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 Nexus 3000 and 9000 Series* for important Safety Information.

Statement 1071—Warning Definition

IMPORTANT SAFETY INSTRUCTIONS

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

SAVE THESE INSTRUCTIONS

Statement 1017—Restricted Area

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.

Statement 1030—Equipment Installation

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

Installation Options with Racks and Cabinets

You can install the switch in the following types of racks using the rack-mount kit shipped with the switch:

- Open EIA rack
- Perforated EIA cabinet

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

The rack-mount kit enables you to install the switch into racks of varying depths. You can use the rack-mount kit parts to position the switch with easy access to either the port connections end of the chassis or the end of the chassis with the fan and power supply modules. For instructions on how to install the rack-mount kit, see the Installing the Switch, on page 4.

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, make sure that the switch has port-side intake modules with burgundy colorings on the fan and AC power supplies and green markings on DC power supplies. If you are positioning the fan and power supply modules in a cold aisle, make sure that the switch has port-side exhaust modules with blue colorings.

Installation Guidelines

When installing the switch, follow these guidelines:

- Record equipment and installation information in the forms presented in Appendix E, "Site Planning and Maintenance Records" as you install and configure the switch.
- Ensure that there is adequate space around the switch to allow for servicing the switch and for adequate airflow (see
- Ensure that you are positioning the switch in a rack so that it takes in cold air from the cold aisle and exhausts air to the hot aisle. If there is blue coloring on the fan tray and AC power supply modules, the switch is configured for port-side exhaust and you must position the fan and power supply modules in a cold aisle. If there is burgundy coloring on the fan and AC power supply modules or green coloring on the DC power supply modules, the switch is configured for port-side intake and you must position the ports in a cold aisle.
- Ensure that the chassis can be adequately grounded. If the switch is not mounted in a grounded rack, we recommend connecting both the system ground on the chassis directly to an earth ground.
- Ensure that the site power meets the power requirements listed in Appendix B System Specifications. If available, you can 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 the following:
  - AC power supplies typically require at least a 15-A or 20-A AC circuit.
  - DC power supplies require the following:
    - DC input voltage range of –48 to -60 VDC nominal (self-ranging, –40 to –72 VDC)
    - DC line input current (steady state) of 23 A peak at –48 VDC

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 Installing the Switch

Before you install the switch, be sure to 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).

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

- Accessory kit, which includes the following:
  - Ground lug kit
  - ESD wrist strap
- Rack-mount kit
- Cables with connectors
- Any optional items ordered

Step 2 Check for damage and report any discrepancies or damage to your customer service representative. Have the following 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

To install the switch, you must 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 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:
  - Front rack-mount brackets (2)
  - Rear rack-mount brackets (2)
  - Slider rails (2)
  - M4 x 0.7 x 8-mm Phillips countersink screws (12)
- The rack is installed and secured to its location

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

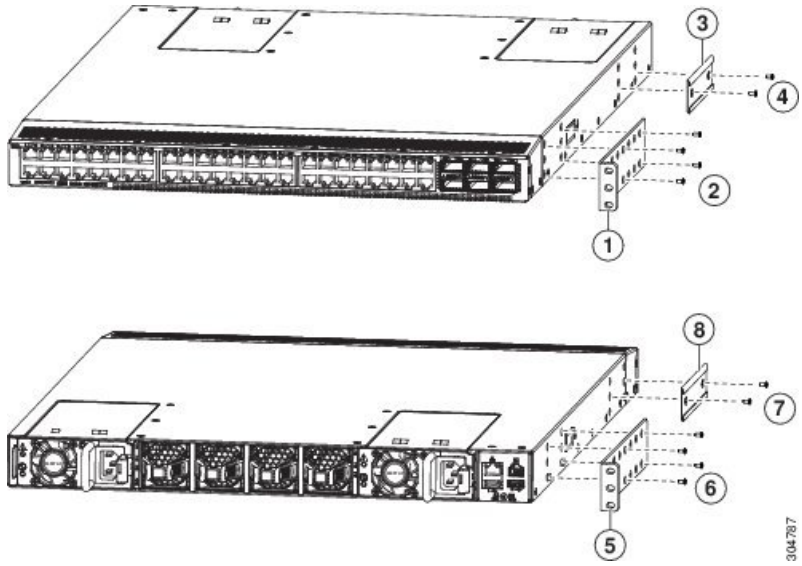
a) Determine which end of the chassis is to be located in the cold aisle as follows:

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

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

Note You can align any four of the holes in the front rack-mount bracket to four of the six screw holes on the side of the chassis (see the following 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).

Figure 1: Two Ways to Attach Rack-Mount Brackets and Guides on the Switch



1	Front rack-mount bracket aligned to the module end of the chassis	5	Front rack-mount bracket aligned to the port connections end of the chassis
2	Four M4 screws used to attach the bracket to the chassis	6	Four M4 screws used to attach the bracket to the chassis
3	Rear rack-mount guide aligned to the port connection end of the chassis	7	Rear rack-mount guide aligned to the mobile end of the chassis
4	Two M4 screws used to attach the bracket to the chassis	8	Two M4 screws used to attach the bracket to the chassis

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 Install the two rear rack-mount brackets on the chassis as follows:

a) Align the two screw holes on a rear rack-mount bracket to the middle two screw holes in the remaining six screw holes on a side of the chassis. If you are aligning the guide to holes that are near the port connections end of the chassis, see Callout 3 in the previous figure. Otherwise, see Callout 7 in the previous figure.

b) Attach the guide to the chassis using two M4 screws (see Callout 4 or 8 in the previous figure). Tighten the screws to 12 in-lb (1.36 N·m) of torque.

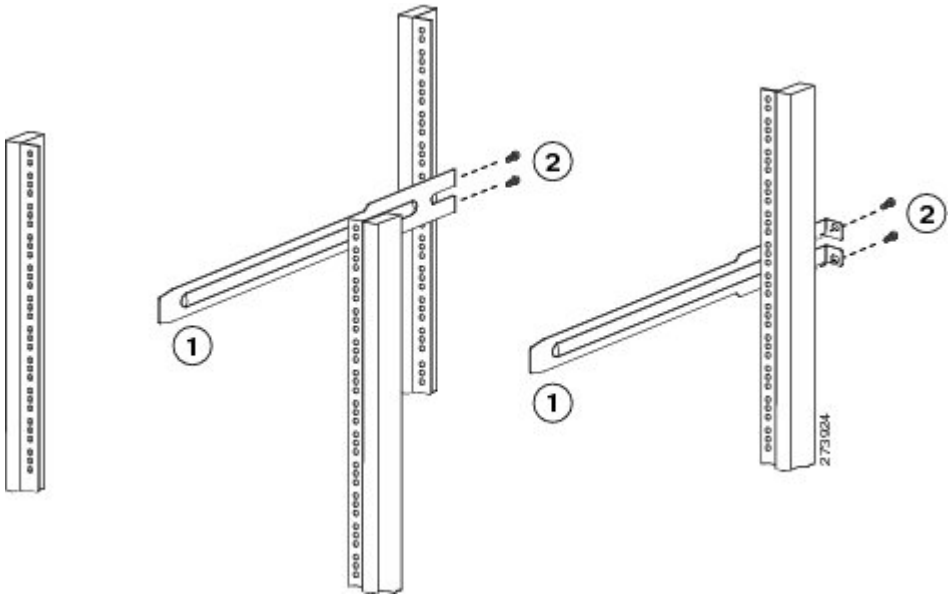
c) Repeat Step 2 for the other rear rack-mount bracket on the other side of the switch.

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 use two 12-24 screws or two 10-32 screws, depending on the rack thread type, to attach the rails to the rack (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.

Figure 2: Installing the Slider Rails



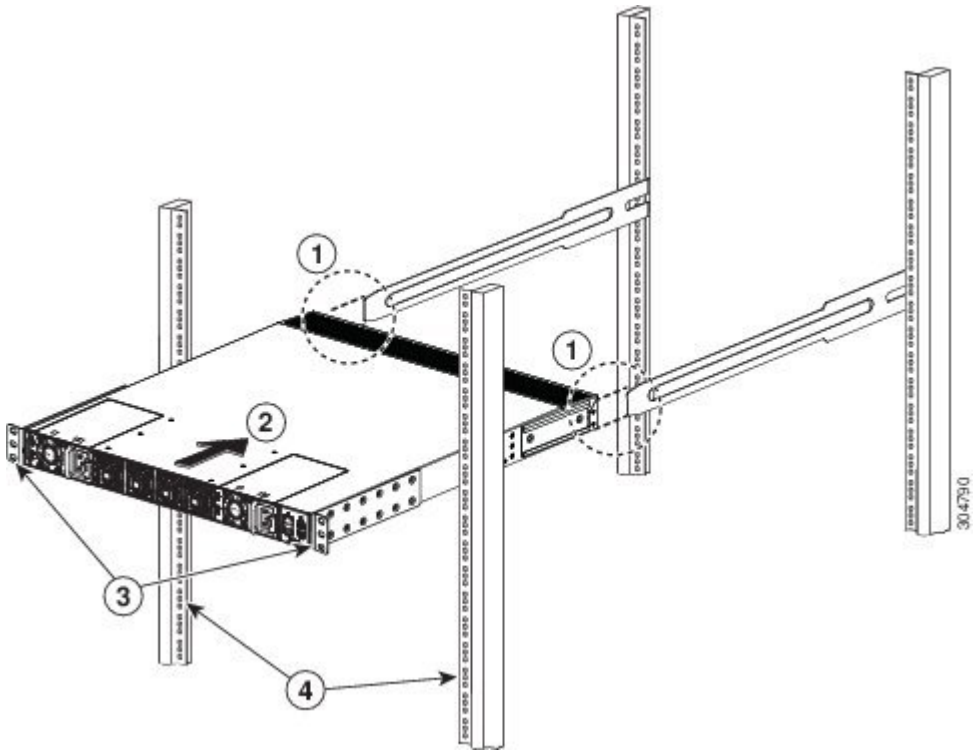
1	Slider rail with screw holes aligned to screw holes in rack	2	Two customer-supplied 12-24 or 10-32 screws used to attach each slider rail to the rack

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 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 following figure).

Figure 3: Sliding the Chassis into the Rack

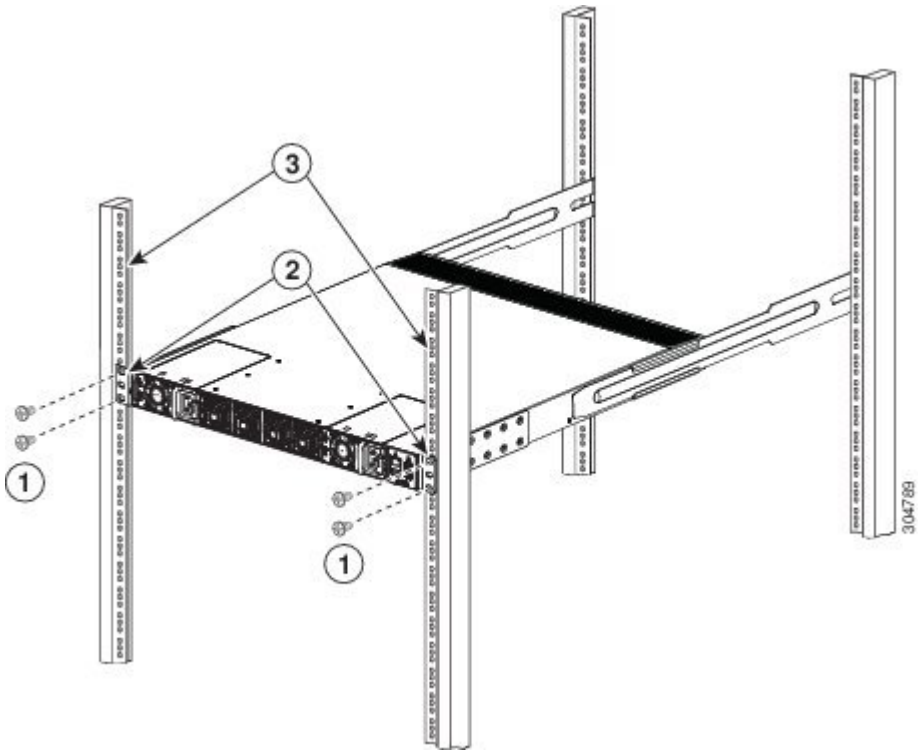


1	Align the two rear rack-mount bracket guides with the slider rails installed in the rack.	3	Front-mount brackets.
2	Slide the rack-mount guides onto the slider rails until the front rack-mount brackets come in contact with the front rack-mount rails.	4	Mounting rails on rack or cabinet posts.

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

Figure 4: Attaching the Switch to the Rack



1	Fasten the chassis to the front of the rack with two 12-24 or 10-32 screws on each side.	3	Mounting rails on rack or cabinet posts.
2	Front-mount bracket.		

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).

Grounding the Chassis

The switch is grounded when you connect the chassis and the power supplies to the earth ground in the following ways:

- You connect the chassis (at its grounding pad) to the data center ground. If the rack is fully-bonded and grounded, you can ground the switch by connecting it to the rack.

Note The chassis ground connection is active even when the power supply modules have not been grounded or connected to the switch.

- You connect each AC power supply to the earth ground automatically when you connect the power supply to an AC power source (see Powering Up the Switch).
- You connect each DC power supply to the earth ground when you connect the power cables to the connector block and insert the connector block to the power supply (see Powering Up the Switch).

Warning **Statement 1024—**Ground Conductor

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

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

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, you must have a connection to the earth ground for the data center building. If you installed the switch chassis into a bonded rack (see the rack manufacturer's instructions for more information) that now has a connection to the data center earth ground, you can ground the chassis by connecting its grounding pad to the rack. Otherwise, you must connect the chassis grounding pad directly to the data center ground.

To connect the switch chassis to the data center ground, you need the following tools and materials:

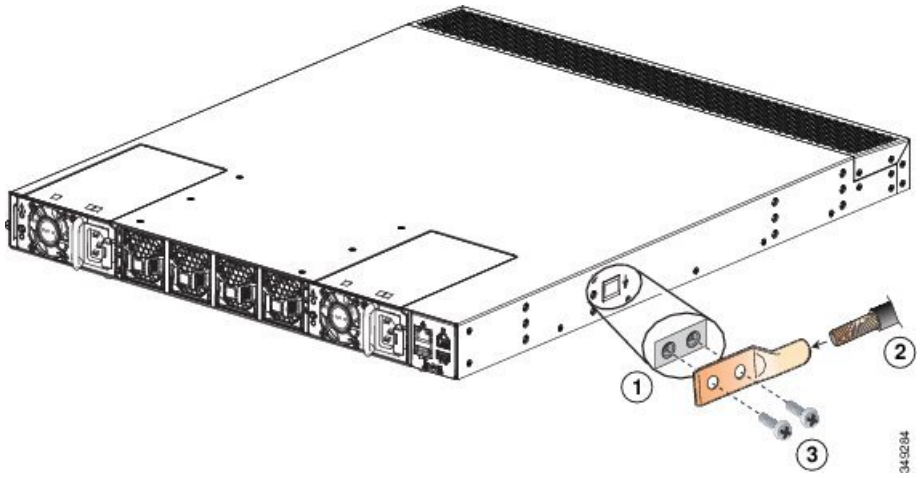
- Grounding lug—A two-holed standard barrel lug that supports up to 6 AWG wire. This lug is supplied with the accessory kit.
- Grounding screws—Two M4 x 8 mm (metric) pan-head screws. These screws are shipped with the accessory kit.
- Grounding wire—Not supplied with the accessory kit. This wire should be sized to meet local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations. We recommend that you use commercially available 6 AWG wire. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- Number 1 Phillips-head torque screwdriver.
- Crimping tool to crimp the grounding wire to the grounding lug.

- Wire-stripping tool to remove the insulation from the grounding wire.

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.

Step 2 Insert the stripped end of the grounding wire into the open end of the grounding lug, and use a crimping tool to crimp the lug to the wire (see Callout 2 in the following figure). Verify that the ground wire is securely attached to the grounding lug by attempting to pull the wire out of the crimped lug.

Figure 5: Grounding the Chassis



1	Chassis grounding pad	3	Two M4 screws used to secure the grounding lug to the chassis
2	Grounding cable, with 0.75 in. (19 mm) of insulation stripped from one end, 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 Callouts 1 and 3 in the previous figure), and tighten the screws to 12 in-lb (1.36 N·m) of torque.

Step 4 Prepare the other end of the grounding wire and connect it to an appropriate grounding point in your site to ensure an adequate earth ground for the switch. If the rack is fully bonded and grounded, connect the grounding wire as explained in the documentation provided by the vendor for the rack.

Starting the Switch

You start the switch by connecting it to its dedicated power source. If you need power-supply redundancy, you must connect each of the power supplies to one or two power sources. If you need grid redundancy, you must connect each power supply in a switch to a different power source.

Before You Begin

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

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.

  All of the fan slots must be filled with fan modules. The power supply slots must have at least one power supply. If there is an open power supply slot, it must have a blank filler plate installed to preserve the designed airflow.
- Ensure that the switch is adequately grounded (see Grounding the Chassis, on page 8).

Step 1 Connect each power supply to a power source as follows:

- For AC power supplies, do the following:

  1. Using the recommended power cable for your country or region, connect the C13 plug on the power cable to the power receptacle on the power supply.
  2. Rotate the cable retention clip on the power supply over the C13 plug to prevent accidental unplugging of the cable.
  3. Connect the other end of the power cable to the AC power source.
     - For no power redundancy, connect one power supply to one power source.
     - For power supply redundancy, connect two power supplies to one or two power sources.
     - For grid redundancy, connect each of two power supplies to a different power source.
  4. Verify that the power supply LED is on and green.

     If the LED is off, check the power source circuit breaker to be sure that it is turned on.

- For DC power supplies, do the following:

1. Turn off the DC power source from your facility's circuit breaker to avoid electric shock hazard.
2. Connect the DC power connector block, which is wired to the DC power source and the earth ground, to the DC power supply receptacle.

   If the power connector block is not wired to the power and grounding cables, see Wiring a 48 V DC Electrical Connector Block
3. Verify that the ground cable is connected to an earth ground and the other ends of the power cables are connected to the DC power source.
   - For no power redundancy, connect one power supply to one power source.
   - For power supply redundancy, connect two power supplies to one or two power sources.
   - For grid redundancy, connect each of two power supplies to a different power source.
4. Turn on the power at the circuit breaker for the DC power source.
5. Verify that the power supply LED is on and green.

   If the LED is off, check the DC power source circuit breaker to be sure that it is turned on.

Step 2 Listen for the fans; they should begin operating when the power supply is powered.

Step 3 After the switch boots, verify that the LEDs are lit as follows:

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

  If a fan module Status LED is not green, try reinstalling the fan module as described in Replacing a Fan Module.
- After initialization, the switch chassis Status (labeled as STA or STS) LED is green.
- The Link LEDs for the Ethernet connectors should not be on unless cables are connected.

Step 4 Verify that the system software has booted and the switch has initialized without error messages.

Step 5 Complete the worksheets provided in Appendix E, "Site Planning and Maintenance Records," for future reference.

Note

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 Nexus 93xxx configuration guide.