Installing a Cisco Nexus Fabric Extender

This chapter describes how to install the Cisco Nexus Fabric Extenders (FEXs) and includes the following sections:

Note Before you install, operate, or service the system, read the *Regulatory Compliance and Safety Information* 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

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

Preparing for Installation

This section includes the following topics:

Installation Options

The Cisco Nexus FEX can be installed using the following methods:

- In an open EIA rack, using the following items:
  - The rack-mount kit shipped with the device
  - The EIA Shelf Bracket Kit (an optional kit, purchased separately)
- In a perforated or solid-walled EIA cabinet, using one of the following:
  - The rack-mount kit shipped with the device
  - The EIA Shelf Bracket Kit (an optional kit, purchased separately)

For instructions on installing the device using the rack-mount kit shipped with the device, see the "Installing the Cisco Nexus Fabric Extender Chassis in a Cabinet or Rack" section on page 2-6.

Note The optional EIA Shelf Bracket Kit is not provided with the device. To order the kit, contact your device provider.

Airflow Considerations

Airflow through the Cisco Nexus FEX is from the port side exhaust to the back or the back to the port side exhaust. To ensure proper airflow, follow these guidelines:

- Position the chassis so that its air intake side (port side exhaust side for port side exhaust airflow or back side for port side intake airflow) is in a cold aisle. Otherwise, an overtemperature condition can occur and the system can shut down.
- Avoid having the air intake where other systems exhaust air.
- Due to the shallow depth of the Cisco Nexus FEX, it is also possible for air to recirculate across the top and bottom of the chassis in a partially populated rack.
- Make sure that the fan tray and power supply modules all use the same direction of airflow. All of the modules should have no black stripe (port side exhaust airflow) or all of the modules should have a black stripe (port side intake airflow).

Note If the switch is powered up with modules that have different airflow directions, you need to shut down the switch before replacing the modules with the wrong airflow direction.

- Maintain ambient airflow throughout the data center to ensure normal operation.
- Consider the heat dissipation of all equipment when determining air-conditioning requirements. When evaluating airflow requirements, take into consideration that hot air generated by equipment at the bottom of the rack can be drawn in the intake ports of the equipment above.
- If you mount a chimney type of rack, avoid mounting it in a way that is contrary to the direction of flow in the chimney, where the chimney overpowers the system fans.

Chassis Weight

When lifting the system, follow these guidelines:

- Disconnect all power and external cables before lifting the system.
- Have two people lift the system. The Cisco Nexus FEXs can weigh up to 18.5 pounds (8.4 kg).
- Ensure that your footing is solid and the weight of the system is evenly distributed between your feet.
- Lift the system 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 FEX, follow these guidelines:

- Plan your site configuration and prepare the site before installing the chassis. Appendix G, “Site Preparation and Maintenance Records,” lists the recommended site planning tasks.
- Record the information listed in Appendix G, “Site Preparation and Maintenance Records,” as you install and configure the device.
- Ensure that there is adequate space around the device to allow for servicing the device and for adequate airflow (Appendix B, “Technical Specifications,” lists airflow requirements).
- Ensure that the air-conditioning meets the heat dissipation requirements listed in Appendix B, “Technical Specifications,”
- Ensure that the chassis air intake will be located in a cold aisle and away from the exhaust of other systems.
- Ensure that all of the fan tray and power supply modules have the same direction of airflow as follows (the switch supports only one airflow direction for all modules):
  - Port-side intake airflow modules have black stripes.
  - Port-side exhaust airflow modules have no colored stripes.

Note If the switch is powered up with modules that have different airflow directions, you need to shut down the switch before replacing the modules with the wrong airflow direction.

- 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-9.

- Ensure that the chassis is adequately grounded. If the device is not mounted in a grounded rack, we recommend connecting both the system ground on the chassis and the power supply ground 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 uninterrupted 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 FEX, 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 device are within the current ratings for the wiring and breakers.

- Use the following screw torques when installing the device:
  - Captive screws: 4 in-lb
  - M3 screws: 4 in-lb
  - M4 screws: 12 in-lb
  - 10-32 screws: 20 in-lb
  - 12-24 screws: 30 in-lb

Required Tools and Equipment

Before beginning the installation, ensure that the following items are ready:

- Number 1 and number 2 Phillips screwdrivers with torque capability
- 3/16-inches 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 Cisco Nexus FEX to proper grounding facilities
- Crimping tool large enough to accommodate girth of lug

- Wire-stripping tool

Unpacking and Inspecting the Cisco Nexus Fabric Extender

Caution When handling device components, wear an ESD wrist strap and handle modules by the 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 device 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:

- Print documentation
- 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

Step 3 Make sure that the fan tray and power supplies all use the same direction of airflow.

- Port-side exhaust airflow modules do not have a black stripe across the front of the module.
- Port-side intake airflow modules have a black stripe across the front of the module.

Installing the Cisco Nexus Fabric Extender Chassis in a Cabinet or Rack

This section describes how to use the rack-mount kit provided with the device to install the Cisco Nexus Fabric Extender 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.

Table 2-1 lists the items contained in the rack-mount kit provided with the device.

Table 2-1 Cisco Nexus 2000 Series FEX Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
12	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
10	10-32 rack nuts
10	10-32 x 3/4-inch Phillips pan head screws
2	Slider rails

Table 2-1 lists the items contained in the rack-mount kit provided with the device.

Table 2-2 Cisco Nexus 2300 Series FEX Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
2	M4 8-mm Phillips pan head screws
2	Rack-mount guides
10	M4 x 0.7 x 7 mm rack nuts
10	10-32 x 3/4-inch Phillips pan head screws
2	Slider rails

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

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

a. Position a front rack-mount bracket against the chassis and align the screw holes. Attach the front rack-mount bracket to the chassis with six of the M4 screws.

b. Repeat with the other front rack-mount bracket on the other side of the device.

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

a. Position one of the rack-mount brackets against the side of the device and align the screw holes. Attach the bracket to the device with two of the flat-head M4 screws.

b. Repeat with the other rack-mount bracket on the other side of the device.

Step 3 Attach the slider rails to the rack. Use two 12-24 screws or two 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.

a. Repeat with the other slider rail on the other side of the rack.

b. Use the tape measure and level to verify that the rails are horizontal and at the same height.

Step 4 Insert the device into the rack as follows:

a. Using both hands, position the device with the back of the device between the port side exhaust posts of the rack.

b. Align the two rack-mount guides on either side of the device with the slider rails installed in the rack. Slide the rack-mount glides onto the slider rails, and then gently slide the device all the way into the rack. If the device does not slide easily, try realigning the rack-mount glides on the slider rails.

Step 5 Stabilize the device in the rack by attaching the front rack-mount brackets to the front rack-mounting rails as follows:

a. 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.

b. Repeat for the front rack-mount bracket on the other side of the device.

Grounding the System

This section describes the need for system grounding and explains how to prevent damage from electrostatic discharge.

This section includes the following topics:

Proper Grounding Guidelines

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 2-3 lists some general grounding practice guidelines.

Table 2-3 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	Grounding recommendations must be closely followed.
Commercial building contains a mix of information technology equipment and industrial equipment, such as welding.	Medium to high	Grounding recommendations must be closely followed.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment. This installation has a history of malfunction due to electromagnetic noise.	Medium	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. Grounding recommendations must be closely followed.

Table 2-3 Proper Grounding Guidelines

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
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. 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. 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 devices 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 Field Replaceable Units (FRUs) are improperly handled, results in intermittent or complete failures. Devices 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 Cisco Nexus 2000 Series FEX chassis are equipped with a banana plug connector (identified by the ground symbol next to the connector) somewhere on the port side exhaust 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 2-13 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 your bare skin as follows:

a. 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.

b. 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 (see Figure 2-1 and Figure 2-2):

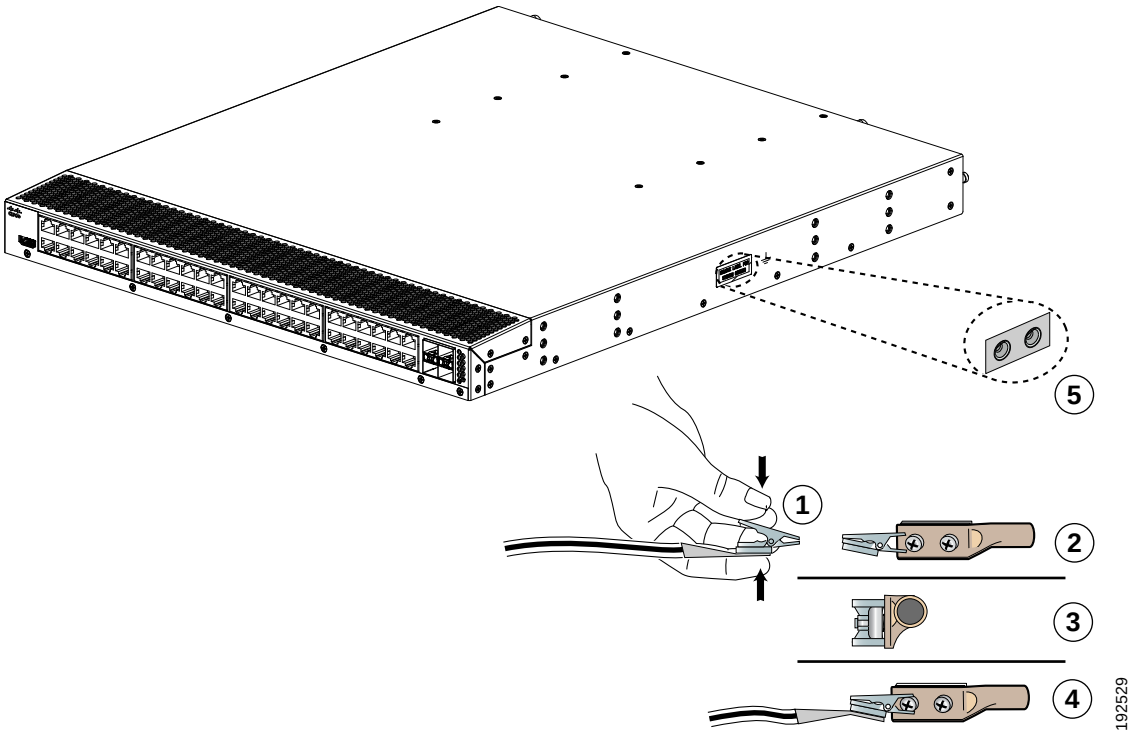
a. If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.

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

b. 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.

Figure 2-1 shows how to attach the ESD wrist strap to the system ground lug screw for the Cisco Nexus 2000 Series FEX.

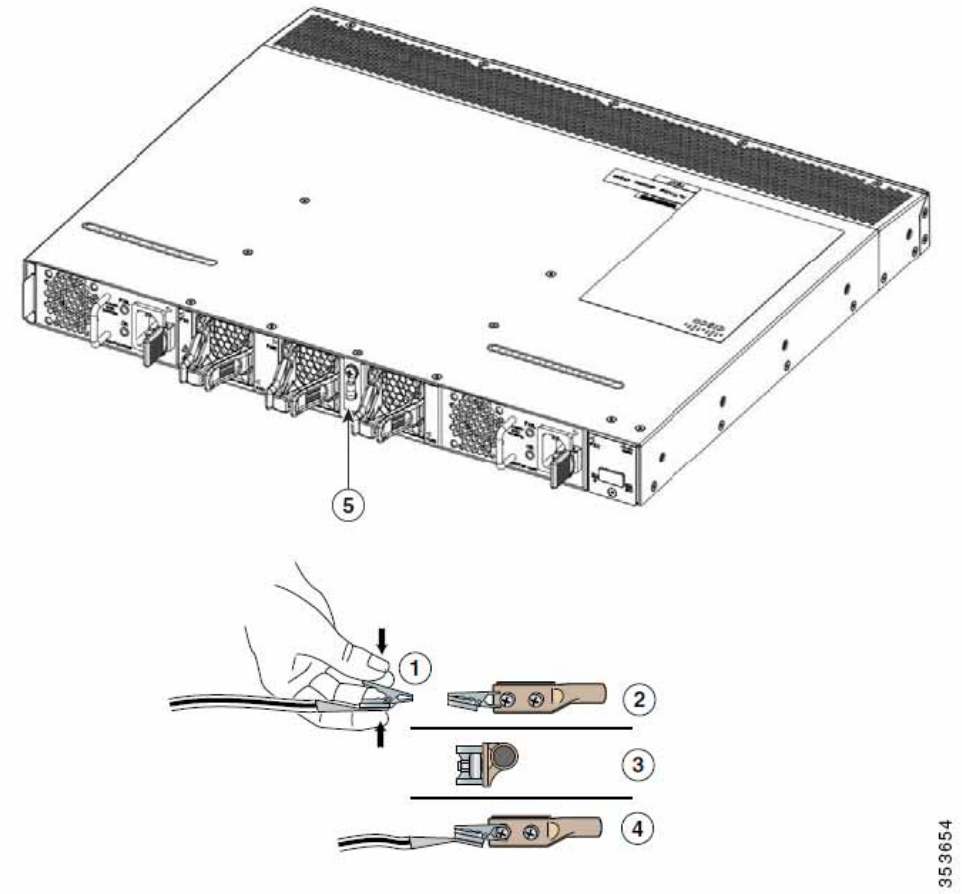
Figure 2-1 Attaching the ESD Wrist Strap to the System Ground Lug Screw for a Cisco Nexus 2000 Series FEX



1	ESD ground strap	**4**	Clip installed (behind screw)
2	Clip and grounding lug	**5**	System ground connector
3	Side view of grounding lug (clip slid behind screw)		

Note For the Cisco Nexus 2300 Series FEX, the ground lug holes have been moved from the side to the rear of the system. Figure 2-2. shows the Cisco Nexus 2348UPQ FEX.

Figure 2-2 Cisco Nexus 2300 Series FEX Ground Lug Location



1	ESD ground strap	**4**	Clip installed (behind screw)
2	Clip and grounding lug	**5**	Ground Lug
3	Side view of grounding lug (clip slid behind screw)		

In addition, follow these guidelines when handling these devices:

- 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 2000 and 2300 Series FEXs.

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

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

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

- You must install the system (NEBS) 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 (NEBS) ground connection and the power supply ground connection to an earth ground. The system (NEBS) 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 FEX is 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 that supports up to 6 AWG wire. This lug is supplied as part of accessory kit.
- Grounding screws—Two M4 x 8mm (metric) pan-head screws. The screws are supplied as part of the accessory kit.
- Grounding wire—Not supplied as part of the 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 device 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 Chassis

The chassis has a grounding pad with two threaded M4 holes for attaching a grounding lug.

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

Caution We recommend that you ground the chassis, even if the rack is already grounded.

Caution You must ground all power supplies. 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 if you are using DC power supplies, 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, the copper conductor (wires) must be used and the copper conductor must comply with the NEC code.

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 Cisco Nexus Fabric Extender

This section describes how to power up the device and verify the hardware operation.

Note Do not connect the Ethernet port to the LAN until the initial device configuration has been performed. For instructions on configuring the device, see the *Cisco Nexus 2300 Series Fabric Extender Software Configuration Guide*. For instructions on connecting to the Ethernet ports, see the "Connecting the Cisco Nexus Fabric Extender" section.

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

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

Step 1 Verify that the empty power supply bays have filler panels installed, the faceplates of all modules are flush with the port side exhaust of the chassis, and the captive screws of the power supplies, fan tray, and all expansion modules are tight.

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

Note Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco Nexus 2000 Series FEX to your outlet receptacle. See the "Jumper Power Cord" section on page C-9.

Step 3 Ensure that the device is adequately grounded as described in the "Grounding the System" section on page 2-7.

Step 4 If you are installing an AC power supply, connect the power supply to an AC power source as follows:

a. Plug the power cable into the power receptacle on the power supply.

b. Attach the other end of the power cable to the AC power source.

c. If you are connecting cables to a Cisco Nexus 2148T power supply, flip the switch above the AC receptacle on the power supply to ON.

d. Verify that the power supply is functioning by making sure that the OK LED turns green and the FAULT LED is off.

Step 5 If you are installing a DC power supply, connect the power supply to a DC power source as follows:

a. Make sure that the DC power source is turned off at the circuit breaker.

b. Connect a negative cable from the power source to the left terminal on the power supply and fasten with the screw from that terminal. This terminal is labeled negative (-) on newer power supplies and is labeled incorrectly as positive (+) on the first power supplies sold.

c. Connect a positive cable from the power source to the right terminal on the power supply and fasten with the screw from that terminal. This terminal is labeled positive (+) on newer power supplies and is labeled incorrectly as negative (-) on the first power supplies sold.

d. Turn on the power at the circuit breaker.

e. Verify that the power supply is functioning by making sure that the OK LED turns green and the FAULT LED is off.

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

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

- Power supply—The system 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, one or more environmental monitor is reporting a problem.
- The Link LEDs for the Ethernet connector should not be on unless the cable is connected.

If a component is not operating correctly, remove and reinstall that component. 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 8 Verify that the system software has booted and the device has initialized without error messages.

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

Step 9 Complete the worksheets provided in “Site Preparation and Maintenance Records” for future reference.

Removing and Installing Components

This section describes how to remove and install components on the Cisco Nexus 2000 and 2300 Series FEXs.

This section includes the following topics:

Caution To prevent ESD damage, wear grounding wrist straps during these procedures and handle modules by the carrier edges only.

Removing and Installing Power Supplies

The Cisco Nexus 2000 Series FEX supports two power supplies, but the FEX uses only one power supply for operations. The other power supply is for redundancy.

Caution Whenever you replace a power supply, make sure that it has the same direction of airflow as the rest of the module in the switch (all fan tray and power supply modules must have the same direction of airflow and the same color designation for the airflow direction or else the switch can over heat and shut down.

Note If you power up a FEX with power supply and fan tray modules that have different directions of airflow, an error condition will occur and the switch can over heat and shut down. With this error condition, you must shut down the switch to replace the modules that do not take in cool air from the cold aisle. After you ensure that all of the modules have the same direction of airflow and that they take in cooling air from the cold aisle, you can power up the FEX.

This section includes the following topics:

Note You can replace a faulty power supply while the system is operating if the other power supply is functioning.

Removing an AC Power Supply

Caution If you are using the Cisco Nexus 2000 or 2300 Series FEX with one power supply, removing the power supply causes the device to shut down. If you are using two power supplies and you remove one of them, the device continues to operate.

To remove an AC power supply, follow these steps:

Step 1 Pull the power cord out from the power receptacle on the power supply.

Step 2 Release the power supply from the chassis as follows:

- If you are removing a power supply from a Cisco Nexus 2148T chassis, loosen the captive screw and then pull the power supply part way out of the chassis.
- If you are removing a power supply from a Cisco Nexus 2248T, 2232PP, or 2224TP chassis, push and hold the thumb latch to the left and pull 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.

Step 4 If the power supply bay is to remain empty, install a blank power supply filler panel.

Installing an AC Power Supply

Caution Be sure that the power supply that you are installing has the same airflow direction as the fan tray module and the other power supply. Either all of the modules must have port-side exhaust airflow (blue or no color on the front of the module) or all of the modules must have port-side intake airflow (red or black color on the front of the module). To prevent over heating, the switch does not support more than one airflow direction for the modules in the chassis.

To install a power supply, follow these steps:

Step 1 Ensure that the system (earth) ground connection has been made for the chassis. For ground connection instructions, see the "Grounding the System" section on page 2-7.

Step 2 If the power supply bay has a filler panel, remove it from the slot as follows:

- If you are removing a filler panel from a Cisco Nexus 2248TP, 2232PP, or 2224TP FEX, push its thumb latch to the left and pull the panel out of the chassis.
- If you are removing a filler panel from a Cisco Nexus 2148T FEX, loosen its captive screw, and then pull the panel out of the power supply bay.

Step 3 Hold the replacement power supply by its handle and position it so that the captive screw is on the left, and then slide it into the power supply bay, ensuring that the power supply is fully seated in the bay.

Step 4 Secure the power supply to the chassis as follows:

- If you are installing a Cisco Nexus 2248TP, 2232PP, or 2224TP FEX, make sure that the thumb latch engages with the chassis so that the power supply is held in the slot.
- If you are installing a Cisco Nexus 2148T, fasten the power supply to the chassis by screwing its captive screw into its hole in the chassis and tightening it.

Note Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco Nexus 2000 Series FEX to your outlet receptacle. See the "Jumper Power Cord" section on page C-9.

Step 5 Connect the other end of the power cable to an AC power source.

Caution In a system with dual power supplies, connect each power supply to a separate power source. If a power source failure occurs, the second source will most likely still be available.

Step 6 Verify power supply operation by checking that the power supply LED is green. For information about what the power supply LEDs indicate, see the "Power Supply Status" section on page E-3.

Removing a DC Power Supply

Caution If you are using the Cisco Nexus 2200 platform FEX with one DC power supply, removing the power supply causes the device to shut down. If you are using two power supplies and you remove one of them, the device continues to operate.

To remove a DC power supply, follow these steps:

Step 1 Shut off the DC power to the power supply at the circuit breaker. Make sure that both LEDs are off.

Step 2 Unfasten the positive power cable from the right terminal.

Step 3 Unfasten the negative power cable from the left terminal.

Step 4 Press the thumb latch to disengage the power supply from the chassis and use the handle to pull it part way out of the chassis.

Step 5 Place your other hand under the power supply to support it while you slide it out of the chassis. Place the power supply on an antistatic surface.

Step 6 If the power supply bay is to remain empty, install a blank power supply filler panel.

Installing a DC Power Supply

In a system with dual power supplies, connect each power supply to a separate power source. If a power source failure occurs, the second source will most likely still be available.

Caution Be sure that the power supply that you are installing has the same airflow direction as the fan tray module and the other power supply. Either all of the modules must have port-side exhaust airflow (blue or no color on the front of the module) or all of the modules must have port-side intake airflow (red or black color on the front of the module). To prevent over heating, the switch does not support more than one airflow direction for the chassis.

To install a power supply, follow these steps:

Step 1 Ensure that the system (earth) ground connection has been made for the chassis. For ground connection instructions, see the "Grounding the System" section on page 2-7.

Step 2 If the power supply bay has a filler panel, push and hold the thumb latch to the left, and then slide the filler panel out of the power supply bay.

Step 3 Hold the replacement power supply by the handle and position it so that the thumb latch is on the right, and then slide it into the power supply bay, ensuring that the power supply is fully seated in the bay.

Step 4 Engage the thumb latch so that the power supply is firmly held in place in its slot.

Step 5 Fasten the positive cable from the power source to the right terminal on the power supply. This terminal is labeled positive (+) on newer power supplies and is labeled incorrectly as negative (-) on the first power supplies sold.

Step 6 Fasten the negative cable from the power source to the left terminal on the power supply. This terminal is labeled negative (-) on newer power supplies and is labeled incorrectly as positive (+) on the first power supplies sold.

Step 7 Turn on the power at the circuit breaker.

Step 8 Verify power supply operation by checking that the power supply LED is green. For information about what the power supply LEDs indicate, see the "Power Supply Status" section on page E-3.

Removing and Installing a Fan

The Cisco Nexus 2300 Series FEXs support three fans, but the FEX needs only two fans for operation. The other fan is for redundancy. Individual fans are designed to be removed and replaced while the system is operating, without causing an electrical hazard or damage to the system.

If you are replacing a fan tray on a Cisco Nexus 2200 Series FEX, or Cisco Nexus 2148T FEX, see the "Removing and Installing the Fan Tray" section on page 2-21.

Caution Be sure that the fan that you are installing has the same airflow direction as the other fans and power supply modules in the same chassis. Either all of the modules must have port-side exhaust airflow (a blue or no color on the front of the module) or all of the modules must have port-side intake airflow (red or black color on the front of the module). If the modules have different airflow directions in the same chassis, an error condition occurs, the switch can over heat, and the switch can shut down.

Note If you power up a FEX with power supply and fan modules that have different directions of airflow, an error condition will occur and the switch can over heat and shut down. With this error condition, you must shut down the switch to replace the modules that do not take in cool air from the cold aisle. After you ensure that all of the modules have the same direction of airflow and take in cooling air from the cold aisle, you can power up the FEX.

This section includes the following topics:

- Removing a Fan, page 2-20
- Installing a Fan, page 2-20

Removing a Fan

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you finish removing the fan tray.** Statement 258

To remove a fan, follow these steps:

Step 1 Pinch the two protruding tabs of the fan towards each other to release the latch and pull the fan outward.

Step 2 Pull the fan clear of the chassis and set it on an antistatic surface or repack it in packing materials.

Installing a Fan

To install a fan, follow these steps:

Step 1 Place the fan into the port-side exhaust chassis cavity so it rests on the chassis, and then push the fan into the chassis as far as it can go until it is latched in place.

Step 2 Listen for the fan if the device is powered on. You should immediately hear it operating. If you do not hear it, ensure that the fan is inserted completely in the chassis and the faceplate is flush with the outside surface of the chassis.

Step 3 Verify that the LED is green. If the LED is not green, the fan is faulty. If this problem occurs, contact your customer service representative for a replacement part.

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.

Removing and Installing the Fan Tray

The Cisco Nexus 2200 Series FEXs, and Cisco Nexus 2148T FEX, use a fan tray. The fan tray is designed to be removed and replaced while the system is operating without causing an electrical hazard or damage to the system, if the replacement is performed within 1 minute.

Caution Be sure that the fan tray that you are installing has the same airflow direction as the other fan tray and power supply modules in the same chassis. Either all of the modules must have port-side exhaust airflow (a blue or no color on the front of the module) or all of the modules must have port-side intake airflow (red or black color on the front of the module). If the modules have different airflow directions in the same chassis, an error condition occurs, the switch can over heat, and the switch can shut down.

Note If you power up a FEX with power supply and fan tray modules that have different directions of airflow, an error condition will occur and the switch can over heat and shut down. With this error condition, you must shut down the switch to replace the modules that do not take in cool air from the cold aisle. After you ensure that all of the modules have the same direction of airflow and take in cooling air from the cold aisle, you can power up the FEX.

This section includes the following topics:

Removing a Fan Tray

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you finish removing the fan tray.** Statement 258

To remove a fan tray, follow these steps:

Step 1 Loosen the captive screws on the fan tray by turning them counterclockwise, using a flat-blade or number 2 Phillips screwdriver if required.

Step 2 Grasp the captive screws of the fan tray and pull it outward.

Step 3 Pull the fan tray clear of the chassis and set it on an antistatic surface or repack it in packing materials.

Note If you remove a fan tray while the system is running, you must install the new fan tray within 1 minute to prevent overheating.

Installing a Fan Tray

To install a fan tray, follow these steps:

Step 1 Hold the fan tray with the sheet metal flange holding the connector on the bottom.

Step 2 Place the fan tray into the port-side exhaust chassis cavity so it rests on the chassis, and then push the fan tray into the chassis as far as it can go until the captive screw makes contact with the chassis.

Step 3 Tighten the captive screw.

Step 4 Listen for the fans if the device is powered on. You should immediately hear them operating. If you do not hear them, ensure that the fan tray is inserted completely in the chassis and the faceplate is flush with the outside surface of the chassis.

Step 5 Verify that the LED is green. If the LED is not green, one or more fans are faulty. If this problem occurs, contact your customer service representative for a replacement part.

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.

Removing the Cisco Nexus Fabric Extender

Caution The slider rail and port side exhaust rack-mount brackets do not have a stop mechanism when sliding in and out. If the port side exhaust of the chassis is unfastened from the rack and the chassis slides forward on the slider rails, it may slip off the end of the rails and fall out of the rack.

To remove the Cisco Nexus 2000 Series FEX from a rack, follow these steps:

Step 1 Ensure that the weight of the FEX is fully supported and that the device is being held by another person.

Step 2 Turn off the power at the circuit breaker.

Step 3 Disconnect the power cord as follows:

- For AC power supplies, disconnect the power cord and the console cables.
- For DC power supplies, disconnect the positive cable from the negative (-) terminal, and disconnect the negative cable from the positive (+) terminal.

Step 4 Disconnect all ports.

Step 5 Remove the screws that fasten the port side exhaust rack-mount brackets to the mounting rails.

Step 6 Gently slide the chassis toward you, off of the slider rails and out of the rack.

Repacking the Cisco Nexus Fabric Extender for Return Shipment

If you need to return the Cisco Nexus 2000 and 2300 Series FEX, remove the device from the rack by following the steps in the "Removing the Cisco Nexus Fabric Extender" section on page 2-22, and repack it for shipment. If possible, use the original packing materials and container to repack the device. Contact your Cisco customer service representative to arrange for return shipment to Cisco.