



Installing the Cisco Nexus 5600 Series Switches

This chapter describes how to install the Cisco Nexus 5600 switch. This chapter includes the following sections:

- [Preparing for Installation, page 2-2](#)
- [Installation Options with Racks and Cabinets, page 2-2](#)
- [Airflow Direction, page 2-2](#)
- [Chassis Weight, page 2-2](#)
- [Installation Guidelines, page 2-3](#)
- [Required Equipment, page 2-4](#)
- [Unpacking and Inspecting the Switch, page 2-4](#)
- [Installing a Cisco Nexus 5600 Series Switch, page 2-5](#)
- [Grounding the Switch, page 2-8](#)
- [Starting the Switch, page 2-13](#)



Note

Before you install, operate, or service the system, see the *Regulatory, Compliance, and Safety Information for the Cisco Nexus 6000 Series, Cisco Nexus 5000 Series, Cisco Nexus 3000 Series, and Cisco Nexus 2000 Series* for important safety information.



Warning

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.
Statement 1071

SAVE THESE INSTRUCTIONS



Warning

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 1017

**Warning**

Only trained and qualified personnel must be allowed to install, replace, or service this equipment.
Statement 1030

**Note**

Each new switch requires a license. For information on licensing, see the *Cisco NX-OS Licensing Guide*.

Preparing for Installation

This section describes how to prepare the Cisco Nexus 5600 switch for installation. This section includes the following topics:

- [Installation Options with Racks and Cabinets, page 2-2](#)
- [Airflow Direction, page 2-2](#)
- [Chassis Weight, page 2-2](#)
- [Installation Guidelines, page 2-3](#)
- [Required Equipment, page 2-4](#)
- [Unpacking and Inspecting the Switch, page 2-4](#)

Installation Options with Racks and Cabinets

The Cisco Nexus 5600 switch can be installed in the following types of racks using a rack-mount kit shipped with the switch:

- Open EIA rack
- Perforated EIA cabinet

To enable you to easily mount your switch in any qualifying rack, you can attach the rack-mount brackets to accommodate racks of different depths. For instructions on how to use a rack-mount kit, see the [“This chapter describes how to install the Cisco Nexus 5600 switch. This chapter includes the following sections:” section on page 2-1.](#)

Airflow Direction

The airflow through the fan trays and power supplies on the Cisco Nexus 5600 switch is either from the port side exhaust or the port side intake, depending on how the modules were ordered. To ensure proper airflow, you must make sure that when you install the switch its air intake is positioned in a cold aisle and the air exhaust is positioned in a hot aisle for your data center.

Chassis Weight

When lifting the switch chassis, follow these guidelines:

- Disconnect all power and external cables before lifting the switch.

- Have two people lift the switch. The Cisco Nexus 5672UP with two power supplies, weighs 32 lbs. The Cisco Nexus 5672UP-16G with two power supplies, weighs 33 lbs. The Cisco Nexus 56128P weighs 70 lbs. with 4 fans, 2 expansion modules and 4 power supplies. The Cisco Nexus 5696Q weighs 134 lbs. with 4 fans, 2 generic expansion modules (GEMs), and 4 power supplies. The Cisco Nexus 5624Q weighs 36 lbs. with two power supplies and 1 GEM. The Cisco Nexus 5648Q weighs 61.5 lbs. with two power supplies and 2 GEMs. Ensure that your footing is solid and the weight of the switch is evenly distributed between your feet.
- Lift the switch slowly, keeping your back straight. Lift with your legs, not with your back. Bend at the knees, not at the waist.

Installation Guidelines

When installing the Cisco Nexus 5600 switch, follow these guidelines:

- Record the information listed in [Appendix G, “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. [Appendix B, “Technical Specifications,”](#) lists the service and airflow requirements.
- Ensure that the air-conditioning meets the heat dissipation requirements listed in [Appendix B, “Technical Specifications,”](#)
- Ensure that the cabinet or rack meets the requirements listed in [Appendix A, “Cabinet and Rack Installation”](#)



Note Jumper power cords are available for use in a cabinet. See the [“Jumper Power Cord”](#) section on [page C-8](#).

- 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 and the power supply ground directly to an earth ground.
- Ensure that the site power meets the power requirements listed in [Appendix B, “Technical 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 systems such as the Cisco Nexus 5600 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. For North America, the power supply requires a 15-A or 20-A circuit.



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 Ensure that all fan trays and power supplies have the same airflow direction.

- Use the following screw torques when installing the switch:
 - Captive screws: 4 in-lb (0.45 N•m)
 - M3 screws: 4 in-lb (0.45 N•m)
 - M4 screws: 12 in-lb (1.36 N•m)
 - 10-32 screws: 20 in-lb (2.26 N•m)
 - 12-24 screws: 30 in-lb (3.39 N•m)

Required Equipment

Before beginning the installation, ensure that you have the following items available:

- Four 12-24 or 10-32 screws for attaching slider rails to the rack
- Number 1 and number 2 Phillips screwdrivers with torque capability
- 3/16-inch flat-blade screwdriver
- Tape measure and level
- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

The following additional items (not found in the accessory kit) are required to ground the chassis:

- Grounding cable (6 AWG recommended), sized according to local and national installation requirements; the required length depends on the proximity of the switch to proper grounding facilities
- Crimping tool large enough to accommodate the girth of the lug
- Wire-stripping tool

Unpacking and Inspecting the Switch



Caution

When handling switch components, wear an ESD strap and handle modules by their handles and carrier edges only. An ESD socket is provided on the chassis. For the ESD socket to be effective, the chassis must be grounded through the power cable, the chassis ground, or the metal-to-metal contact with a grounded rack.



Tip

Keep the shipping container in case the chassis requires shipping in the future.



Note

The switch is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

To inspect the shipment, follow these steps:

-
- 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:
- Grounding lug kit
 - Rack-mount kit
 - ESD wrist strap
 - 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 a Cisco Nexus 5600 Series Switch

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5600 switch into a cabinet or rack that meets the requirements described in [Appendix A, “Cabinet and Rack Installation.”](#)



Caution

If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Rack-Mount Kits

The tables below lists the items contained in the rack-mount kits provided with the Cisco Nexus 5696Q, 5672UP and 5672UP-16G, 56128P, 5624Q, and 5648Q switches.

Table 2-1 Cisco Nexus 5696Q Rack-Mount Kit

Quantity	Part Description
2	Rack-mount outer rail
2	Rack-mount inner rail
1	Rack-mount support rail, left
1	Rack-mount support rail, right
2	Rack-mount slide rail
24	M4 x 0.7x8mm Phillips flat-head screw

Table 2-2 Cisco Nexus 5672UP and 5672UP-16G switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount guides
2	Rack-mount brackets
2	Rack-mount sliders
16	M4 x 0.7 x 8mm Phillips flat-head screws

**Note**

You must supply the 24 screws required to mount the rack brackets and slider rails to the rack. The rack-mount kit does not provide these screws.

Table 2-3 Cisco Nexus 56128P switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
16	M4 x 0.7 x 8mm Phillips countersunk screws
2	Rack-mount guides
2	Rack-mount slider rails (22 inch minimum to a 36 inch maximum)

Table 2-4 Cisco Nexus 5624Q switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
16	M4 x 0.7 x 8mm Phillips flat-head screws
2	Rack-mount guides
2	Rack-mount sliders

Table 2-5 Cisco Nexus 5648Q switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
16	M4x0.7 x 8mm Phillips countersunk screws
2	Rack-mount guides
2	Rack-mount sliders

Installation

To install the switch in a rack or cabinet using the rack-mount kit provided with the switch, follow these steps:

Step 1 Install the front rack-mount brackets on the chassis as follows:

- a. Position a front rack-mount bracket on the side of the chassis with its four holes aligned to four of the six screw holes on the front side of the chassis, and then use four M4 screws to attach the bracket to the chassis.



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

- b. Repeat Step 1a with the other front rack-mount bracket on the other side of the switch.

Step 2 Install the rear rack-mount guides on the chassis as follows:

- a. Position a rear rack-mount bracket on the side of the chassis with its four holes aligned to four of the six screw holes on the side of the chassis, and then use four M4 screws to attach the bracket to the chassis.
- b. Repeat Step 2a with the other rear rack-mount bracket on the other side of the switch.

Step 3 Install the slider rails to the rack as follows:

- a. Position the slider rails 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.



Note For racks with square holes, you might need to position a 12-24 cage nut behind each mounting hole in a slider rail before using a 12-24 screw.

- b. Repeat with the other slider rail on the other side of the rack.
- c. Use the tape measure and level to verify that the rails are at the same height and horizontal.

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

- a. Holding the switch with both hands, position the back of the switch between the front posts of the rack.
- 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.



Note If the switch does not slide easily, try realigning the rack-mount guides on the slider rails.

- c. Holding the chassis level, insert two screws (12-24 or 10-32, depending on the rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail.
- d. Repeat for the other front rack-mount bracket on the other side of the switch.

Grounding the Switch

This section describes the need for system grounding for all of the Cisco Nexus 5600 switch and explains how to prevent damage from electrostatic discharge.

This section includes the following topics:

- [Proper Grounding Practices, page 2-8](#)
- [Preventing Electrostatic Discharge Damage, page 2-9](#)
- [Establishing the System Ground, page 2-11](#)
- [Required Tools and Equipment, page 2-11](#)
- [Grounding the Cisco Nexus 5600 Series Chassis, page 2-12](#)

Proper Grounding Practices

Grounding is one of the most important parts of equipment installation. Proper grounding practices ensure that the buildings and the installed equipment within them have low-impedance connections and low-voltage differentials between chassis. When you properly ground systems during installation, you reduce or prevent shock hazards, equipment damage due to transients, and data corruption. [Table 2-6](#) lists some general grounding practice guidelines.

Table 2-6 *Proper Grounding Guidelines*

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
Commercial building is subjected to direct lightning strikes. For example, some places in the United States, such as Florida, are subject to more lightning strikes than other areas.	High	All lightning protection devices must be installed in strict accordance with manufacturer recommendations. Conductors carrying lightning current should be spaced away from power and data lines in accordance with applicable recommendations and codes. Best grounding recommendations must be closely followed.
Commercial building is located in an area where lightning storms frequently occur but is not subject to direct lightning strikes.	High	Best grounding recommendations must be closely followed.
Commercial building contains a mix of information technology equipment and industrial equipment, such as welding.	Medium to high	Best grounding recommendations must be closely followed.

Table 2-6 Proper Grounding Guidelines (continued)

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment. This installation has a history of malfunction due to electromagnetic noise.	Medium	Determine source and cause of noise if possible, and mitigate as closely as possible at the noise source or reduce coupling from the noise source to the affected equipment. Best grounding recommendations must be closely followed.
New commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system in a new building is often the least expensive route and the best way to plan for the future. Best grounding recommendations should be followed as closely as possible.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system is always recommended. Best grounding recommendations should be followed as much as possible.

**Note**

In all situations, grounding practices must comply with local National Electric Code (NEC) requirements or local laws and regulations.

**Note**

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

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when modules or other FRUs are improperly handled, results in intermittent or complete failures. Modules consist of printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, always use an ESD grounding strap when handling modules.

For preventing ESD damage, follow these guidelines:

- Always use an ESD wrist strap and ensure that it makes maximum contact with bare skin.

- ESD grounding straps are available with banana plugs, metal spring clips, or alligator clips. All chassis from the Cisco Nexus 5600 series are equipped with a banana plug connector (identified by the ground symbol next to the connector) somewhere on the front panel. We recommend that you use a personal ESD grounding strap equipped with a banana plug.
- If you choose to use the disposable ESD wrist strap supplied with most FRUs or an ESD wrist strap equipped with an alligator clip, you must attach the system ground lug to the chassis in order to provide a proper grounding point for the ESD wrist strap.

**Note**

This system ground is also referred to as the network equipment building system (NEBS) ground.

- If your chassis does not have the system ground attached, you must install the system ground lug. See the [“Establishing the System Ground” section on page 2-11](#) for installation instructions and location of the chassis system ground pads.

**Note**

You do not need to attach a supplemental system ground wire to the system ground lug; the lug provides a direct path to the bare metal of the chassis.

After you install the system ground lug, follow these steps to correctly attach the ESD wrist strap:

-
- Step 1** Attach the ESD wrist strap to bare skin as follows:
- If you are using the ESD wrist strap supplied with the FRUs, open the wrist strap package and unwrap the ESD wrist strap. Place the black conductive loop over your wrist and tighten the strap so that it makes good contact with your bare skin.
 - If you are using an ESD wrist strap equipped with an alligator clip, open the package and remove the ESD wrist strap. Locate the end of the wrist strap that attaches to your body and secure it to your bare skin.
- Step 2** Grasp the spring or alligator clip on the ESD wrist strap and momentarily touch the clip to a bare metal spot (unpainted surface) on the rack. We recommend that you touch the clip to an unpainted rack rail so that any built-up static charge is then safely dissipated to the entire rack.
- Step 3** Attach either the spring clip or the alligator clip to the ground lug screw as follows:
- If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.

**Note**

The spring clip jaws do not open wide enough to fit directly over the head of the lug screw or the lug barrel.

- If you are using an ESD wrist strap that is equipped with an alligator clip, attach the alligator clip directly over the head of the system ground lug screw or to the system ground lug barrel.

To attach the ESD wrist strap to the system ground lug screw for any of the Cisco Nexus 5600 switches, clip the grounding wire to the screw that attaches the grounding lug to the switch chassis.

In addition, follow these guidelines when handling modules:

- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.

- Place a removed component board-side-up on an antistatic surface or in a static-shielding container. If you plan to return the component to the factory, immediately place it in a static-shielding container.
- Never attempt to remove the printed circuit board from the metal carrier.

**Caution**

For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohm (Mohm).

Establishing the System Ground

This section describes how to connect a system ground to the Cisco Nexus 5600 Series switch.

You must use the system ground on AC-powered systems if you are installing this equipment in a U.S. or European Central Office.

The system ground provides additional grounding for EMI shielding requirements and grounding for the low-voltage supplies (DC-DC converters) on the modules and is intended to satisfy the Telcordia Technologies requirements for supplemental bonding and grounding connections. You must observe the following system grounding guidelines for your chassis:

- You must install the system ground connection with any other rack or system power ground connections that you make. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You must connect both the system ground connection and the power supply ground connection to an earth ground. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You do not need to power down the chassis because the Cisco Nexus 5600 Series switches are equipped with AC-input power supplies.

Required Tools and Equipment

To connect the system ground, you need the following tools and materials:

- Grounding lug—A two-hole standard barrel lug. This lug supports up to 6 AWG wire. Supplied as part of accessory kit.
- Grounding screws—Two M4 x 8mm (metric) pan-head screws. These screws are supplied as part of the accessory kit.
- Grounding wire—Not supplied as part of accessory kit. The grounding wire should be sized according to 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. Commercially available 6 AWG wire is recommended. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- No. 1 Phillips screwdriver.
- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Grounding the Cisco Nexus 5600 Series Chassis

The chassis has a grounding pad with two threaded M4 holes for attaching a grounding lug. The location of the system ground on the Cisco Nexus 5600 switch is similar to that on the Cisco Nexus 5500 Platform switches.



Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last. Statement 1046



Caution

We recommend grounding the chassis, even if the rack is already grounded.



Caution

All power supplies must be grounded. The receptacles of the AC power cables used to provide power to the chassis must be the grounding type, and the grounding conductors should connect to protective earth ground at the service equipment.



Warning

When installing or replacing the unit, the ground connection must always be made first and disconnected last.

Statement 1046



Caution

Grounding the chassis is required, even if the rack is already grounded. A grounding pad with two threaded M4 holes is provided on the chassis for attaching a grounding lug. The ground lug must be NRTL listed. In addition, a copper conductor (wires) must be used and the copper conductor must comply with NEC code for ampacity.

To attach the grounding lug and cable to the chassis, follow these steps:

- Step 1** Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the grounding cable.
- Step 2** Insert the stripped end of the grounding cable into the open end of the grounding lug.
- Step 3** Use the crimping tool to secure the grounding cable in the grounding lug.
- Step 4** Remove the adhesive label from the grounding pad on the chassis.
- Step 5** Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the two M4 screws with washers through the holes in the grounding lug and into the grounding pad.
- Step 6** Ensure that the lug and cable do not interfere with other equipment.
- Step 7** Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

Starting the Switch

This section provides instructions for powering up the Cisco Nexus 5600 switch and verifying the component installation.

**Note**

Do not connect the Ethernet port to the LAN until the initial switch configuration has been performed. For instructions on configuring the switch, see the *Cisco Nexus 5600 Series CLI Configuration Guide*. For instructions on connecting to the console port, see the [“Connecting to the Console Port”](#) section on page 3-2.

**Warning**

When installing or replacing the unit, the ground connection must always be made first and disconnected last.

Statement 1046

To power up the switch and verify hardware operation, follow these steps:

Step 1 Verify that empty power supply slots have filler panels installed, the faceplates of all modules are flush with the front of the chassis, and the captive screws of the power supplies, fan module, and all expansion modules are tight.

Step 2 Verify that the power supply and the fan modules are installed.

**Note**

Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the switch to your outlet receptacle. See the [“Jumper Power Cord”](#) section on page C-8.

Step 3 Ensure that the switch is adequately grounded as described in the [“Grounding the Switch”](#) section on page 2-8, and that the power cables are connected to outlets that have the required AC power voltages (see the [“Power Specifications”](#) section on page B-3).

Step 4 For the switch, insert each end of the power clip (from the accessory kit) into holes on tabs located on either side of the power connectors.

Step 5 Connect each power cable to the power connectors on the chassis and an AC power source. Press the power cable into the power clip to endure that the power cable stays connected to the chassis when bumped. The switch should power on as soon as you connect the power cable.

Step 6 Listen for the fans; they should begin operating when the power cable is plugged in.

Step 7 After the switch boots, verify that the LED operation is as follows:

- Fan module—Status LED is green.
- Power supply—Status LED is green.
- After initialization, the system status LED is green, indicating that all chassis environmental monitors are reporting that the system is operational. If this LED is orange or red, then one or more environmental monitor is reporting a problem. This system status LED will start to blink when there is a major environmental alarm indicating that the system will shutdown shortly.
- The Link LEDs for the Ethernet connector should not be on unless the cable is connected.



Note The LED for the Ethernet connector port remains off until the port is connected.

Step 8 Try removing and reinstalling a component that is not operating correctly. If it still does not operate correctly, contact your customer service representative for a replacement.



Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: <http://www.cisco.com/c/en/us/support/web/tsd-cisco-worldwide-contacts.html>.

Step 9 Verify that the system software has booted and the switch has initialized without error messages.

If you cannot resolve an issue, contact your customer service representative.

Step 10 Complete the worksheets provided in [Appendix G, “Site Planning and Maintenance Records”](#) for future reference.



Note A setup utility automatically launches the first time 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 5600 Series CLI configuration guide.
