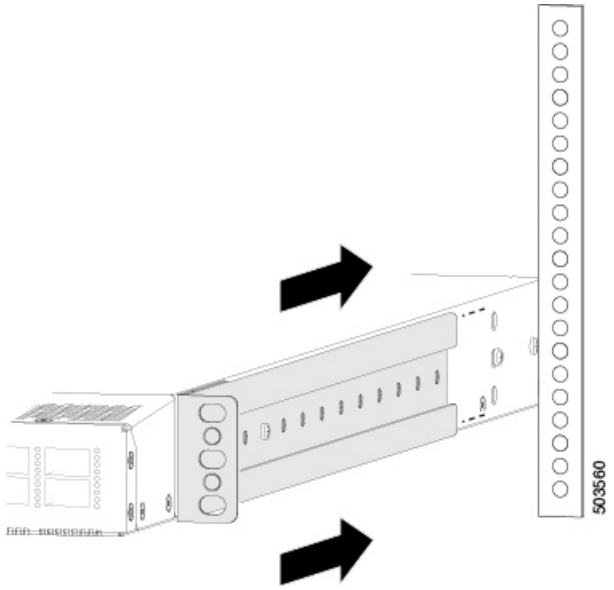
c) Secure the front-mount bracket to the chassis using four M4 screws and tighten each screw to 12 in-lb (1.36 N·m) of torque.

d) Repeat Step 1 for the other front rack-mount bracket on the other side of the switch and be sure to position that bracket the same distance from the front of the switch.

Step 2 If you are not installing the chassis into a grounded rack, attach a customer-supplied grounding wire to the chassis as explained in the Grounding the Chassis, on page 15 section. If you are installing the chassis into a grounded rack, skip this step.

Step 3 Insert the switch into the rack and attach it.

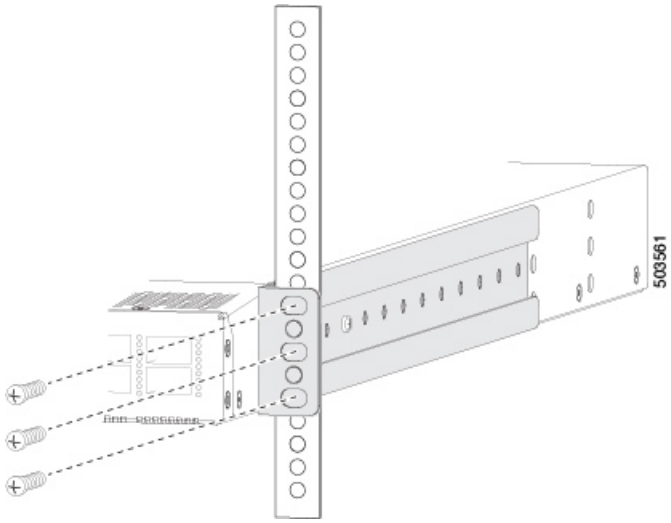
a) Holding the switch with both hands, position the brackets on the switch between the cabinet posts (see the figure).



b) Gently slide the switch all the way into the rack until the front rack-mount brackets come in contact with the cabinet posts.

Note
If you attached a grounding cable to the chassis, bend one of the rack-mounts slightly to allow the grounding lug to go behind the rail.

c) Holding the chassis level, insert screws (12-24 or 10-32, depending on the rack type) in each of the two front rack-mount brackets (using a total of six screws) and into the cage nuts or threaded holes in the vertical rack-mounting rails (see the figure).



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

Installing the Airflow Sleeve (N9K-AIRFLOW-SLV)

Install the airflow sleeve (N9K-AIRFLOW-SLV) to allow proper airflow, so that the switch is properly cooled. This airflow sleeve is only compatible with rack mount kit (N3K-C3064-ACC-KIT).

Table 1: Airflow Sleeve (N9K-AIRFLOW-SLV) Minimum and Maximum Rack Rail Depth.

Chassis	Minimum Rack Rail Depth	Maximum Rack Rail Depth
N9K-C92348GC-X	636.49 mm	748.25 mm
N9K-C9316D-GX	824.80 mm	916.60 mm
N9K-C9332C	794.20 mm	898.70 mm
N9K-C9332D-GX2B	824.00 mm	915.80 mm
N9K-C9332D-GX2B-M	824.00 mm	915.80 mm
N9K-C9336C-FX2	802.39 mm	903.98 mm

Chassis	Minimum Rack Rail Depth	Maximum Rack Rail Depth
N9K-C9336C-FX2-E	806.90 mm	898.70 mm
N9K-C9348GC-FXP	672.49 mm	764.29 mm
N9K-C93108TC-FX	781.29 mm	873.09 mm
N9K-C93108TC-FX3P	672.49 mm	769.69 mm
N9K-C93180YC-FX	781.29 mm	873.09 mm
N9K-C93180YC-FX3	672.49 mm	784.25 mm
N9K-C93180YC-FX3S	672.49 mm	784.25 mm
N9K-C93400LD-H1	663 mm	775 mm
N9K-C93600CD-GX	824.80 mm	916.60 mm

Note You supply the screws to mount the airflow sleeve.

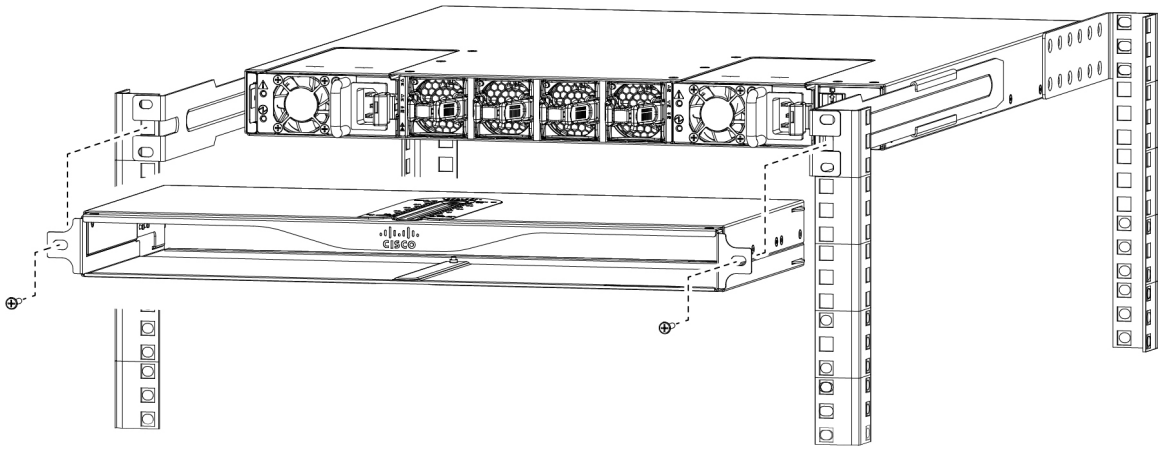
Before you begin

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

Procedure

Insert the airflow sleeve into the rack and attach it.

a) Holding the airflow sleeve (N9K-AIRFLOW-SLV) with both hands, position it in front of the fan side of the chassis.
b) Holding the airflow sleeve level, insert screws (12-24 or 10-32, depending on the rack type) in each of the two 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 the 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) of torque.

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 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 1024—**Ground Conductor

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

Warning **Statement 1046—**Installing or Replacing the Unit

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

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

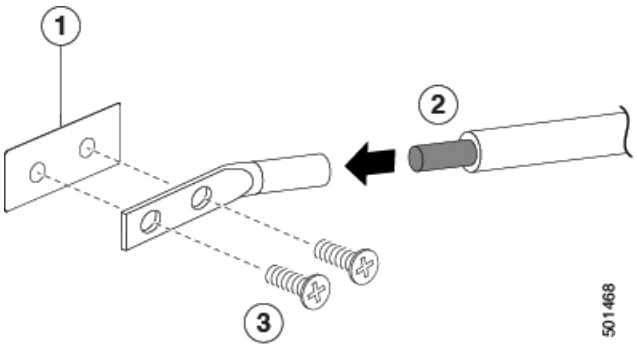
Before you begin

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

Procedure

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.

Starting 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 (Optional) For any AC power supply, do this:

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 (Optional) For any HVAC/HVDC power supply, connect it to a power source like this:

a) Using the recommended high voltage power cable for your country or region, connect the Anderson Power Saf-D-Grid connector on the power cable to the power receptacle on the power supply. Make sure that the connector clicks when fully pushed into the receptacle.

b) Connect the other end of the power cable to a power source.

- When connecting to an HVAC power source, insert the plug in a receptacle for the HVAC power source.
- When connecting to an HVDC power source, do this:
  1. Verify that the power is turned off at a circuit breaker for the power source terminals.
  2. Remove the nuts from each of the terminal posts for the power source.
  3. Place the power cable ground-wire terminal ring on the ground terminal for the power source and secure them with a terminal nut.
  4. Place the power cable negative-wire terminal ring on the negative terminal for the power source and secure them with a terminal nut.
  5. Place the power cable positive-wire terminal ring on the positive terminal for the power source and secure them with a terminal nut.
  6. If there is a safety cover for the power source terminals, place and secure it over the terminals.
  7. Turn on the power at the power source circuit breaker.

Step 3 (Optional) For any DC power supply, do this:

a) Turn off the circuit breaker for the power source.
b) When using an LV DC power supply that does not use a lug, connect the supplied wiring harness to the source. Or connect the user-supplied wires to the LV DC power source.
c) When using an LV DC power supply that does not use a lug, connect the attached plug of the supplied wiring harness to the power supply. Or attach the lugs of the user supplied wires to the power supply.
d) If there is a safety cover for the power source terminals, place and secure it over the terminals.
e) Turn on the power at the circuit breaker for the DC power source.

Step 4 Verify that the power supply LED is on and green.

Step 5 Listen for the fans; they should begin operating when the power supply is powered.

Step 6 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 7 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.