BROCADE

HARDWARE INSTALLATION GUIDE

Brocade G610 Hardware Installation Guide

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Contents

Preface

Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Brocade technical documentation.

Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE
A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

CAUTION
A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER
A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used to highlight specific words or phrases.

Format	Description
bold text	Identifies command names.
	Identifies keywords and operands.
	Identifies the names of GUI elements.
	Identifies text to enter in the GUI.
italic text	Identifies emphasis.
	Identifies variables.
	Identifies document titles.
`Courier font`	Identifies CLI output.

Format	Description
	Identifies command syntax examples.

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
italic text	Identifies a variable.
value	In Fibre Channel products, a fixed value provided as input to a command option is printed in plain text, for example, **--show** WWN.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options. In Fibre Channel products, square brackets may be used instead for this purpose.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Brocade resources

Visit the Brocade website to locate related documentation for your product and additional Brocade resources.

White papers, data sheets, and the most recent versions of Brocade software and hardware manuals are available at www.brocade.com. Product documentation for all supported releases is available to registered users at MyBrocade.

Click the **Support** tab and select **Document Library** to access product documentation on MyBrocade or www.brocade.com. You can locate documentation by product or by operating system.

Release notes are bundled with software downloads on MyBrocade. Links to software downloads are available on the MyBrocade landing page and in the Document Library.

Document feedback

Quality is our first concern at Brocade, and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. You can provide feedback in two ways:

- Through the online feedback form in the HTML documents posted on www.brocade.com
- By sending your feedback to documentation@brocade.com

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.

Contacting Brocade Technical Support

As a Brocade customer, you can contact Brocade Technical Support 24x7 online or by telephone. Brocade OEM customers should contact their OEM/solution provider.

Brocade customers

For product support information and the latest information on contacting the Technical Assistance Center, go to www.brocade.com and select **Support**.

If you have purchased Brocade product support directly from Brocade, use one of the following methods to contact the Brocade Technical Assistance Center 24x7.

Online	Telephone
Preferred method of contact for non-urgent issues: • Case management through the MyBrocade portal. • Quick Access links to Knowledge Base, Community, Document Library, Software Downloads and Licensing tools	Required for Sev 1-Critical and Sev 2-High issues: • Continental US: 1-800-752-8061 • Europe, Middle East, Africa, and Asia Pacific: +800-AT FIBREE (+800 28 34 27 33) • Toll-free numbers are available in many countries. • For areas unable to access a toll-free number: +1-408-333-6061

Brocade OEM customers

If you have purchased Brocade product support from a Brocade OEM/solution provider, contact your OEM/solution provider for all of your product support needs.

- OEM/solution providers are trained and certified by Brocade to support Brocade® products.
- Brocade provides backline support for issues that cannot be resolved by the OEM/solution provider.
- Brocade Supplemental Support augments your existing OEM support contract, providing direct access to Brocade expertise. For more information, contact Brocade or your OEM.
- For questions regarding service levels and response times, contact your OEM/solution provider.

About This Document

Supported hardware and software

This document is applicable to the Brocade G610 FC switch running Fabric OS 8.1.0 or later. The following table lists the rack mount kits supported with this device.

TABLE 1 Rack mount kits

Part number	Description
XBR-R000070	Slide rack mount kit
XBR-R000162	Fixed-mount kit for four-post racks
XBR-000165	Mid-mount kit for two-post racks
XNA-000072	Non-port side fixed mount rack kit (15"-20") for four-post racks

What's new in this document

The following changes are made to this document from its previous version.

- Specifying "1000/100/10 Mbps Ethernet port" for Ethernet Management ports in Brocade G610 Technical Specifications on page 77.

Device Overview

Hardware features

The Brocade G610 switch offers the following features and capabilities:

- Up to 24 auto-sensing ports supporting 32-Gbps SFP+ technology in a single domain.
- Dynamic Ports on Demand (Dynamic-POD) scaling from a base configuration of 8 ports to 24 ports (two 8-port SFP+ POD).
- 4-, 8-, 16-, and 32-Gbps auto-sensing Fibre Channel switch ports.
  - A 32-Gbps optical transceiver can auto-negotiate to 32 Gbps, 16 Gbps, or 8 Gbps.
  - A 16-Gbps optical transceiver can auto-negotiate to 16 Gbps, 8 Gbps, or 4 Gbps.

    NOTE
    The port speed is determined by the maximum speed supported by the optical transceivers at the either end of the link.

- Universal ports self-configure as a E_Ports, F_Ports, M_Ports, or D_Ports.
  - A Diagnostic Port (D_Port) provides diagnostics, troubleshooting, and verification services for the physical media.
- One built-in fixed power supply unit (not a FRU) with a port-side power inlet.
- Four integrated fans (no fan FRUs) for cooling the system. This allows a single fan failure and permits the switch to continue to function properly if a fan fails. Only nonport-side intake airflow for cooling is supported.
  - If one fan fails and the temperature is less than 56C, the fans run at high speed. If the temperatures increases more than 56C, a critical temperature warning is displayed and the device shuts down in two minutes.
  - If two fans fail and the temperature is less than 55C, the fans run at high speed. If the temperature increases more than 55C, a critical temperature warning is displayed and the device shuts down in two minutes.
  - If the third fans fails, a warning is displayed and the device is immediately shut down.
- Hardware-enabled input and output (I/O) latency statistics collection.
- Hardware-enabled VM support.
- 1U chassis that can be installed as a standalone unit or mounted in a standard Electronic Industries Association (EIA) 48.26cm (19 inches) cabinet or rack.
- Support for Brocade small form-factor pluggable plus (SFP+) optical transceivers in any combination of Short Wavelength (SWL), Long Wavelength (LWL), or Extended Long Wavelength (ELWL) optical media.
- Extended distance Fibre Channel to support long distance native FC connectivity.
- Port-to-port latency is minimized to 900 nanoseconds including FEC using cut-through frame switching at 32 Gbps.
- A dual-core T1022E processor operating at 1.2 GHz delivers high performance, scalability, and advanced Fabric Vision functionality.

- One 10BASE-T / 100BASE-TX / 1000BASE-T RJ45 connector Ethernet port for management. In conjunction with EZSwitchSetup, this port supports switch IP address discovery and configuration, eliminating the need to attach a serial cable to configure the switch IP address.
- A RS-232 3-wire (Tx, Rx, and Gnd) universal asynchronous receiver/transmitter (UART) serial port to BMC adapter with a RJ-45 connector for debugging initial switch setup (if not using EZSwitchSetup) and factory default restoration is included with the switch. Although there are LEDs in the adapter, they are not used.
- An internal e-USB module with 2 GB of persistent storage. This provides increased serviceability, and error logging functionality by facilitating easier firmware upgrades and downloads of the system log files.
- One external USB connector.
- 24 hot-pluggable SFP+ optical transceiver slots.
- 24 bicolor (green/amber) LEDs to indicate the status for each port.
- One green LED to indicate valid system power.
- One bicolor (green/amber) LED to indicate the system status.
- Two Ethernet LEDs: one bicolor (green/amber) LED to indicate link speed (1000/100/10 Mbps) and one green LED to indicate traffic activity.
- A Serial EEPROM for switch identification.
- Real-time fan monitoring.
- Real-time digital thermometers for temperature monitoring.
- Real-time clock (RTC) with battery.

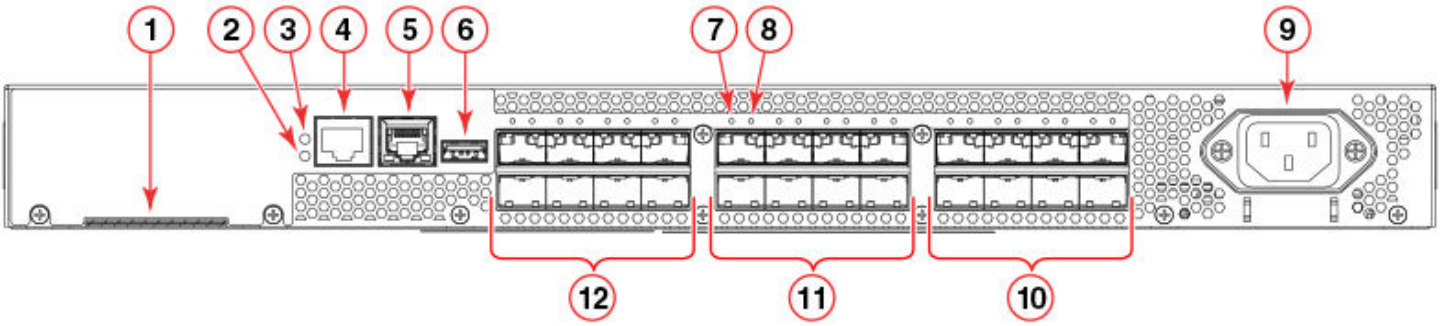
License options

The Brocade G610 uses a capacity-based Dynamic Ports on Demand (POD) license method and can be purchased with 8, 16, or 24 licensed ports. The first eight ports (0-7) are enabled by default. To enable the remaining sixteen ports, you need to purchase and install two 8-port POD license keys. Refer to the *Brocade Fabric OS Software Licensing Guide* for more details.

Port-side view

The following illustration shows the port-side view of the Brocade G610 Fibre Channel switch.

FIGURE 1 Port-side view

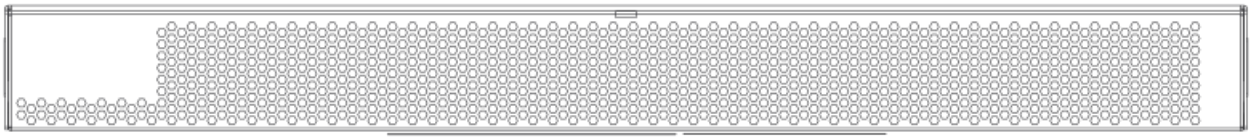


1. Switch ID pull-out tab
2. System status LED
3. System power LED
4. System RS232 console port (RJ-45)
5. Ethernet port with two Ethernet status LEDs
6. USB port
7. SFP+ FC port 8 (upper) status LED
8. SFP+ FC port 12 (lower) status LED
9. AC power receptacle
10. Trunk port group 2 (SFP+ FC ports 16-23)
11. Trunk port group 1 (SFP+ FC ports 8-15)
12. Trunk port group 0 (SFP+ FC ports 0-7)

Nonport-side view

The nonport-side of the device is used solely for air flow.

FIGURE 2 Nonport-side view



Device management options

You can use the management functions built into the device to monitor the fabric topology, port status, physical status, and other information to help you analyze switch performance and to accelerate system debugging. The device automatically performs a power-on self-test (POST) each time it is turned on. A RASlog message is generated for any detected startup errors.

You can manage the device using any of the management options listed in the following table.

TABLE 2 Management options for the device

Management tool	Out-of-band support	Reference documents
Command line interface (CLI) Up to two admin sessions and four user sessions simultaneously.	Ethernet or serial connection	*Brocade Fabric OS Administration Guide* *Brocade Fabric OS Command Reference*
Brocade EZSwitchSetup EZSwitchSetup helps to complete the basic configuration for single-switch setup.	Ethernet or serial connection	*EZSwitchSetup Software Installation Guide* *EZSwitchSetup Administrator's Guide*

TABLE 2 Management options for the device (continued)

Management tool	Out-of-band support	Reference documents
Brocade Web Tools	Ethernet or serial connection	*Brocade Web Tools Administration Guide*
Standard SNMP applications	Ethernet or serial connection	*Fabric OS MIB Reference*
Management Server	Ethernet or serial connection	*Brocade Fabric OS Administration Guide* *Brocade Fabric OS Command Reference*
Brocade Network Advisor (BNA) BNA must be purchased separately.	Ethernet or serial connection	Brocade Network Advisor documentation set

Preparing for the Installation

Safety precautions

When using this product, observe all danger, caution, and attention notices in this manual. The safety notices are accompanied by symbols that represent the severity of the safety condition

Refer to Cautions and Danger Notices at the end of this guide for translations of safety notices for this product.

General precautions

DANGER
The procedures in this manual are for qualified service personnel.

DANGER
Before beginning the installation, see the precautions in "Power precautions."

CAUTION
Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

CAUTION
Make sure the airflow around the front, and back of the device is not restricted.

CAUTION
Never leave tools inside the chassis.

CAUTION
To protect the serial port from damage, keep the cover on the port when not in use.

CAUTION
Do not install the device in an environment where the operating ambient temperature might exceed 40°C (104°F).

CAUTION
The device must be installed only indoors because the Ethernet ports are not TNV-1 compliant and the device, the AC power adapter, and the cables are not designed for outdoor use.

ESD precautions

DANGER
For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

CAUTION
Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

CAUTION
Static electricity can damage the chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

NOTE
Wear a wrist grounding strap connected to the chassis ground (if the device is plugged in) or to a bench ground.

Power precautions

DANGER
Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

DANGER
If the installation requires a different power cord than the one supplied with the device, make sure you use a power cord displaying the mark of the safety agency that defines the regulations for power cords in your country. The mark is your assurance that the power cord can be used safely with the device.

DANGER
This device might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing.

DANGER
Disconnect the power cord from all power sources to completely remove power from the device.

DANGER
To avoid high voltage shock, do not open the device while the power is on.

DANGER
Batteries used for RTC/NVRAM backup are not located in operator-access areas. There is a risk of explosion if a battery is replace by an incorrect type. Dispose of used components with batteries according to local ordinance and regulations.

CAUTION
Use a separate branch circuit for each power cord, which provides redundancy in case one of the circuits fails.

CAUTION
Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating limit for the circuit. The maximum ampere ratings are usually printed on the devices near the input power connectors.

NOTE
Device control processors and management modules may contain batteries for RTC or NVRAM backup. Dispose of components containing batteries as required by local ordinances and regulations.

Lifting and weight-related precautions

DANGER
Use safe lifting practices when moving the product.

DANGER
Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

DANGER
Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

CAUTION
Do not use the port cover tabs to lift the module. They are not designed to support the weight of the module, which can fall and be damaged.

Laser precautions

DANGER
All fiber-optic interfaces use Class 1 lasers.

DANGER
Use only optical transceivers that are qualified by Brocade Communications Systems, Inc. and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 60825 and EN60825. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

Facility requirements

Before installing the device, be sure the following facilities requirements are met.

TABLE 3 Facility requirements

Type	Requirements
Electrical	• Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the switch nameplate • Circuit protected by a circuit breaker and grounded in accordance with local electrical codes Refer to the Technical Specifications at the end of this guide for complete power supply specifications.
Thermal	• A minimum airflow of 54.5 cubic meters/hour (32.1 cubic ft/min.) available in the immediate vicinity of the switch NOTE Although this airflow may exceed the airflow maximum listed in the device Technical Specifications, the additional airflow is recommended to pressurize the inlet (cool isle) side of rack installations relative to the exhaust side to minimize recirculation of hot air back to the inlet side.

TABLE 3 Facility requirements (continued)

Type	Requirements
	• Ambient air temperature not exceeding 40°C (104°F) while the switch is operating
Rack (when rack-mounted)	• One rack unit (1U) in a 48.3 cm (19-inch) rack • All equipment in the rack grounded through a reliable branch circuit connection • Additional weight of switch not to exceed the rack's weight limits • Rack secured to ensure stability in case of unexpected movement

Quick installation checklist

This checklist provides a high-level overview of the basic installation process from the planning stage to the point where the device comes online and is ready to be deployed. Completing all the tasks in the suggested order ensures successful installation. Brocade recommends that you print this checklist and take it to the installation site.

Pre-installation tasks

Review all installation requirements ahead of time as part of your site preparation. Careful planning and site preparation ensures seamless installation, especially when installing multiple devices.

TABLE 4 Installation prerequisites

Task	Task details or additional information	Completed
Unpack the device.	Take an inventory of the hardware components included in your shipment. Refer to Shipping carton contents on page 22.	
Gather necessary components and required tools.	Review the time and items required information at the beginning of each chapter to ensure you have gathered all necessary components required for the following installation tasks: • Mounting the Device on page 23. • Installing Transceivers and Cables on page 69.	
Review the safety precautions.	Refer to Safety precautions on page 17. For translation of these messages, refer to Cautions and Danger Notices on page 87 at the end of this guide.	
Plan the installation.	Decide whether you want to install the unit on a flat surface or in a rack. For rack installation, obtain the appropriate rack mount kit. Refer to Mounting options on page 23.	
Review and verify installation requirements.	Verify that the following requirements are met. Refer to Facility requirements on page 19. • Power requirements • Environmental requirements • Clearance for standalone or rack installation	
Gather network configuration parameters.	• IP address: • Subnet mask: • Default gateway: • Domain ID: • Time zone:	

Installation and initial configuration

The initial setup includes mounting the device on a flat surface or in a rack and completing the configuration tasks necessary to bring the device online and verify the operation.

TABLE 5 Installation and basic system configuration

Task	Task details or additional information	Completed
Mount the device.	Choose one of the following mounting options: • Mount the device as a standalone unit. Refer to Standalone installation on page 24. • Mount the device using the slide rack mount kit . Refer to Installing the 1U and 2U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162) on page 29. • Mount the device using the fixed-mount rack kit on four-post racks. Refer to Installing the 1U and 2U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162) on page 29. • Mount the device using the mid-mount kit on two-post racks. Refer to Installing the 1U, 1.5U, and 2U Mid-Mount Kit for Two-Post Racks (XBR-000165, XBR-000175, and XBR-R000292) on page 24 • Mount the device using the non-port side fixed-mount rack kit (15"-20") on four-post racks. Refer toInstalling the 1U and 2U Non-Port Side Fixed-Mount Rack Kit (15"-20") for Four-Post Racks (XNA-000072 and XNA-100072) on page 53.	
Gather all components required for the initial setup.	Refer to Items required on page 61.	
Provide power to the device.	Refer to Providing power to the device on page 61.	
Attach a management station, establish a serial connection, and change the default passwords (optional).	Refer to Establishing a first-time serial connection on page 61. After completing this task, log in to the serial port to configure the device.	
Set the IP address, subnet mask, and the default gateway IP address.	Use the **ipaddrset** command to configure a static device IP address, subnet mask, and gateway IP address, or you can use a DHCP server to obtain the information dynamically. Refer to Configuring the IP address on page 62.	
Set the date and time.	• Use the **date** command to display and set the date and time. • Use the **tstimezone** command to display and set the time zone. • Use the **tsclockserver** command to synchronize the time with an external NTP server. Refer to Setting the date and time on page 63 for more information.	
Customize the switch name and chassis name.	• Use the **switchname** command to change the default switch name. • Use the **chassisname** command to change the default chassis name. Refer to Customizing the chassis name and switch name on page 65 for more information.	
Establish an Ethernet connection.	By establishing an Ethernet connection, you can complete the device configuration using a serial session, Telnet, or management application, such as Brocade Network Advisor. Refer to Establishing an Ethernet connection on page 65.	
Optional: Configure the DNS service.	Use the **dnsconfig** command to create DNS server entries. Refer to the *Brocade Fabric OS Administration Guide*.	
Optional: Customize the domain ID.	Use the **configure** command to change the domain ID (default ID is 1). Refer to Setting the domain ID on page 66 for more information.	
Verify that the device operates correctly.	• Check the LEDs to verify operation of functional parts. Refer to Verifying correct operation on page 66. • The following commands can be useful to establish an operational baseline for the device. Refer to the *Brocade Fabric OS Command Reference* for more information on these commands. – **chassisshow** – **psshow** – **fanshow** – **sfpshow** – **tempshow** – **historyshow** – **errdump**	

TABLE 5 Installation and basic system configuration (continued)

Task	Task details or additional information	Completed
Back up the configuration.	Use the interactive **configupload** command to back up the configuration. Refer to Backing up the configuration on page 67 for more information.	
Optional: Power off the devices.	Enter the **shutdown** command and wait for the device to power down, and then unplug the power cord. Refer to Powering down the device on page 68 for more information.	

Shipping carton contents

When unpacking the device, verify that the contents of the shipping carton is complete. Save the shipping carton and packaging in the event you need to return the shipment.

- The Brocade G610 device
- An accessory kit containing the following items:
  - A serial cable
  - One 6-ft. power cord
  - Power cord retainer clip
  - China-RoHS Hazardous/Toxic Substance statement
  - Network Advisor web pointer card.
  - EZSwitch web pointer card
  - Brocade documentation web pointer card

Mounting the Device

Mounting options

You can install the device in several ways:

- As a standalone unit on a flat surface, for example, a table top. No other equipment is required for desktop installation.
- In an EIA rack using the 1U Slide Rack Mount Kit (XBR-R000070). Round-hole and square-hole rack posts are supported. The optional slide-rail rack mount kit can be ordered from your switch retailer.
- In an EIA rack using the 1U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162). The optional fixed-mount rack kit can be ordered from your switch retailer.
- In an EIA rack using the 1U Mid-Mount Kit for Two-Post Racks (XBR-000165). The optional mid-mount rack kit can be ordered from your switch retailer.
- In an EIA rack using the 1U Non-Port Side Fixed-Mount Rack Kit (15"-20") for Four-Post Racks (XNA-000072). The optional nonport-side fixed-mount rack kit can be ordered from your switch retailer.

NOTE
Review the Safety Precautions before mounting the device.

Precautions specific to mounting

The following precautions specifically apply to mounting the device.

DANGER
Use safe lifting practices when moving the product.

DANGER
Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

CAUTION
Make sure the airflow around the front, and back of the device is not restricted.

CAUTION
Never leave tools inside the chassis.

CAUTION
Do not use the port cover tabs to lift the module. They are not designed to support the weight of the module, which can fall and be damaged.

Standalone installation

Complete the following steps to install the device as a standalone unit on a table.

1. Unpack the device and verify the items listed under the Shipping carton contents on page 22 are present and undamaged.
2. Place the device on a sturdy flat surface.
3. Provide power to the device as described in Providing power to the device on page 61.

NOTE
Do not connect the device to the network until the IP address is set correctly. For instructions on how to set the IP address, refer to Configuring the IP address on page 62.

Installing the 1U, 1.5U, and 2U Mid-Mount Kit for Two-Post Racks (XBR-000165, XBR-000175, and XBR-R000292)

Use the following instructions to install a fixed-port device in a mid-mount configuration in a two-post rack using the 1U, 1.5U, and 2U Mid-Mount Kit for Two-Post Racks (XBR-000165, XBR-000175, and XBR-R000292).

Observe the following when mounting this device:

- Two people are required to install the device in a rack. One person holds the device, while the other secures the device to the rack.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Time and items required

Allow 15 to 30 minutes to complete the installation procedure.

The following items are required to install a device using the 1U, 1.5U, or 2U Mid-Mount Kit for Two-Post Racks (XBR-000165, XBR-000175, and XBR-R000292).

- #2 Phillips torque screwdriver
- 1/4 inch slotted-blade torque screwdriver

NOTE
You may need two people to install the device, one to support the device, while the other secures it into the rack.

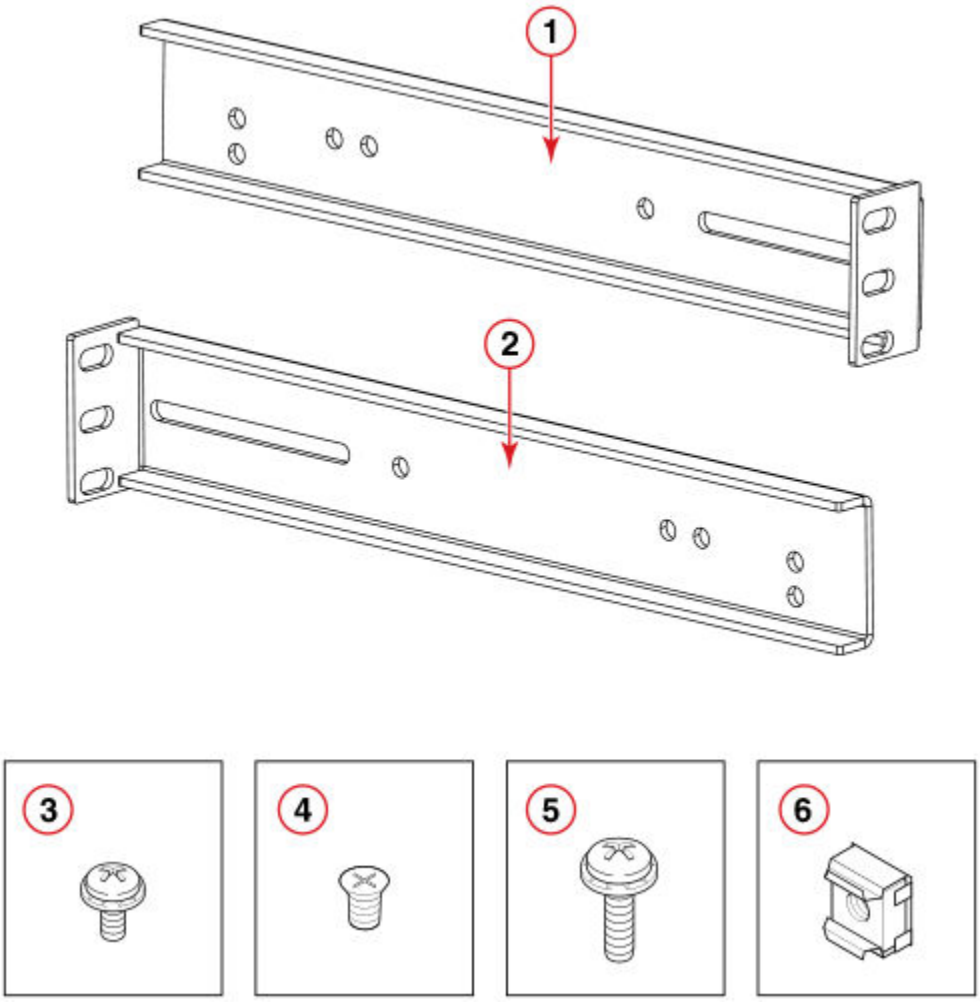
CAUTION
Use the screws specified in the procedure. Using longer screws can damage the device.

Parts list

The following parts are provided with the 1U, 1.5U, or 2U Mid-Mount Rack Kit for Two-Post Racks (XBR-000165, XBR-000175, and XBR-R000292).

NOTE
Depending on the device type, not all parts may be used in an installation.

FIGURE 3 Rack kit parts



1. Bracket, front right and back left
2. Bracket, front left and back right
3. Screw, 8-32 x 5/16-in., panhead Phillips (12)
4. Screw, 6-32 x 1/4-in., flathead Phillips (8)
5. Screw, 10-32 x 5/8-in., panhead Phillips (8)
6. Retainer nut, 10-32 (8)

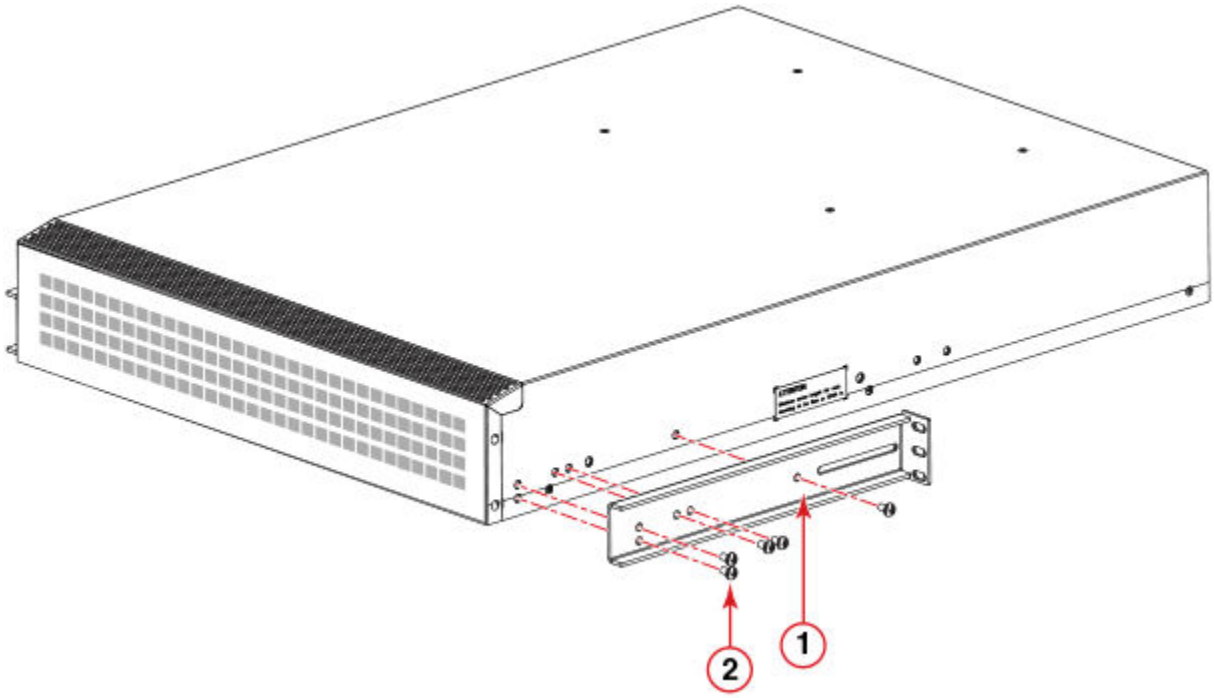
Attaching the front brackets to the device

CAUTION
The device must be turned off and disconnected from the fabric during this procedure.

Complete the following steps to attach the front brackets to the device.

1. Position the right front bracket with the flat side against the right side of the device as shown in the following figure.
2. Insert two 8-32 x 5/16-in. screws into one of the pairs of vertically aligned holes in the bracket and then into the vertical pair of holes on the side of the device. To install the device in a recessed position in the rack, use the bracket holes that are set back from the end of the bracket.
3. Insert 8-32 x 5/16-in. screws through the rest of the holes in the bracket and into the corresponding holes in the device.
4. Repeat step 1 through step 3 to attach the left front bracket to the left side of the device.
5. Tighten all of the 8-32 x 5/16-in. screws to a torque of 15 in-lbs (17 cm-kgs).

FIGURE 4 Attaching the front brackets



1. Bracket, front right
2. Screw, 8-32 x 5/16-in., panhead Phillips

NOTE

Install the device with the airflow aligned with any other devices in the rack. Some devices have airflow running from port side to fan side and others have the opposite arrangement. Make sure that the airflow for all devices moves in the same direction to maximize cooling. Refer to the Hardware Installation Guide for your product for specific requirements.

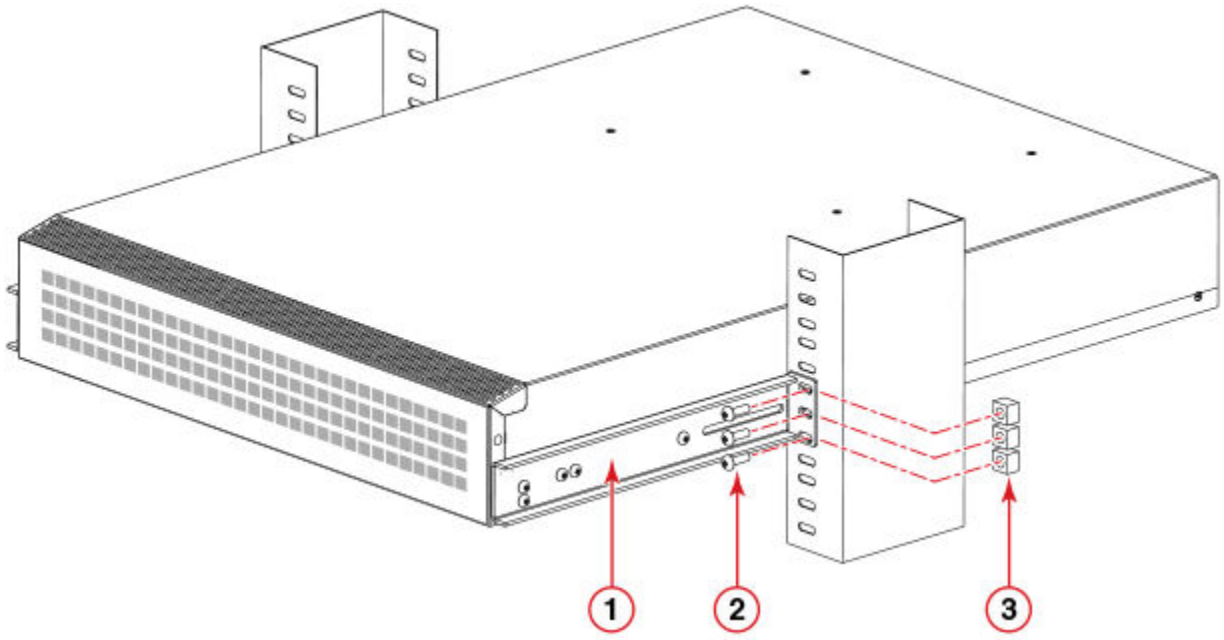
Attaching the device to a rack

Complete the following steps to install the device in the rack.

1. Position the device in the rack as shown in the following figure, providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right rack rail using three 10-32 x 5/8-in. screws and three 10-32 retainer nuts.

3. Attach the left front bracket to the left rack rail using three 10-32 x 5/8-in. screws and three 10-32 retainer nuts.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lbs (29 cm-kgs)

FIGURE 5 Attaching the device to a rack



1. Bracket, front right
2. Screw, 10-32 x 5/8-in., panhead Phillips
3. Retainer nut, 10-32

Attaching the rear brackets to the rack

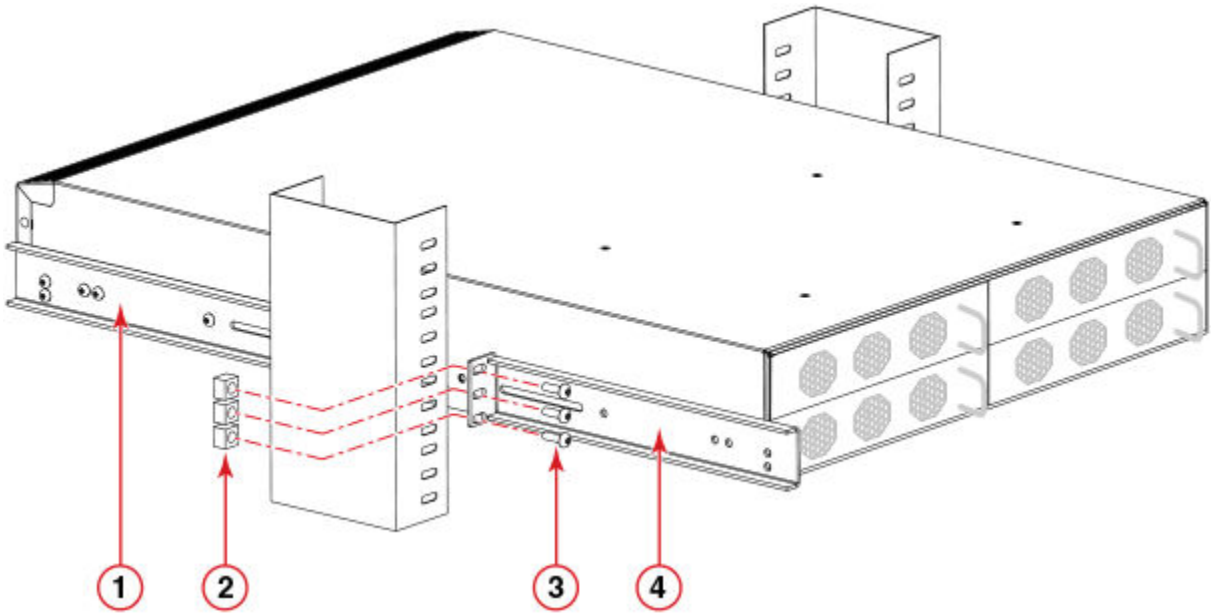
NOTE
Do not use the rear brackets for the Brocade 6505, 6510, or 6520 switches.

Complete the following steps to attach the rear brackets to the rack.

1. Position the right rear bracket in the right rear of the device as shown in the following figure.
2. Attach the brackets using three 10-32 x 5/8-in. screws and 10-32 retainer nuts.
3. Repeat step 1 and step 2 to attach the left rear bracket.

4. Adjust the brackets to the rack depth and tighten the screws to a torque of 25 in-lbs (29 cm-kgs).

FIGURE 6 Attaching the rear brackets to a rack



1. Bracket, front right
2. Retainer nut, 10-32
3. Screw, 10-32 x 5/8-in., flathead Phillips
4. Bracket, rear right

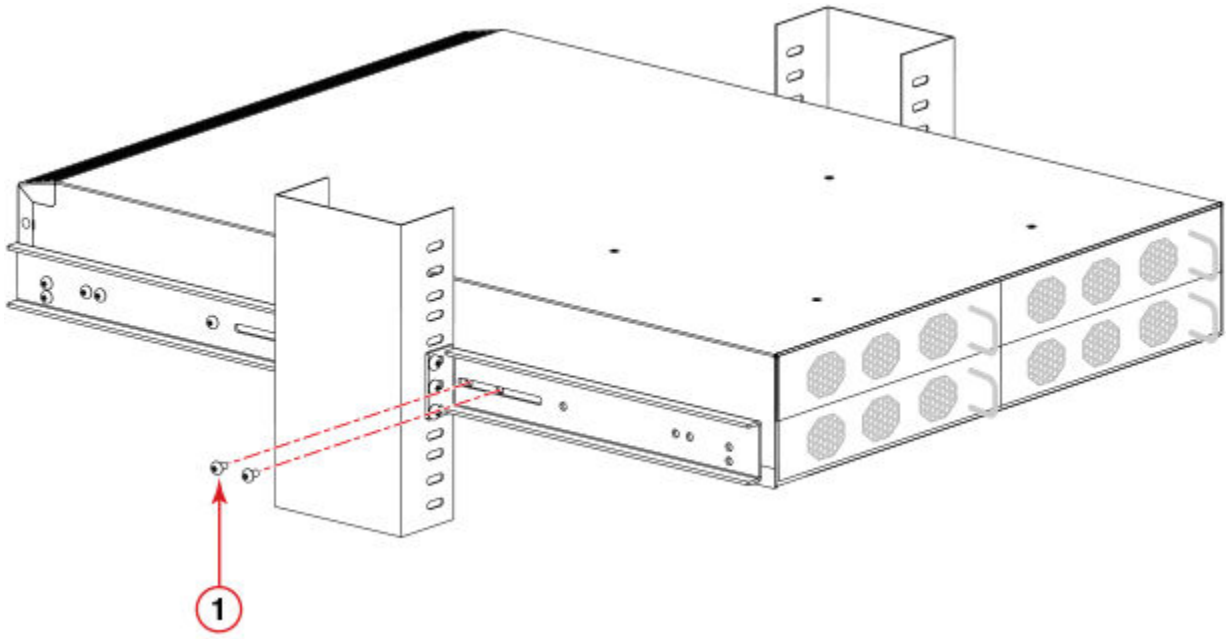
Attaching the rear brackets to the device

Complete the following steps to attach the rear brackets to the device.

1. Align the right rear bracket to the right rear of the device and use two 8-32 x 5/16-in. screws to attach the bracket to the device as shown in the following figure.
2. Align the left rear bracket to the left rear of the device and use two 8-32 x 5/16-in. screws to attach the bracket to the device as shown in the following figure.

3. Tighten all the screws to a torque of 9 in-lbs (10 cm-kgs).

FIGURE 7 Attaching the rear brackets to the device



1. Screw, 8-32 x 5/16-in., panhead Phillips

Installing the 1U and 2U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162)

Use the following instructions to install a fixed-port device in a fixed-mount configuration using the 1U and 2U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162).

Observe the following when mounting this device:

- Two people are required to install the device in a rack. One person holds the device, while the other secures the device to the rack.
- Use Electronic Industries Association (EIA) standard racks.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Time and items required

Allow 15 to 30 minutes to complete the installation procedure.

The following items are required to install a device using the 1U and 2U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162).

- #2 Phillips torque screwdriver
- 1/4-inch slotted-blade torque screwdriver

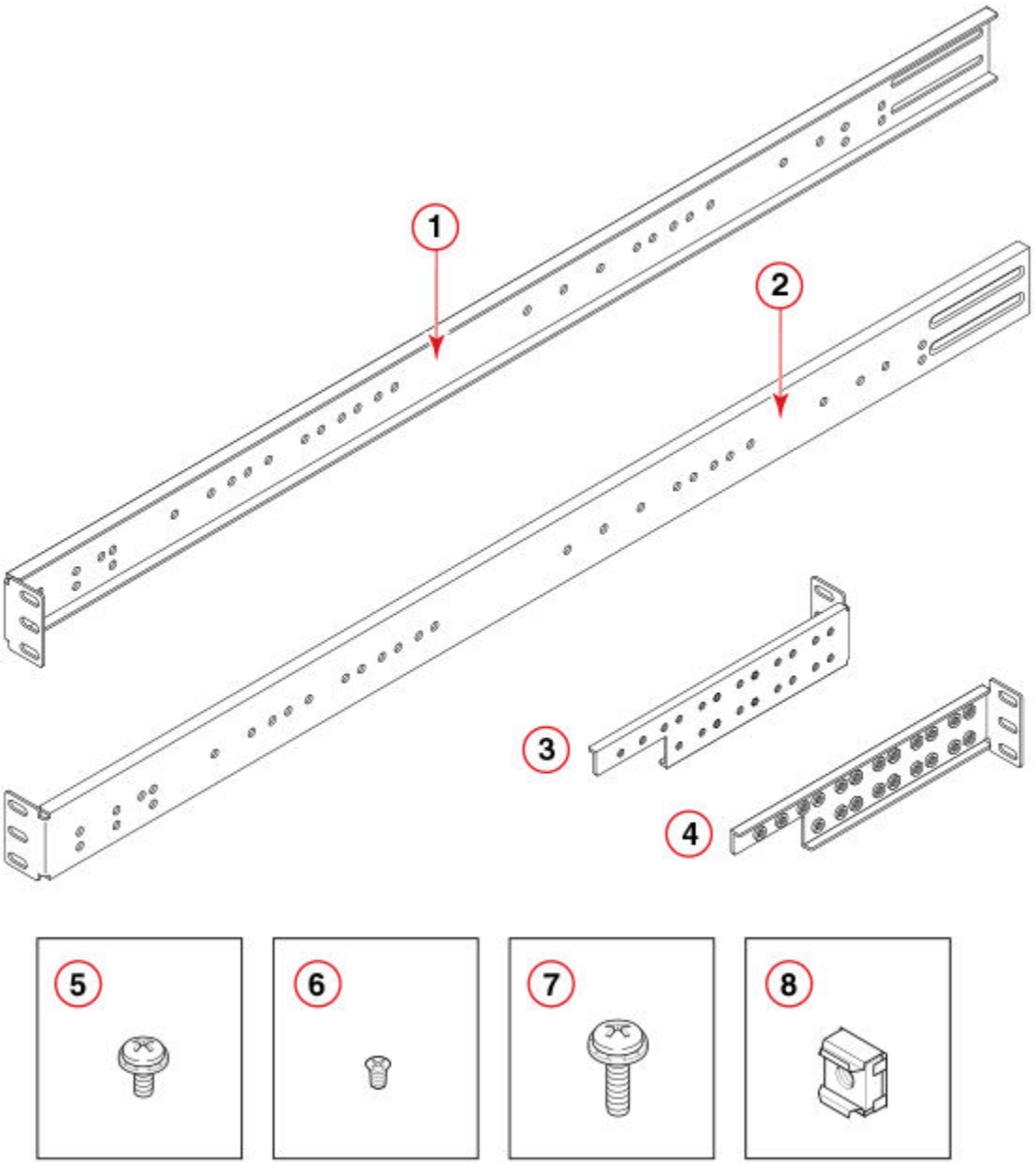
NOTE
You may need two people to install the device, one to support the device, while the other secures it into the rack.

CAUTION
Use the screws specified in the procedure. Using longer screws can damage the device.

Parts list

The following parts are provided with the 1U and 2U Fixed-Mount Rack Kit for Four-Post Racks (XBR-R000162).

FIGURE 8 Rack kit parts



1. Bracket, front right
2. Bracket, front left
3. Bracket, rear left
4. Bracket, rear right
5. Screw, 8-32 x 5/16-in., panhead Phillips (12)
6. Screw, 6-32 x 1/4-in., flathead Phillips (8)
7. Screw, 10-32 x 5/8-in., panhead Phillips (8)
8. Retainer nut, 10-32 (8)

NOTE

Not all parts may be used with certain installations depending on the device type.

NOTE

Although this document describes how to install single-height (1U) and double-height (2U) devices, the illustrations show a single-height device as a typical installation.

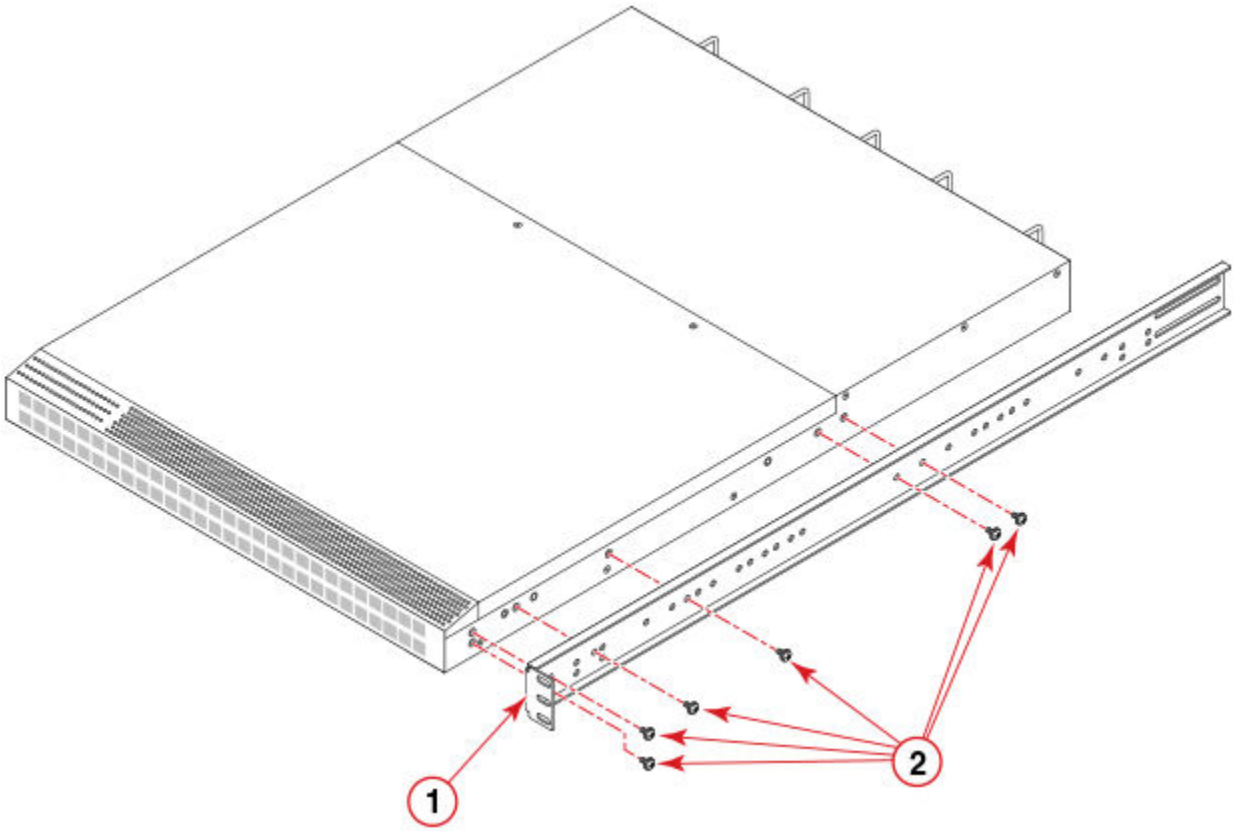
Attaching the front brackets

CAUTION
The device must be turned off and disconnected from the fabric during this procedure.

Complete the following steps to attach the front brackets to the device.

1. Position the right front bracket with the flat side against the right side of the device, as shown in the following figure.
2. Insert two 8-32 x 5/16-in. screws into one of the pairs of vertically aligned holes in the bracket and then into the pair of holes on the side of the device. To install the device in a recessed position in the rack, use the bracket holes that are set back from the end of the bracket.
3. Insert additional 8-32 x 5/16-in. screws through the holes in the bracket and into the corresponding holes in the device. The number of screws may vary depending on the device model.
4. Repeat step 1 through step 3 to attach the left front bracket to the left side of the device.
5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lbs (17 cm-kgs).

FIGURE 9 Attaching the front brackets



1. Bracket, front right
2. Screw, 8-32 x 5/16-in., panhead Phillips

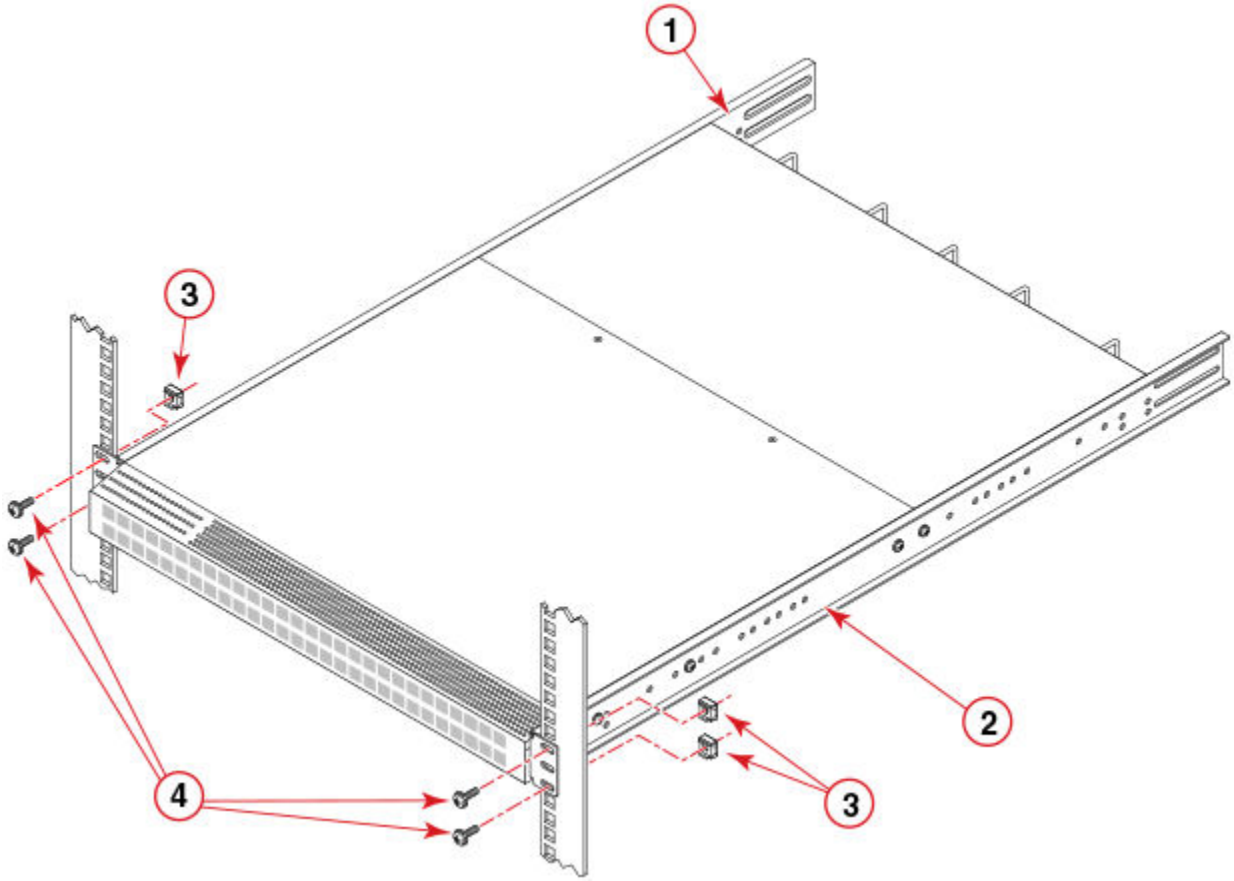
Installing the device in the rack

Complete the following steps to install the device in the rack.

1. Position the device in the rack, as shown in the following figure, providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts.
3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. screws and two retainer nuts.

4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lbs (29 cm-kgs)

FIGURE 10 Positioning the device in the rack



1. Bracket, front left
2. Bracket, front right
3. Retainer nut, 10-32
4. Screw, 10-32 x 5/8-in., panhead Phillips

NOTE
The figure above is shown with a recessed mounting configuration on the left and a flush mounting configuration on the right. You can select either mounting option.

NOTE
Install the device with the airflow aligned with any other devices in the rack. Some devices have airflow running from port side to fan side and others have the opposite arrangement. Make sure that the airflow for all devices moves in the same direction to maximize cooling. Refer to the Hardware Installation Guide for your product for specific requirements.

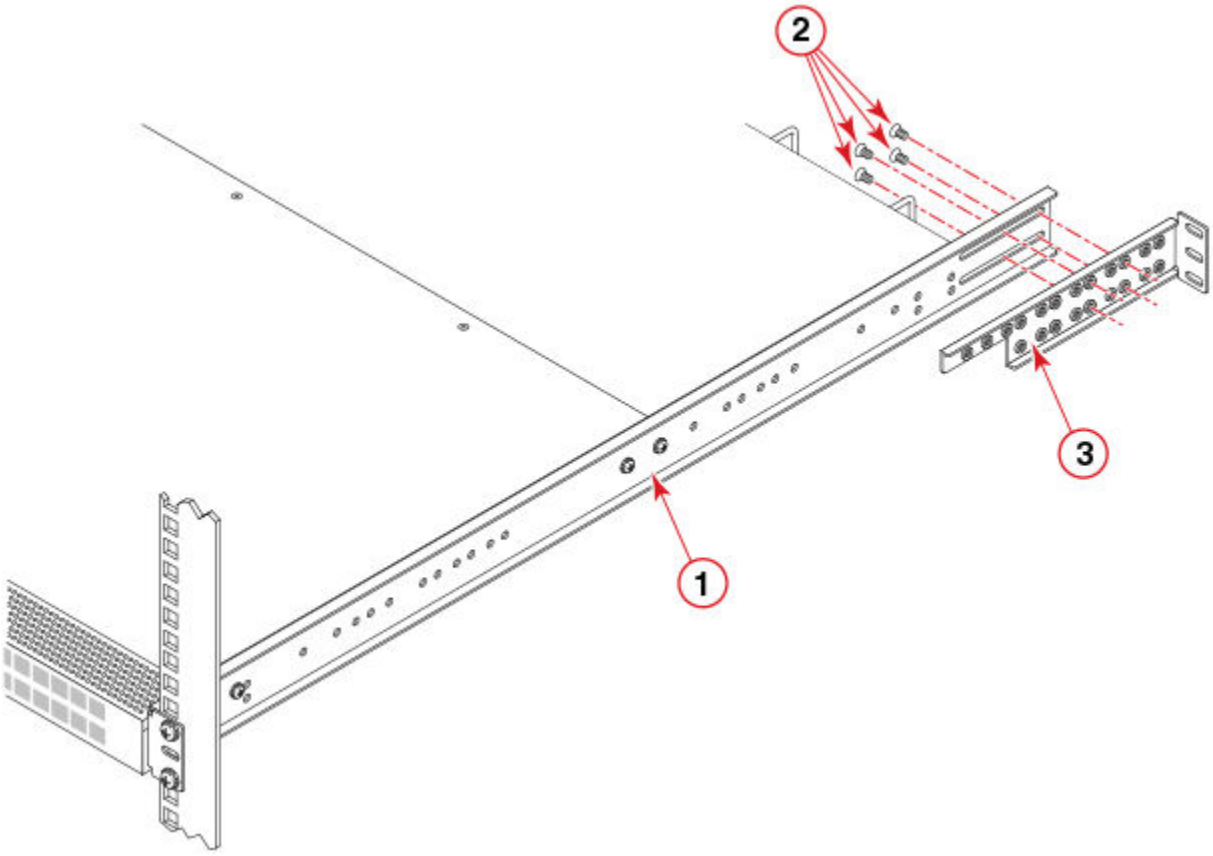
Attaching the rear brackets to the front brackets

Complete the following steps to attach the rear brackets to the front brackets.

1. Position the right rear bracket inside the right front bracket, as shown in the following figure.
2. Attach the brackets using four 6-32 x 1/4-in. screws.

3. Repeat step 1 and step 2 to attach the left rear bracket to the left front bracket.
4. Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lbs (10 cm-kgs).

FIGURE 11 Attaching the rear brackets to the front brackets



1. Bracket, front right
2. Screw, 6-32 x 1/4-in., flathead Phillips
3. Bracket, rear right

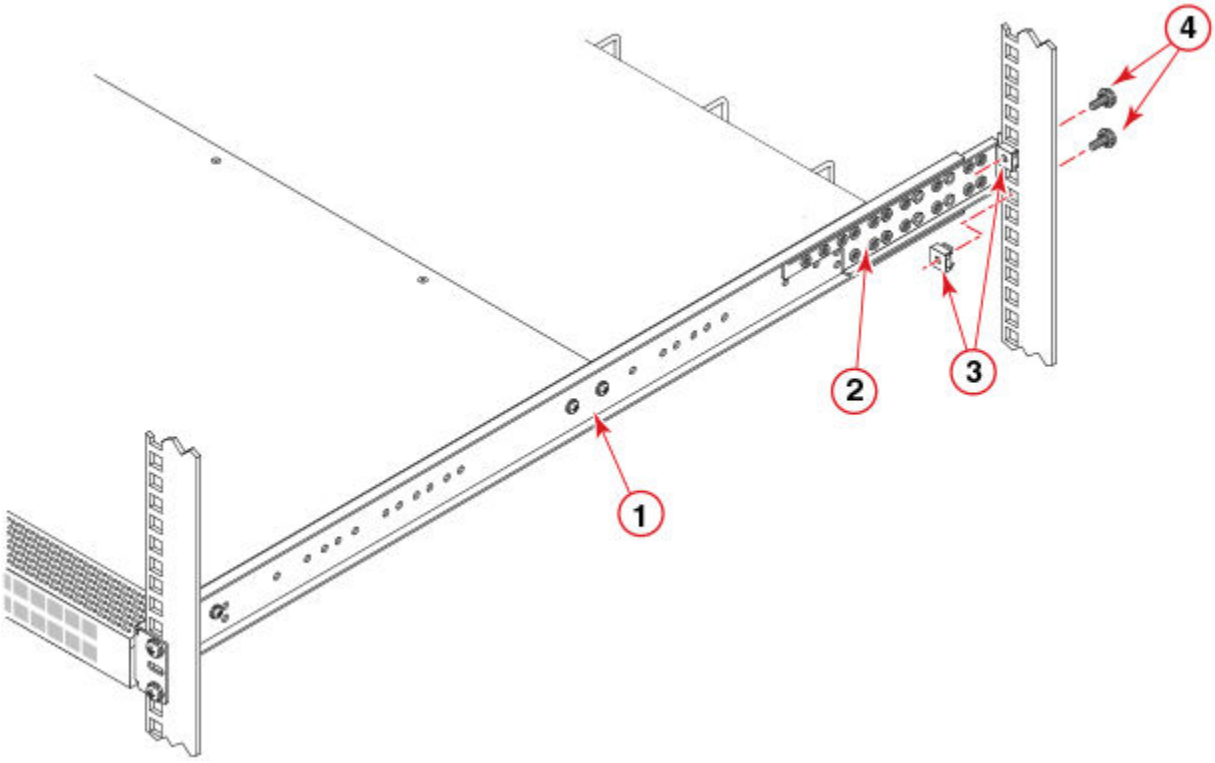
Attaching the rear brackets to the rack posts

Complete the following steps to attach the rear brackets to the rack posts.

1. Attach the right rear bracket to the right rear rack post using two 10-32 x 5/8-in. screws and two retainer nuts, as shown in the following figure.
2. Attach the left rear bracket to the left rear rack post using two 10-32 x 5/8-in. screws and two retainer nuts.

3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lbs (29 cm-kgs).

FIGURE 12 Attaching the rear bracket to the rack post



1. Bracket, front right
2. Bracket, rear right
3. Retainer nut, 10-32
4. Screw, 10-32 x 5/8-in., panhead Phillips

Slide Rack Mount Kit (XBR-R000070)

Use the following instructions to install a 1U or 2U device in a 19-in. (48.3 cm) EIA rack using the Slide Rack Mount Kit. Round-hole and square-hole rack posts are supported.

Observe the following when mounting this device:

- The device can be installed so that the port side is either flush with the front posts or recessed from the front posts. A recessed position allows a more gradual bend in the fiber optic cables connected to the device.
- Use Electronic Industries Association (EIA) standard racks. Provide space in a 19-in. (48.3 cm) EIA rack, as required for the device type, with a minimum distance of 28.25 in. (71.76 cm) and a maximum distance of 29.88 in. (75.90 cm) between the front and back posts.
- Two people are required to install the device in a rack. One person holds the device, while the other secures the device to the rack.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Safety precautions

DANGER
Use safe lifting practices when moving the product.

DANGER
Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.

CAUTION
Make sure the airflow around the front, and back of the device is not restricted.

CAUTION
Use the screws specified in the procedure. Using longer screws can damage the device.

CAUTION
Never leave tools inside the chassis.

CAUTION
Do not use the port cover tabs to lift the module. They are not designed to support the weight of the module, which can fall and be damaged.

CAUTION
To prevent damage to the chassis and components, never attempt to lift the chassis using the fan or power supply handles. These handles were not designed to support the weight of the chassis.

Time and items required

Allow 15 to 30 minutes to complete this procedure.

The following tools are required to install a device using the Slide Rack Mount Kit:

- #2 Phillips torque screwdriver
- 11/32-inch wrench
- 1/4-inch slotted-blade torque screwdriver

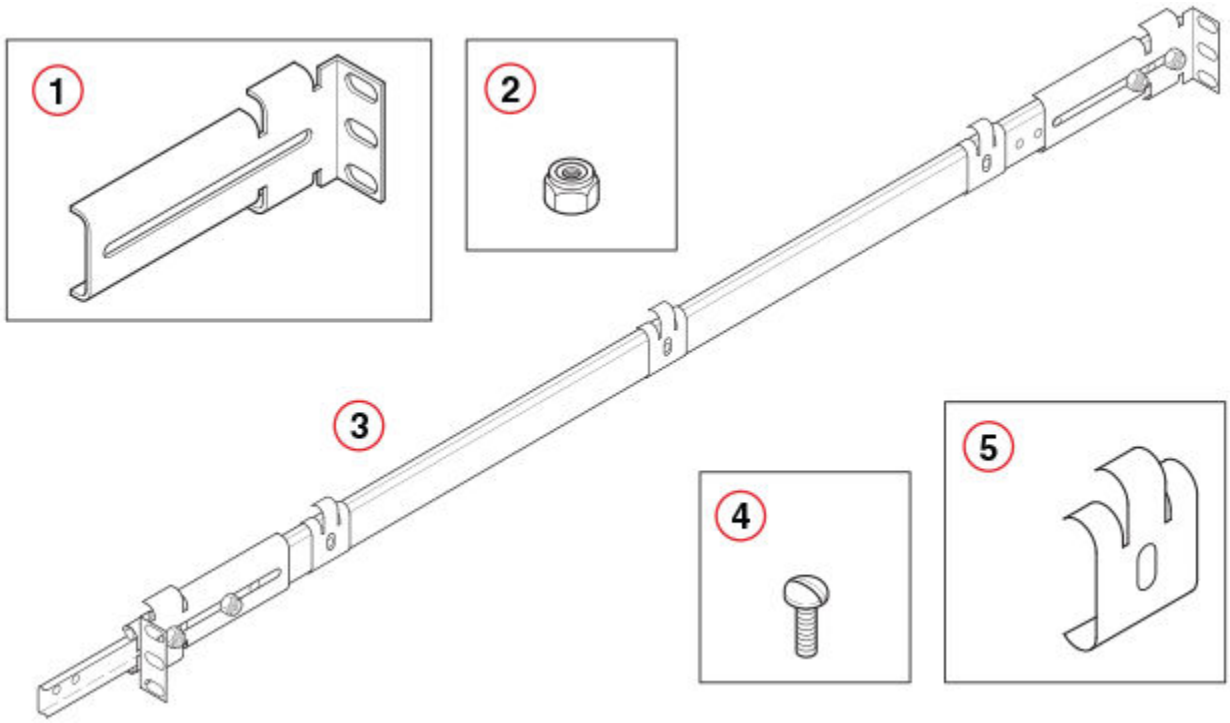
Parts list

The following parts are provided with the 1U and 2U Slide-Mount Rack Kit for Four-Post Racks (XBR-R000070).

NOTE
Use the screws specified for use with the device. Longer screws can damage the device.

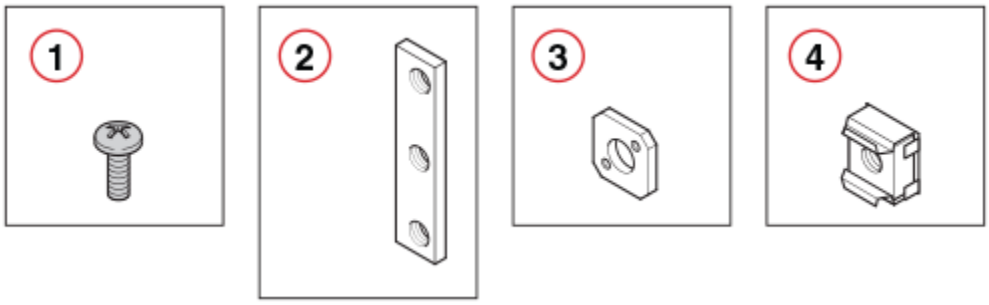
NOTE
Depending on the device type, not all parts may be used in an installation.

FIGURE 13 Rack kit parts (1 of 4)



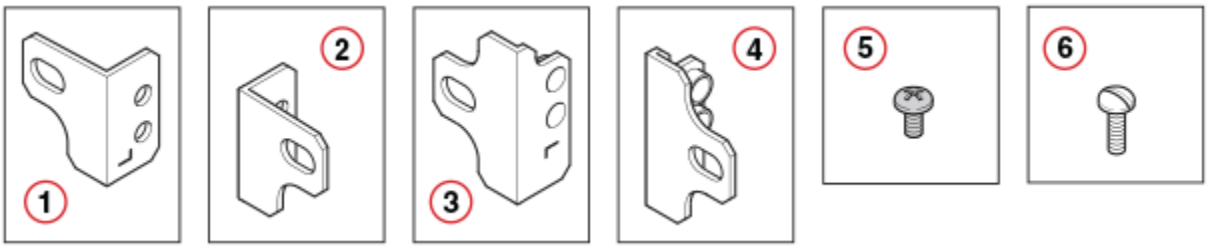
1. Three-hole slide mount L-bracket (4)
2. Locking hex nut, 8-32 (8)
3. Slide assembly, containing one inner and one outer slide rail, with Items 2, 3, 4, and 5 installed on the outer slide rail (each slide assembly is bagged separately) (2)
4. Slotted screw, 8-32 x 3/8 in., zinc (8)
5. Power cord clip (6)

FIGURE 14 Rack kit parts(2 of 4)



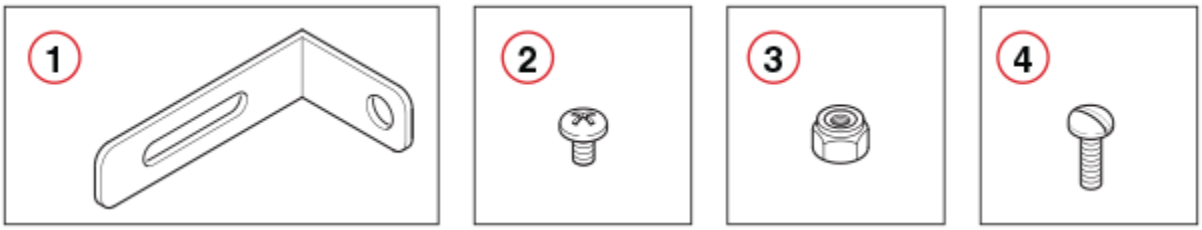
1. Phillips screw, 10-32 x 1/2 in., black (12)
2. Three-hole rack nut bar, 8-32 (4)
3. Alignment washer (12)
4. Retainer nut, 10-32 (12)

FIGURE 15 Rack kit parts (3 of 4)



1. Left rack mount bracket (unexpected movement safety bracket for port side) (1)
2. Right rack mount bracket (unexpected movement safety bracket for port side) (1)
3. Alternate left mount bracket (unexpected movement safety bracket for port side) (1)
4. Alternate right mount bracket (unexpected movement safety bracket for port side) (1)
5. Phillips screw, 8-32 x 1/4 in., black (4)
6. Slotted screw, 8-32 x 3/8 in., zinc (4)

FIGURE 16 Rack kit parts (4 of 4)



1. Back rack mount bracket (unexpected movement safety bracket for non-port side) (2)
2. Phillips screw, 8-32 x 3/16 in., zinc (12)
3. Locking hex nut, 8-32 (4)
4. Slotted screw, 8-32 x 3/8 in., zinc (4)

Installing the device

NOTE
The device must be turned off and disconnected from the fabric during this procedure.

NOTE
Two people are required to install the device in a rack. One person can hold the device while the other attaches it to the rack.

NOTE
Although this document describes how to install 1U, 1.5U, or 2U devices, the illustrations show a 1.5U device.

Complete the following tasks to install the device in a rack.

Preparing the slide assemblies

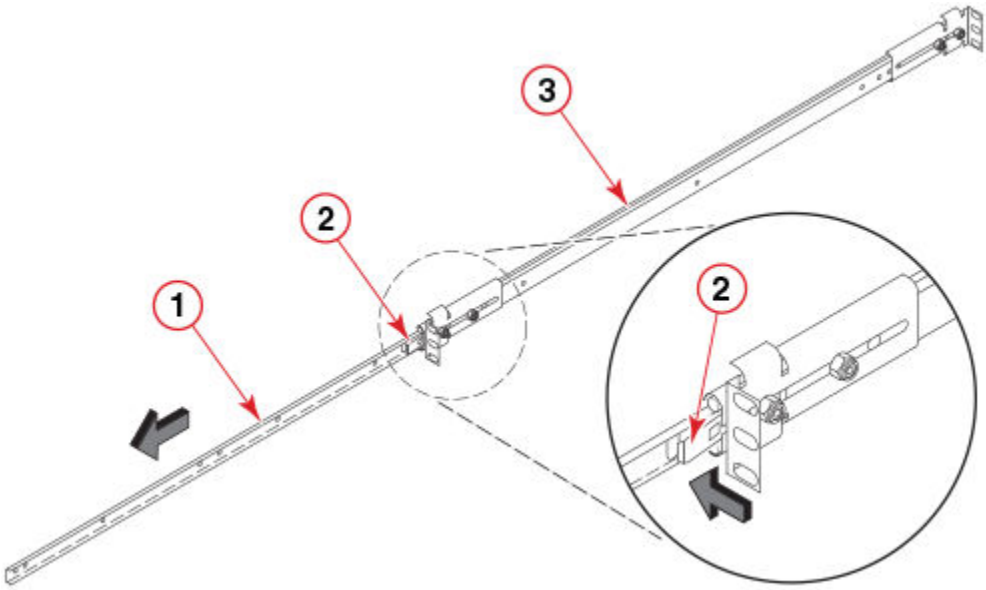
Perform the following steps to prepare both slide assemblies for installation.

1. Locate the slide assembly in the kit, as shown in the following figure. The slide assembly comes fully assembled and includes all of the parts shown in the figure.
2. Pull the inner slide rail out until the lock engages. Refer to the following figure.

3. Press the lock-release lever located inside the inner slide rail and pull the inner rail away from the outer rail.
4. Repeat these steps for the second slide assembly.

NOTE
The device must be turned off and disconnected from the fabric during the installation procedure.

FIGURE 17 Pulling the slide rails apart



1. Inner slide rail
2. Lock-release lever
3. Slide assembly

Attaching the inner slide rails to the device

Perform the following steps to attach the inner slide rails to the device.

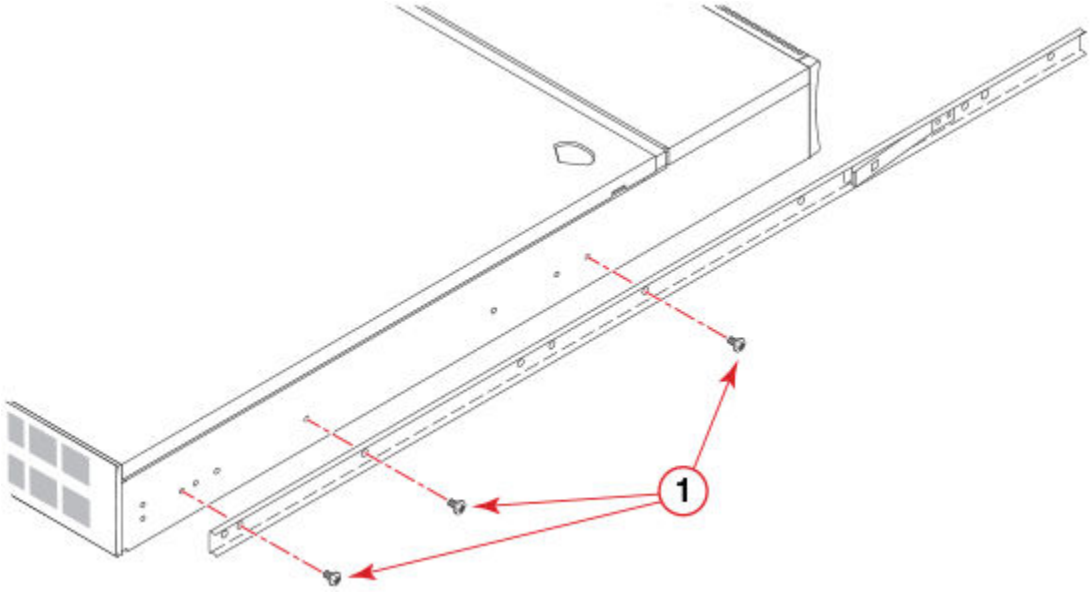
1. Position an inner slide rail with the flat side against the device and the end containing the lock-release lever toward the non-port side of the device.
2. Align the rail holes with the holes drilled in the side of the device, as shown in the following figure.

NOTE
The hole pattern is identical for all 1U, 1.5U, and 2U devices.

3. Attach the rail using three Phillips 8-32 x 3/16-in. screws.
4. Tighten the screws to a torque of 15 in-lbs (17 cm-kgs).

5. Repeat these steps for the inner slide rail on the other side of the device.

FIGURE 18 Installing the inner rail to allow a device to slide out of the port side



1. Phillips screw, 8-32 x 3/16 in., zinc

NOTE
Two people are required to install the device in a rack. One person can hold the device while the other attaches it to the rack.

Attaching the rack mount brackets

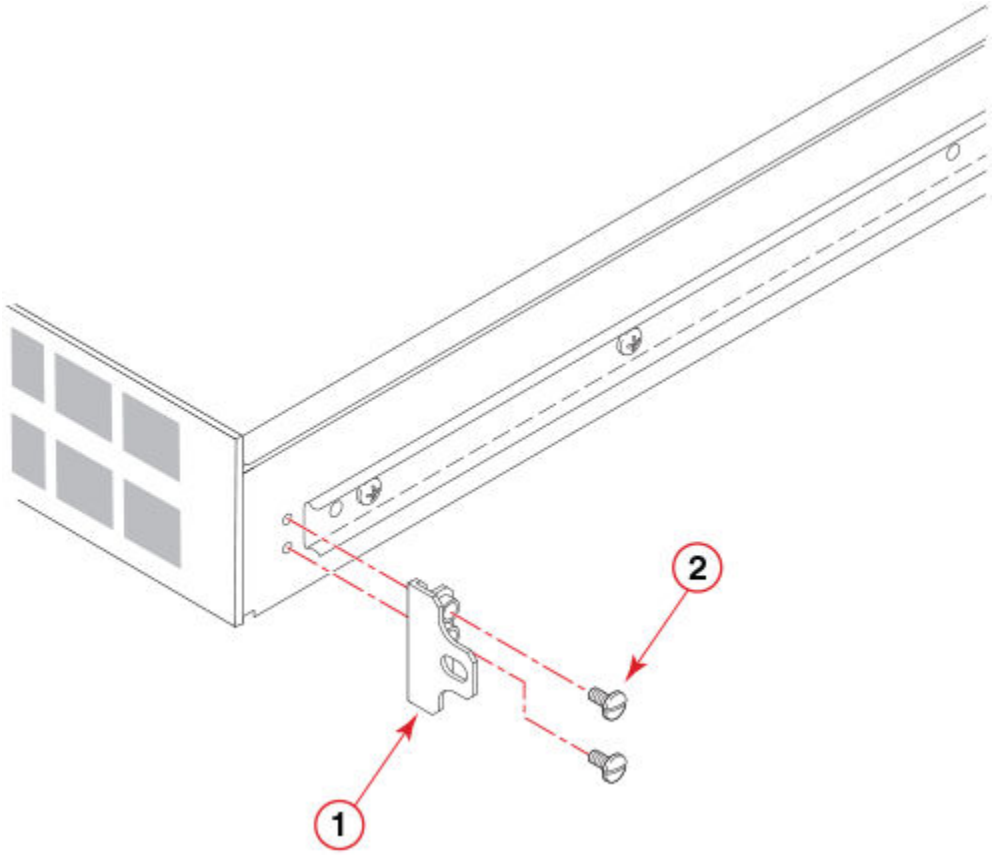
Perform the following steps to attach the rack mount brackets.

1. Position the right rack mount bracket next to the right side of the device, as shown in the following figure.
2. Attach the right rack mount bracket to the device using two slotted-head 8-32 x 3/8 in. screws. You can use either the regular rack mount bracket or the alternate rack mount bracket. Be sure to be consistent on both sides of the device.

   For recessed mounting, you can use the back rack mount brackets on the front instead of the left and right rack mount brackets.
3. Tighten the screws to a torque of 15 in-lbs (17 cm-kgs).

4. Repeat these steps for the left rack mount bracket.

FIGURE 19 Attaching a rack mount bracket



1. Right rack mount bracket (use left rack mount bracket on opposite side)
2. Slotted screw, 8-32 x 3/8 in., zinc

Attaching the L-brackets to the rack posts

Each slide assembly includes two L-brackets that attach to the rack posts (either round-hole or square-hole). The Slide Rack Mount Kit includes hardware compatible with both rack post types.

NOTE
Two methods are available for square-hole rack posts: one using retainer nuts (Method A), and one using alignment washers and three-hole nut bars (Method B).

The following sections provide installation instructions for each type of rack posts.

Repositioning the port side L-bracket

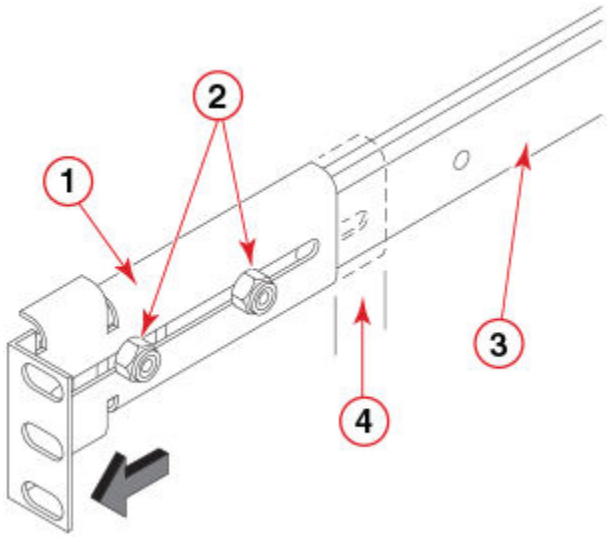
Perform the following steps to reposition the port side L-bracket for correct mounting.

1. On the port side of the outer slide rail, using the 11/32-inch wrench, loosen the nuts securing the L-bracket, as shown in the following figure.

2. Extend the end of the bracket beyond the end of the slide rail by 5/8 inch.

   Repositioning allows the rack mount brackets to align with the rack posts.

FIGURE 20 Repositioning the L-brackets



1. Three-hole slide mount L-bracket
2. Locking hex nut, 8-32
3. Outer slide rail
4. 5/8-inch reposition

Attaching the rail to round-hole rack posts

Perform the following steps to install the round-hole hardware.

1. Position the outer slide rail inside the rack posts with the closed ends of the slide rail toward the non-port side of the rack, as shown in the following figure.
2. Loosen and adjust the position of the non-port side L-bracket as necessary.

   NOTE
   If side rack access is not available, measure the depth of the rack, loosen the L-bracket on the non-port side, and adjust the bracket position until the total rail length matches the rack depth.

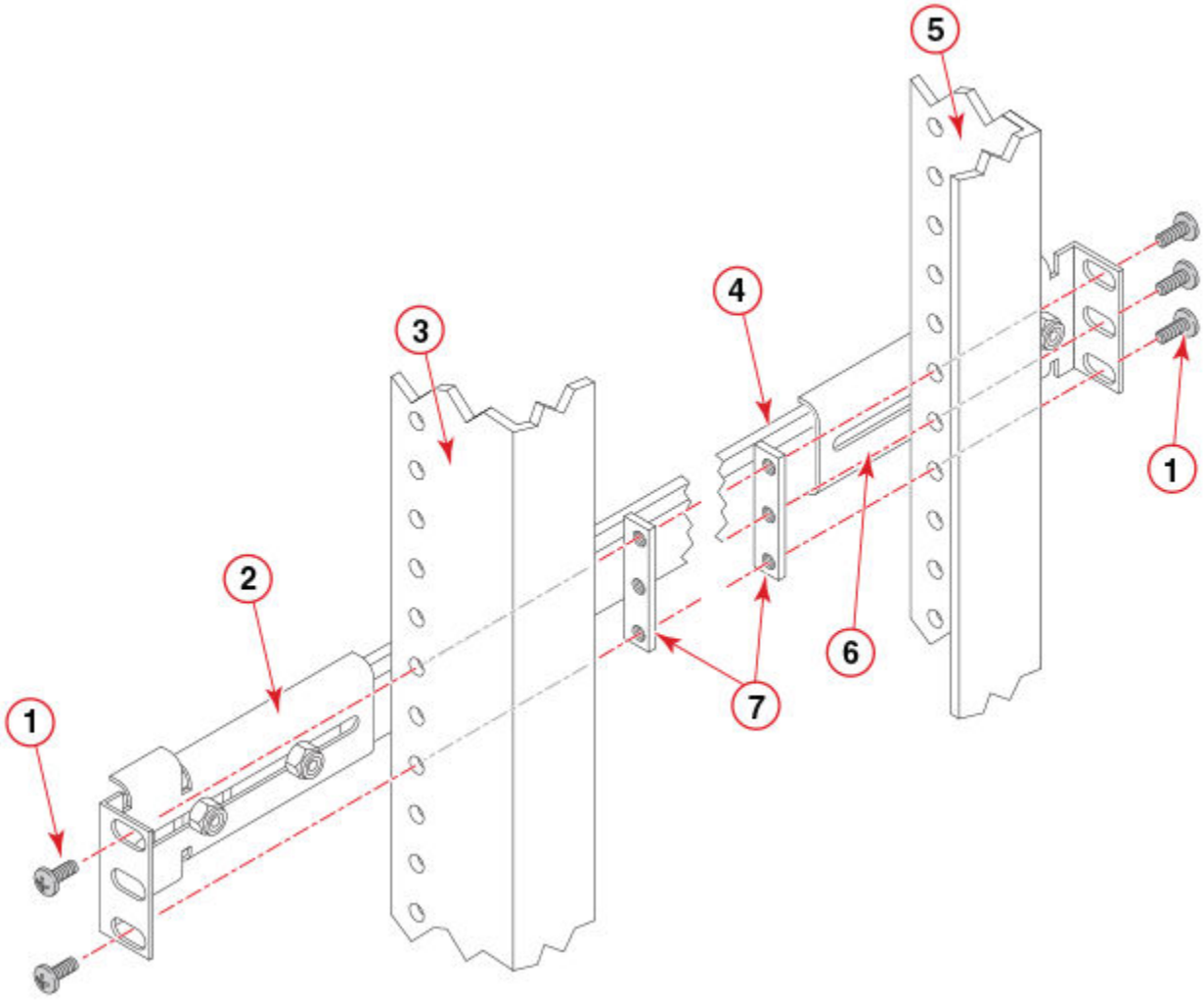
3. Attach the L-brackets to the rack posts using five Phillips 10-32 x 1/2 in. screws and two of the three-hole rack nut bars.

   NOTE
   Leave the middle hole empty on the port side for securing the rack mount bracket later (refer to Inserting the device in the rack on page 48).

4. Tighten the screws to 15 in-lbs (17 cm-kgs).

5. Repeat these steps for the other rail.

FIGURE 21 Attaching outer slide rails to round-hole rack posts



1. Phillips screw, 10-32 x 1/2 in., black (5 each side)
2. Three-hole slide mount L-bracket (2 each side)
3. Rack post (port side)
4. Outer slide rail
5. Rack post (non-port side)
6. Three-hole slide mount L-bracket
7. Three-hole rack nut bar, 8-32 (2 each side)

Attaching the rail to square-hole rack posts (Method A)

Perform the following steps to install the square-hole hardware using Method A.

1. Position the outer slide rail inside the rack posts with the closed ends of the slide rail toward the non-port side of the rack, as shown in the following figure.

2. Loosen and adjust the position of the non-port side L-bracket as necessary.

   NOTE
   If side rack access is not available, measure the depth of the rack, loosen the L-bracket on the non-port side, and adjust the bracket position until the total rail length matches the rack depth.

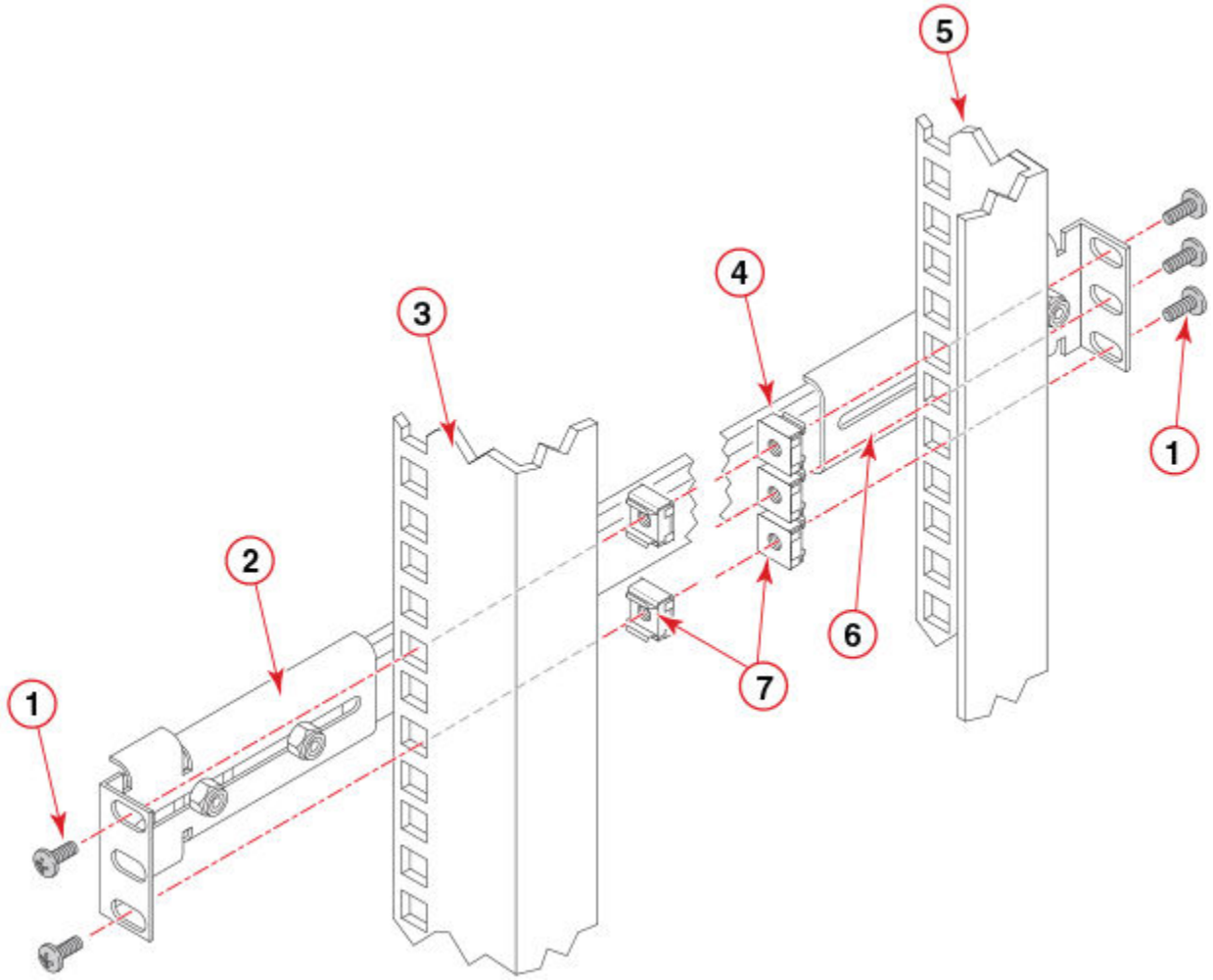
3. Attach the L-brackets to the rack posts using five Phillips 10-32 x 1/2 in. screws and five retainer nuts.

   NOTE
   Leave the middle hole empty on the port side for securing the rack mount bracket later (refer to Inserting the device in the rack on page 48).

4. Tighten the screws to 15 in-lbs (17 cm-kgs).

5. Repeat these steps for the other rail.

FIGURE 22 Method A for attaching outer slide rails to square-hole rack posts



1. Phillips screw, 10-32 x 1/2 in., black (5 each side)
2. Three-hole slide mount L-bracket (2 each side)
3. Rack post (port side)
4. Outer slide rail
5. Rack post (non-port side)
6. Three-hole slide mount L-bracket
7. Retainer nut, 10-32 (5 each side)

Attaching the rail to square-hole rack posts (Method B)

Perform the following steps to install the square-hole hardware using Method B.

1. Position the outer slide rail inside the rack posts with the closed ends of the slide rail toward the non-port side of the rack, as shown in the following figure.

2. Loosen and adjust the position of the non-port side L-bracket as necessary.

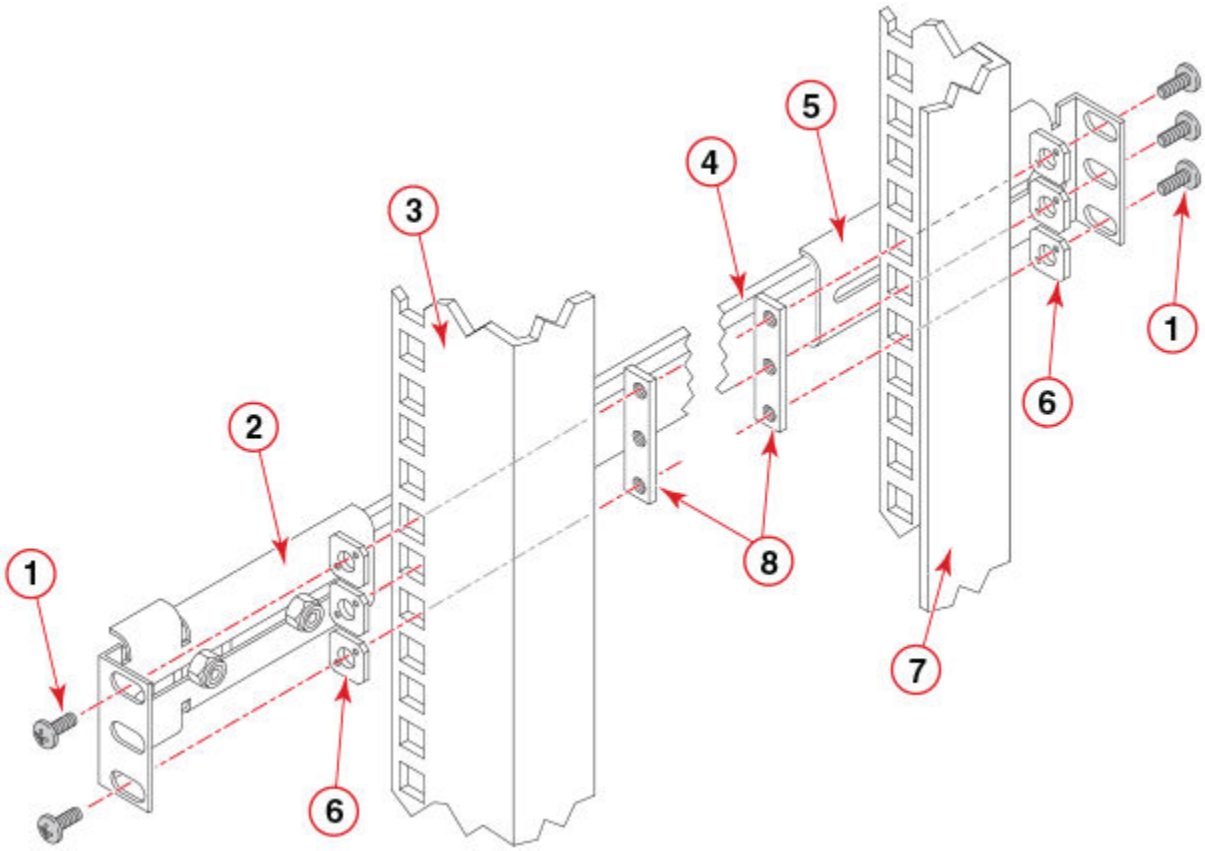
   NOTE
   If side rack access is not available, measure the depth of the rack, loosen the L-bracket on the non-port side, and adjust the bracket position until the total rail length matches the rack depth.

3. Attach the L-brackets to the rack posts using five Phillips 10-32 x 1/2 in. screws, six alignment washers, and two of the three-hole rack nut bars.

   NOTE
   Leave the middle hole empty on the port side for securing the rack mount bracket later (refer to Inserting the device in the rack on page 48); however, position an alignment washer between the L-bracket and the rack post.

4. Tighten the screws to 15 in-lbs (17 cm-kgs).
5. Repeat these steps for the other rail.

FIGURE 23 Method B for attaching outer slide rails to square-hole rack posts



1. Phillips screw, 10-32 x 1/2 in., black (5 each side)
2. Three-hole slide mount L-bracket (2 each side)
3. Rack post (port side)
4. Outer slide rail
5. Three-hole slide mount L-bracket
6. Alignment washer (6 each side)
7. Rack post (non-port side)
8. Three-hole rack nut bar, 8-32 (2 each side)

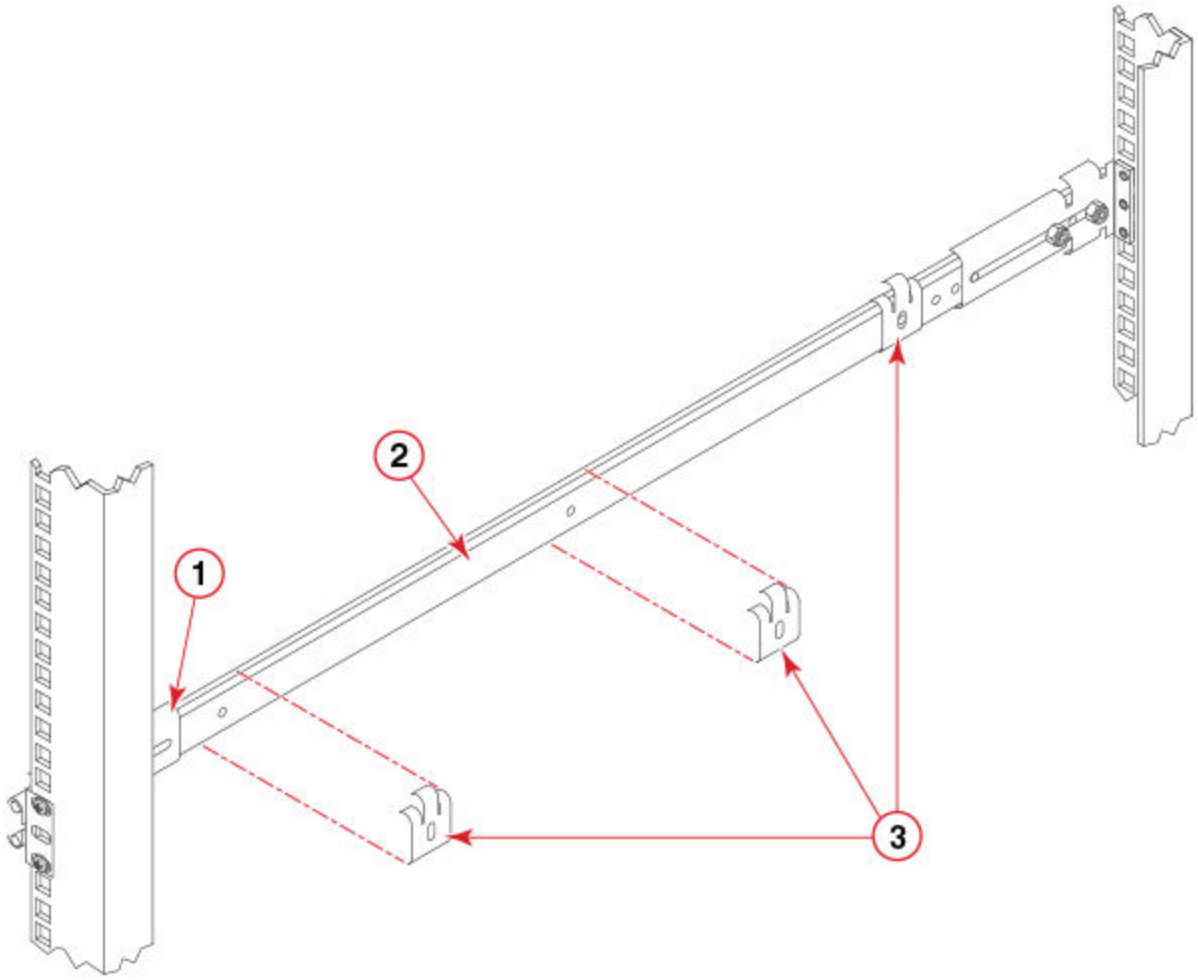
Inserting the device in the rack

Perform the following steps to install the device in the rack.

1. Position the power cord clips on the outer surface of both outer slide rails, as shown in the following figure.

   Ensure that the clips do not interfere with the movement of the rails. Position all the clips either with the tabs above or with the tabs below the rail.

   FIGURE 24 Attaching the power cord clips



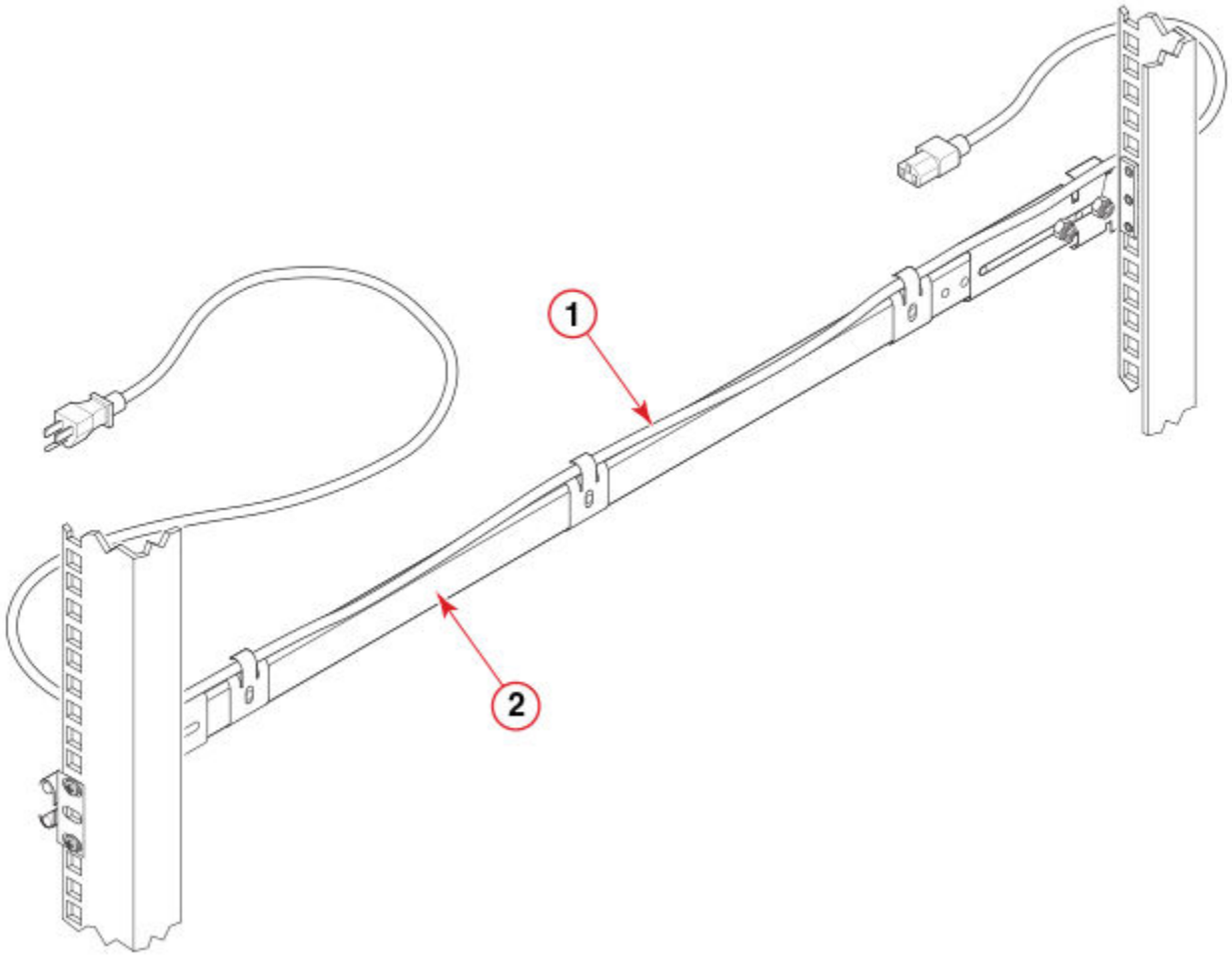
1. Three-hole slide mount L-bracket
2. Slide assembly
3. Power cord clips (3 each side)

2. Insert the power cords into the power cord clips, with the power cord prongs pointing toward the power source, as shown in the following figure.

NOTE
Allow a minimum service loop of six inches at the device to ensure freedom to plug and unplug the power cords. Ensure that the power cords route completely outside of the slide rails.

NOTE
Ensure that the power cords align in the clips and do not fall inside the slide rails. To prevent the cords from being pulled out of the clips, unplug the cords from the device before moving the device on the slide rails.

FIGURE 25 Inserting the power cords in clips



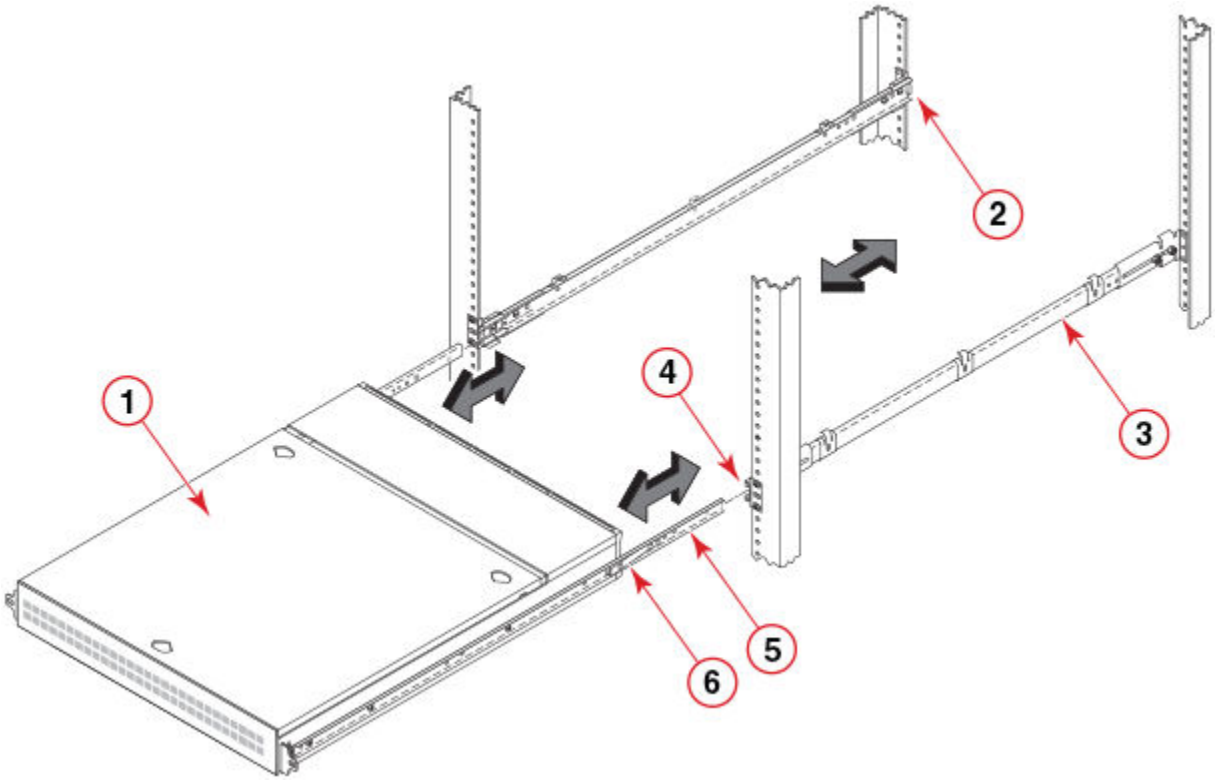
1. Power cord
2. Slide assembly

3. Position the device next to the rack; align and insert the inner rails inside the outer rails, as shown in the following figure.

4. Gently slide the device into the rack. If there is any resistance, pull the device out of the rack and realign the slide rails.

NOTE
Check the rail alignment by sliding the device out and back into the rack.

FIGURE 26 Inserting the device



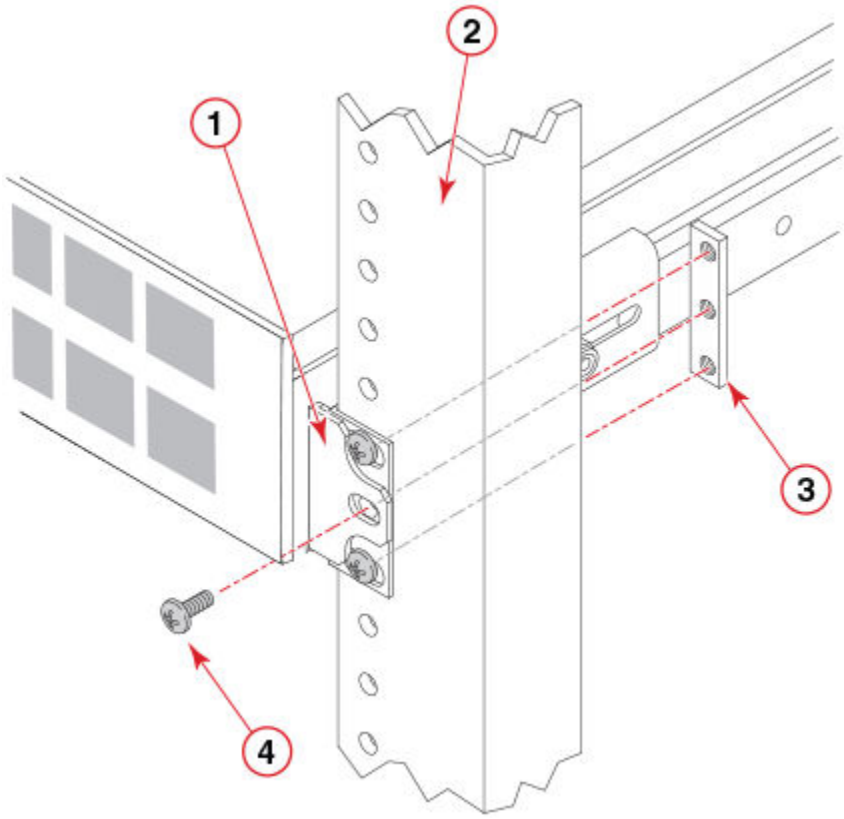
1. device
2. Slide assembly closed end
3. Outer slide rail
4. Slide assembly open end
5. Inner slide rail
6. Lock-release lever

5. Secure the rack mount brackets to the rack posts using one Phillips 10-32 x 1/2 in. screw per bracket and tighten the screws to a torque of 25 in-lbs (29 cm-kgs).

   For square-hole rack post Method A installations, use the remaining retainer nut to secure the screw.

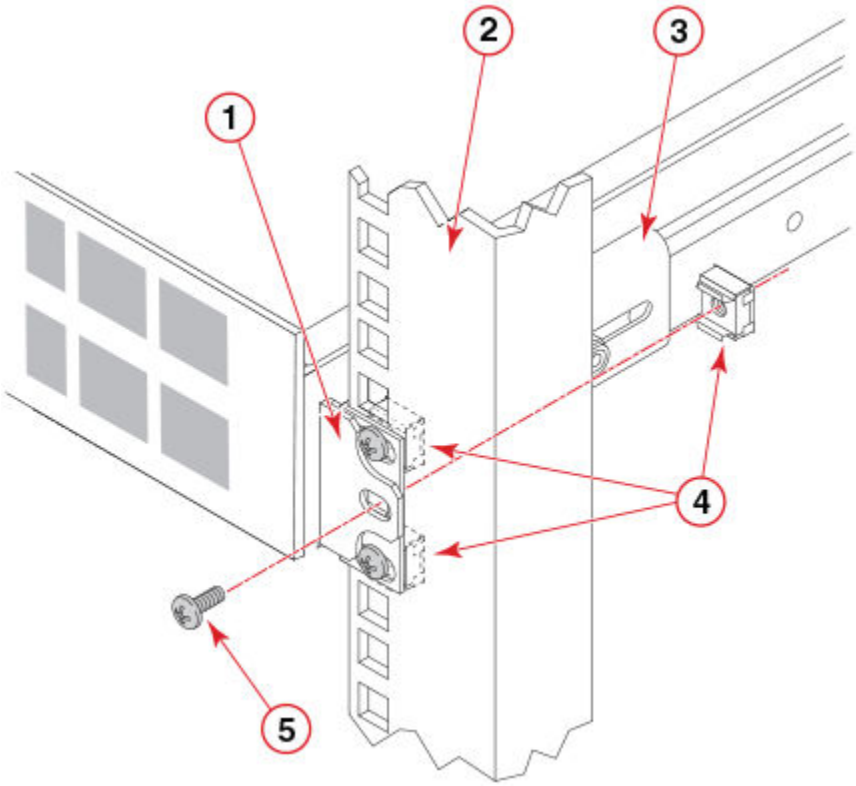
   Refer to Figure 27 for a round-hole rack post; refer to Figure 28 (Method A) or Figure 29 (Method B) for a square-hole rack post.

FIGURE 27 Securing rack mount brackets for round-hole rack posts



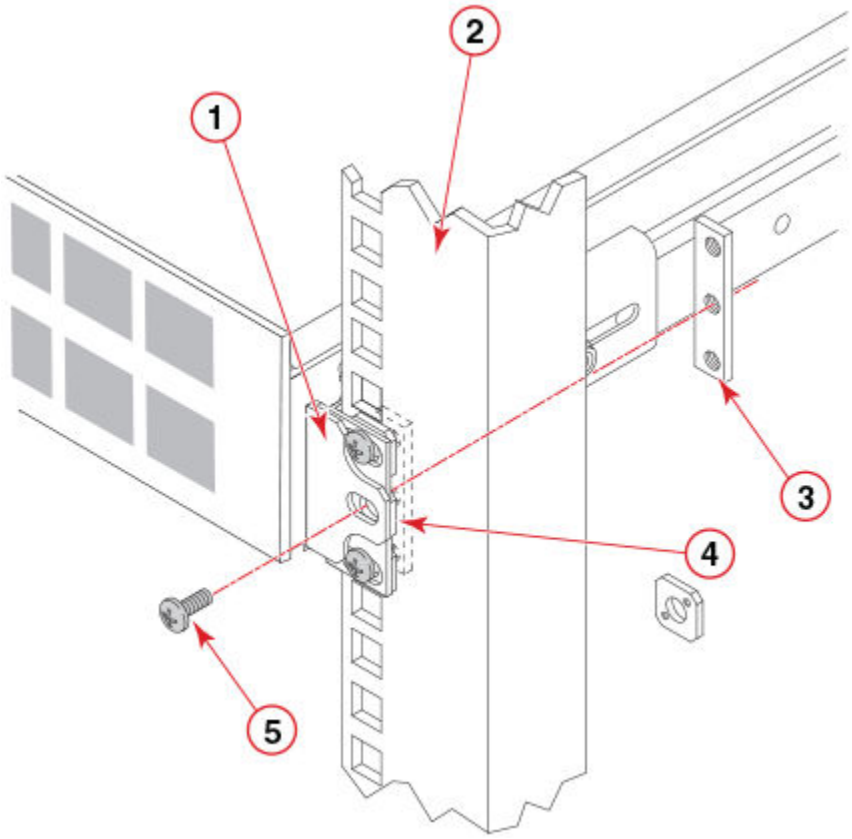
1. Right rack mount bracket
2. Rack post
3. Three-hole rack nut bar, 8-32
4. Phillips screw, 10-32 x 1/2 in., black

FIGURE 28 Method A for securing rack mount brackets for square-hole rack posts



1. Right rack mount bracket
2. Rack post
3. Three-hole slide mount L-bracket
4. Retainer nut, 10-32
5. Phillips screw, 10-32 x 1/2 in., black

FIGURE 29 Method B for securing rack mount brackets for square-hole rack post



1. Right rack mount bracket
2. Rack post
3. Three-hole rack nut bar, 8-32
4. Alignment washer (previously installed)
5. Phillips screw, 10-32 x 1/2 in., black

Installing the 1U and 2U Non-Port Side Fixed-Mount Rack Kit (15"-20") for Four-Post Racks (XNA-000072 and XNA-100072)

Use the following instructions to install a fixed-port device in a 19-inch (48.3 cm) EIA rack using the 1U and 2U Non-port Side Fixed Rack Mount Kit (15"-20") for Four-Post Racks.

Observe the following when mounting this device:

- Use Electronic Industries Association (EIA) standard racks. Provide space in a 19-inch (48.3 cm) EIA rack, as required for the device type, with a minimum distance of 24 in. (60.96 cm) and a maximum distance of 32 in. (81.28 cm) between the front and back posts.
- The rack kit is designed so that the device is installed with the non-port side flush with the front posts of the rack.
- Two people are required to install the device in a rack. One person holds the device, while the other secures the device to the rack.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Time and items required

Allow 15 to 30 minutes to complete this procedure.

The following items are required to install a device using the Non-port Side Fixed Rack Mount Kit (15"-20"):

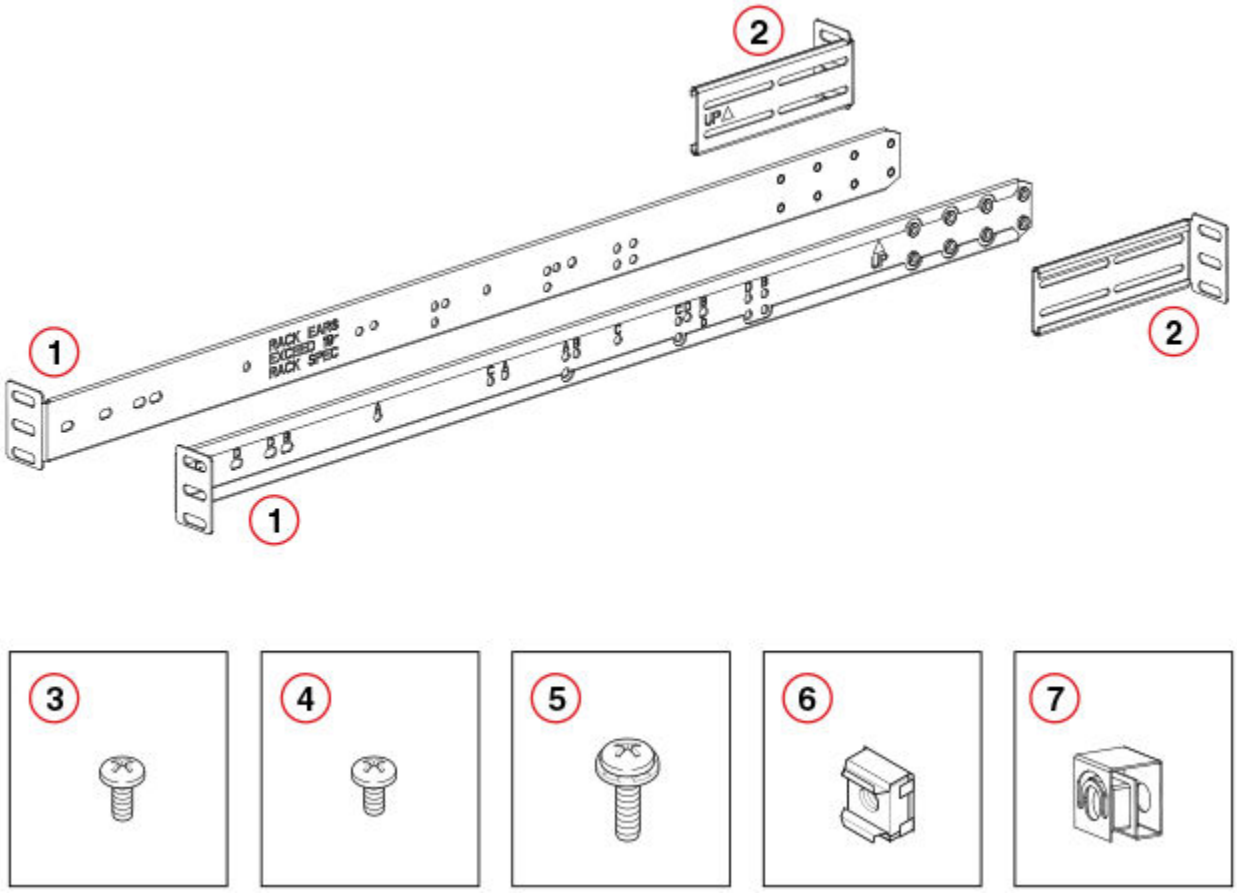
- Rack mount kit
- #2 Phillips screwdriver with torque capability

CAUTION
Use the screws specified in the procedure. Using longer screws can damage the device.

Parts list

The following parts are provided with the 1U and 2U Non-Port Side Fixed-Mount Rack Kit (15"-20") for Four-Post Racks (XNA-000072 and XNA-100072).

FIGURE 30 Rack kit parts



1. Brackets, front (2)
2. Brackets, rear short (2)
3. Screws, 8-32 x 5/16-in., panhead Phillips with patchlock (10)
4. Screws, 6-32 x 1/4-in., panhead Phillips with patchlock (8)
5. Screws, 10-32 x 5/8-in., panhead Phillips (8)
6. Retainer nuts, 10-32, for square-hole rack posts (8)
7. Clip nuts, 10-32, for round-hole rack posts (8)

NOTE
The brackets in the kit are labeled UP with an upward pointing arrowhead to reduce confusion in mounting.

NOTE
Depending on the device type , not all parts may be used in an installation.

Attaching the front brackets

CAUTION
The device must be turned off and disconnected from the fabric during this procedure.

Complete the following steps to attach the front brackets to the device.

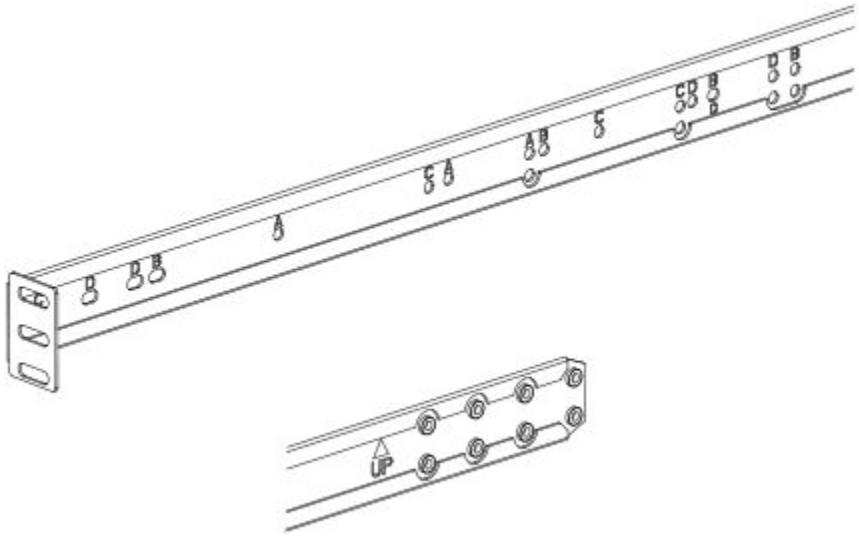
NOTE
Pay particular attention to the labeling on the brackets.

Refer the following figure. There are four pairs of vertically aligned holes in the brackets. Each pair is labeled with a letter as are a number of single holes along the length of the bracket. Each letter corresponds to a specific device's mounting holes.

For the Brocade G610 use the holes marked with the letter 'A'.

NOTE
Example illustrations in the following procedures may show the screws inserted in holes designated for devices other than the device that you are installing. Be sure to use holes designed for installing your device.

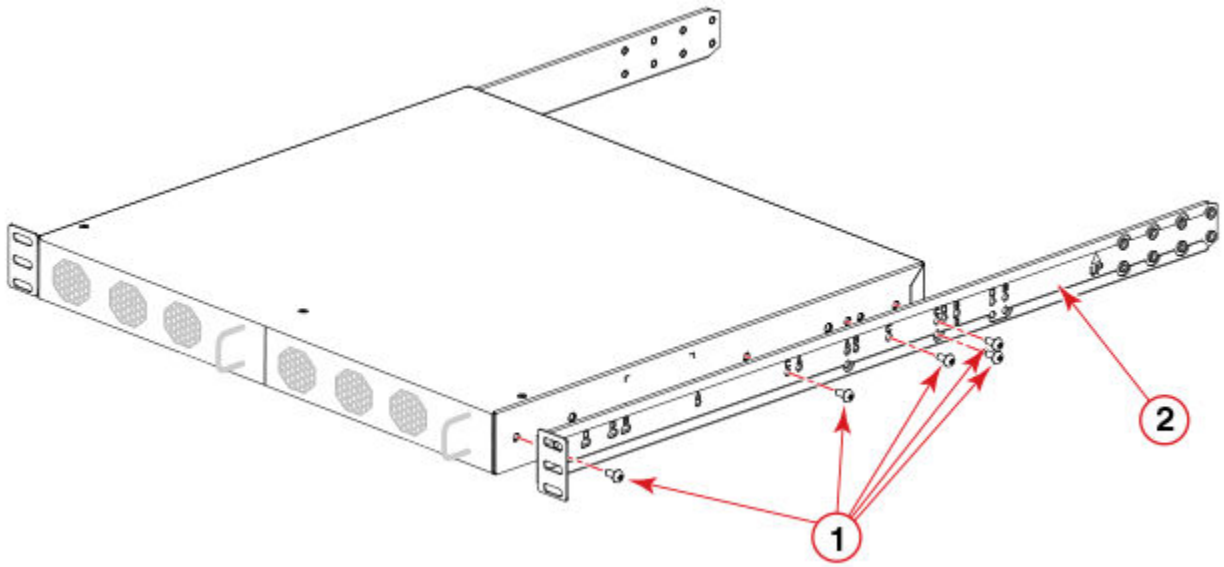
FIGURE 31 Enlarged view of the front right bracket showing labels



1. Position the right front bracket with the flat side against the right side of the device as shown in the following figure. Be sure that the arrowhead is pointing upward when mounted.
2. Insert two 8-32 x 5/16-in. screws into one of the pairs of vertically aligned holes in the bracket and then into the pair of holes on the side of the device.

3. Insert each of three additional 8-32 x 5/16-in. screws through the holes in the bracket and into the corresponding holes in the device as shown in the following figure. Be sure to use holes with the same label. Tighten all 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).
4. Repeat step 1 through step 3 to attach the left front bracket to the left side of the device. Again, be sure that the arrowhead is pointing upward when mounted and that you are using the holes with the same labels as you used on the right side.

FIGURE 32 Attaching the front bracket



1. Screws, 8-32 x 5/16 in., panhead Phillips (5 per side)
2. Bracket, front right

Installing the device in the rack

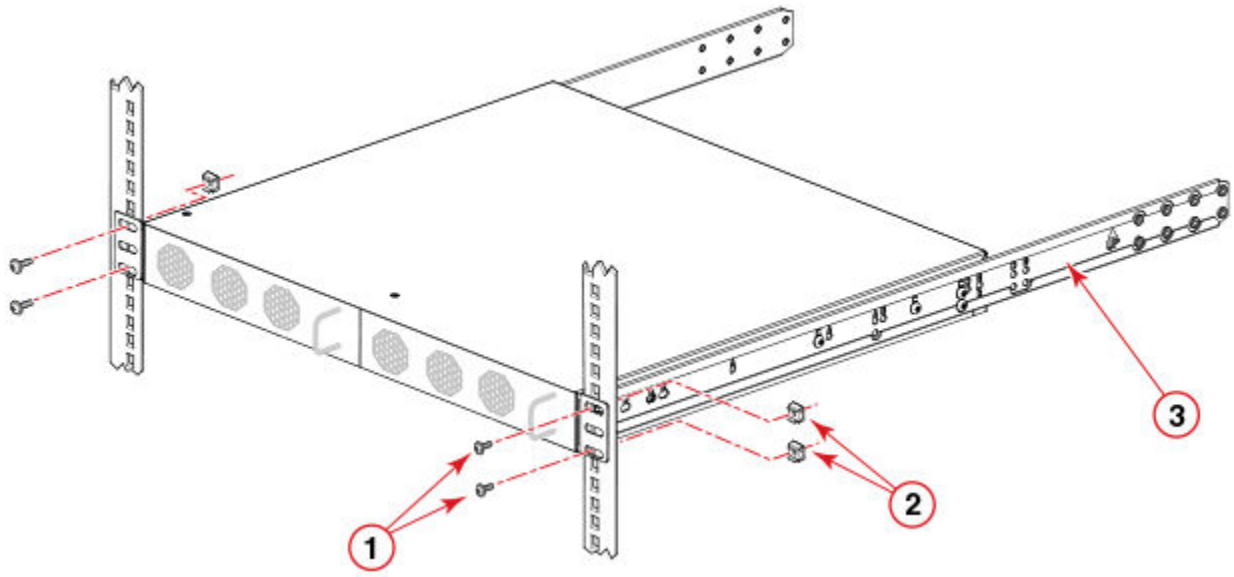
NOTE
Two people are required to install the device in a rack. One person can hold the device while the other attaches it to the rack.

Complete the following steps to install the device in the rack.

1. Position the device in the rack as shown in the following figure, providing temporary support under the device until the device is secured to the rack.
2. Attach the right front bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts. Select the correct nuts for either square or round holes in the rack posts.

3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. screws and two nuts and tighten all 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 33 Positioning the device in the rack



1. Screws, 10-32 x 5/8 in., panhead Phillips
2. Retainer nuts, 10-32, square or round hole as needed
3. Bracket, front right

Attaching the rear brackets to the front brackets

NOTE

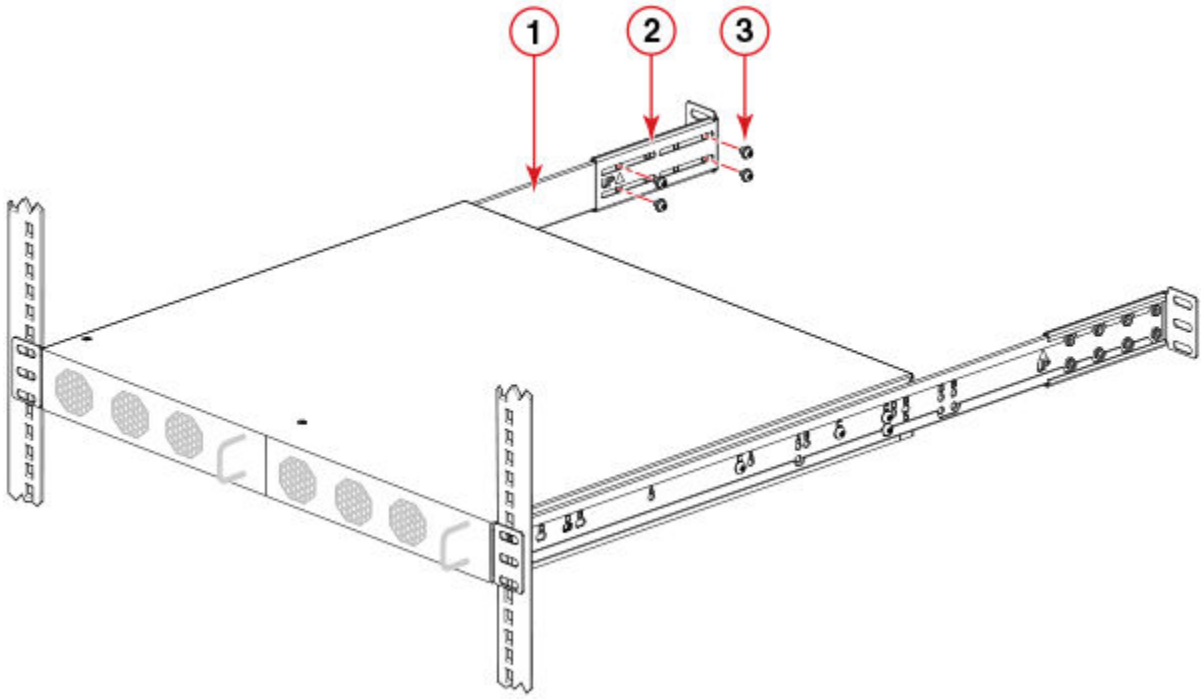
The rear brackets in the kit are also labeled UP with an upward pointing arrowhead to reduce confusion in mounting.

Complete the following steps to attach the rear brackets to the front brackets.

1. Position the right rear bracket inside the right front bracket.
2. Attach the brackets using four 6-32 x 1/4-in. screws as shown in the following figure.
3. Adjust the brackets to the rack depth and tighten the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

4. Repeat step 1 through step 3 to attach the left rear bracket to the left front bracket.

FIGURE 34 Attaching the rear brackets to the front brackets



1. Bracket, front left
2. Bracket, rear left
3. Screws, 6-32 x 1/4 in., panhead Phillips (4 per side)

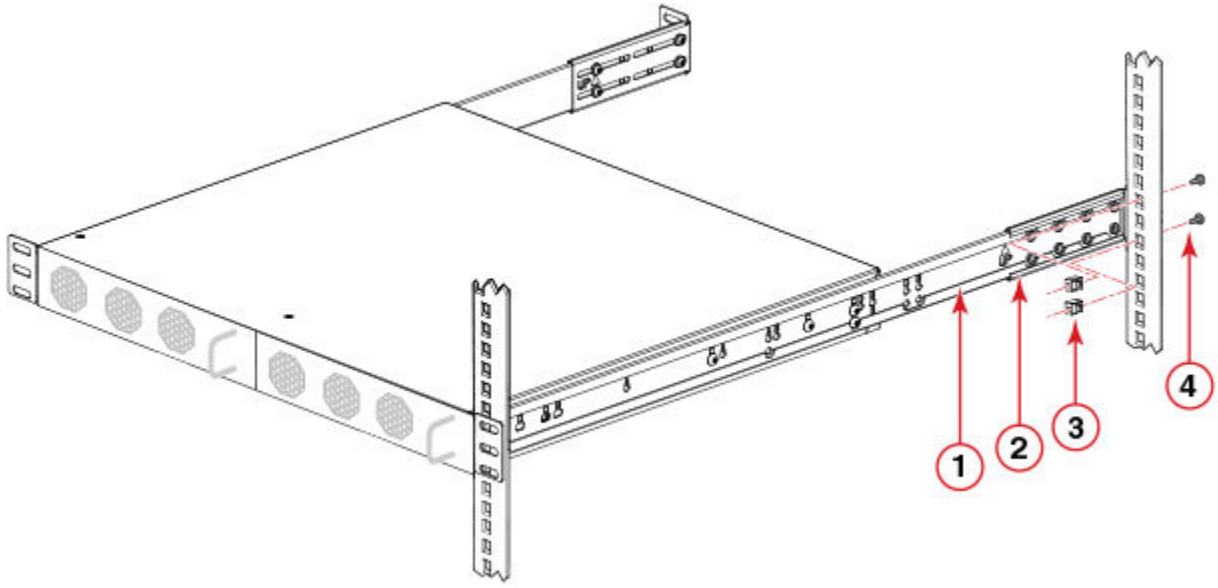
Attaching rear brackets to the rack posts

Complete the following steps to attach the rear brackets to the rack posts.

1. Attach the right rear bracket to the right rear rack post using two 10-32 x 5/8-in. screws and two retainer nuts as shown in the following figure. Select the correct retainer nuts for either square or round holes in the rack posts.

2. Attach the left rear bracket to the left rear rack post using two 10-32 x 5/8-in. screws and two retainer nuts and tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

FIGURE 35 Attaching the rear bracket to the rack post



1. Bracket, front right
2. Bracket, rear right
3. Retainer nuts, 10-32, square or round holes as needed
4. Screws, 10-32 x 5/8 in., panhead Phillips

Initial Setup and Verification

Items required

The following items are required for initial setup and verification of the device:

- The device, mounted and installed with the required power supply and fan assemblies, transceivers, and cables; and connected to a power source
- A workstation computer with a terminal emulator application installed, such as PuTTY, XShell or SecureCRT on Windows
- An unused IP address with corresponding subnet mask and gateway address
- A serial cable with an RJ-45 connector
- An Ethernet cable
- Access to an FTP server or USB device for backing up (uploading) or downloading the device configuration (optional)

Providing power to the device

Perform the following steps to provide power to the device.

1. Connect the power cord to the power supply, and then to the power source. Ensure that the power cord has a minimum service loop of 6 inches available and routed to avoid stress.
   The system power supply LED displays amber until power-on self-test (POST) is complete, and then change to green. The switch usually requires several minutes to boot and complete POST.
2. After POST is complete, verify that the switch power and switch status LEDs are green.

   For more information about how to interpret POST, BOOT, and diagnostics tests, refer to Monitoring the Device on page 75.

Establishing a first-time serial connection

Perform the following steps to log in to the device through the serial connection.

1. Connect the serial cable to the serial port on the device and to an RS-232 serial port on the workstation.

   If the serial port on the workstation is RJ-45 instead of RS-232, remove the adapter on the end of the serial cable and insert the exposed RJ-45 connector into the RJ-45 serial port on the workstation.

2. Disable any serial communication programs running on the workstation such as synchronization programs.
3. Open a terminal emulator application such as PuTTY, XShell, or SecureCRT on a Windows PC, or TERM, TIP, or C-Kermit in a LINUX environment, and configure the application as follows:
   - In a Windows environment, use the following values:

Parameter	Value
Bits per second	9600
Databits	8
Parity	None
Stop bits	1
Flow control	None (must be disabled on the host side)

NOTE
Flow control is not supported on the serial connection when attached to a remote terminal and must be disabled on the customer-side remote terminal server in addition to the host-side clients.

   - In a UNIX environment using TIP, enter the following string at the prompt:

```
tip /dev/ttyb -9600.
```

     If ttyb is already in use, use ttya instead and enter the following string at the prompt:

```
tip /dev/ttya -9600
```

4. When the terminal emulator application stops reporting information, press **Enter** to display the login prompt.

```
Switch Console Login:
```

5. Log in to the device as admin, using the default password: **password**. You are prompted to change the default admin and user passwords at initial login. Make sure to write down the new passwords and keep this information in a secure location.

```
Fabric OS (swDir)
swDir login: admin
Password:
Please change your passwords now.
Use Control-C to exit or press 'Enter' key to proceed.
swDir:admin>
```

6. (Optional) Modify passwords. To skip modifying the password, press **Ctrl+C**.

NOTE
Passwords can be 8 to 40 characters long. They must begin with an alphabetic character. They can include numeric characters, the period (.), and the underscore (_) only. Passwords are case-sensitive, and they are not displayed when you enter them on the command line.

Configuring the IP address

You can configure the device with a static IP address, or you can use a Dynamic Host Configuration Protocol (DHCP) server to set the IP address of the switch. DHCP is enabled by default. The device supports both IPv4 and IPv6 addresses.

Using DHCP to set the IP address

When using DHCP, the switch obtains its IP address, subnet mask, and default gateway address from the DHCP server. The DHCP client can only connect to a DHCP server that is on the same subnet as the switch. If your DHCP server is not on the same subnet as the switch, use a static IP address.

Setting a static IP address

To set a static IP address for the device, complete the following steps.

1. Log in to the device as admin.
2. Use the **ipaddrset** command to set the Ethernet IP address.
   - If you are going to use an IPv4 address, enter the IP address in dotted decimal notation as prompted.

     ```
     Ethernet IP Address: [192.168.74.102]
     ```
   - If you are going to use an IPv6 address, enter the network information in colon-separated notation as prompted.

     ```
     device:admin> ipaddrset -ipv6 --add 1080::8:800:200C:417A/64
     IP address is being changed...Done.
     ```
3. Complete the rest of the network information as prompted. (IPv4 format shown):

   ```
   Ethernet Subnetmask: [255.255.255.0]
   Ethernet IP Address: [192.168.74.102]
   Gateway IP Address: [192.168.74.1]
   ```
4. Enter **off** to disable DHCP when prompted.

   ```
   DHCP [OFF]: off
   ```

Setting the date and time

The date and time settings are used for logging events, error detection, and troubleshooting. However, device operation does not depend on the date and time; a device with incorrect date or time values still functions properly.

You can synchronize the local time of the principal or primary fabric configuration server (FCS) device to that of an external Network Time Protocol (NTP) server.

Perform the following steps to set the date and time.

1. Log in to the device as admin.

2. Enter the **date** ["*newdate*"] command at the command line.

   The *newdate* variable specifies the new date and time enclosed in double quotation marks. The operand is optional; if omitted, the current date and time is displayed. Date and time are specified as a string in the *mmddhhmmyy* format:

   - *mm*: Specifies the month. Valid values are 01 to 12.
   - *dd*: Specifies the date. Valid values are 01 to 31.
   - *hh*: Specifies the hour. Valid values are 00 to 23.
   - *mm*: Specifies the minutes. Valid values are 00 to 59.
   - *yy*: Specifies the year, valid values are 00 to 37 and 70 to 99. Year values from 70 to 99 are interpreted as 1970 to 1999; year values from 00 to 37 are interpreted as 2000 to 2037.

   ```
   device:admin> date
   Thu Dec 22 14:05:10 UTC 2016
   device:admin> date "1222140616"
   Thu Dec 22 14:06:00 UTC 2016
   ```

Setting the time zone

The default time zone is Coordinated Universal Time (UTC). The time zone must be set only once because the value is stored in nonvolatile memory. Use the following procedure to set the time zone.

1. Log in as admin.
2. Use the **tsTimeZone --interactive** command and follow the prompts, or enter the **tsTimeZone** [*houroffset* [, *minuteoffset*]] command as follows:

   For Pacific Standard Time, enter **tsTimeZone -8,0**.

   For Central Standard Time, enter **tsTimeZone -6,0**.

   For Eastern Standard Time, enter **tsTimeZone -5,0**.

   TABLE 6 tsTimeZone command parameter selection for the US time zones

Local time	tsTimeZone parameter (difference from UTC)
Atlantic Standard	-4,0
Atlantic Daylight	-3,0
Eastern Standard	-5,0
Eastern Daylight	-4,0
Central Standard	-6,0
Central Daylight	-5,0
Mountain Standard	-7,0
Mountain Daylight	-6,0
Pacific Standard	-8,0
Pacific Daylight	-7,0
Alaskan Standard	-9,0
Alaskan Daylight	-8,0
Hawaiian Standard	-10,0

Synchronizing local time with an external source

Perform the following steps to synchronize the local time of the principal or primary FCS device with that of an external NTP server.

1. Log in as admin.
2. Enter the **tsClockServer** *ipaddr* command.

   The *ipaddr* variable represents the IP address of the NTP server that the device can access. This argument is optional; by default, the value is "LOCL".

```
switch:admin> tsclockserver 192.168.126.60
Updating Clock Server configuration...done.
Updated with the NTP servers
```

Customizing the chassis name and switch name

Changing the chassis and switch names is important for distinguishing and identifying the device uniquely and for accurate tracking of logs and errors. The messages that appear in the log are labeled with the switch name or chassis name, which makes tracking the errors much easier. Specify an easily understandable and meaningful name for the chassis and switch names.

Perform the following steps to change the chassis name and then the switch name.

1. Log in to the device through Telnet using the admin account.
2. Change the chassis name by using the **chassisName** command.

```
device:admin> chassisname Chassis_001
```

3. Change the switch name by using the **switchName** command.

```
device:admin> switchname Switch_001
Committing configuration...
Done
Switch name has been changed. Please re-login to the switch for the change to applied
```

Establishing an Ethernet connection

Perform the following steps to establish an Ethernet connection to the device.

1. Remove the plug from the Ethernet port.
2. Connect an Ethernet cable to the device Ethernet port and to the workstation or to an Ethernet network containing the workstation.

   NOTE

   At this point, the device can be accessed remotely, using either command line or Brocade Web Tools. Ensure that the device is not being modified from any other connections during the remaining tasks in this chapter. The Ethernet management port also supports Auto MDI/MDIX.

Setting the domain ID

Perform the following steps to set the switch domain ID.

1. Log in to the switch through Telnet using the admin account.
2. Modify the domain ID if required.

   The default domain ID is 1. If the switch is not powered on until after it is connected to the fabric and the default domain ID is already in use, the domain ID for the new switch is automatically reset to a unique value. If the switch is connected to the fabric after it has been powered on and the default domain ID is already in use, the fabric segments. To find the domain IDs that are currently in use, enter the **fabricShow** command on another switch in the fabric.

   Perform the following steps to modify the domain ID.

   a) Disable the switch by entering the **switchDisable** command.

   b) Enter the **configure** command. The command prompts display sequentially; enter a new value or press **Enter** to accept each default value.

   c) Enter **y** after the "Fabric param" prompt.

   ```
   Fabric param (yes, y, no, n): [no] y
   ```

   d) Enter a unique domain ID (such as the domain ID used by the previous switch, if still available).

   ```
   Domain: (1..239) [1] 3
   ```

   e) Complete the remaining prompts or press **Ctrl+D** to accept the remaining settings without completing all the prompts.

   f) Re-enable the switch by entering the **switchEnable** command.

Verifying correct operation

Perform the following steps to verify correct operation of the device.

1. Check the LEDs to verify that all components are functional.

2. Verify the correct operation of the device by entering the following commands from the workstation.

Command	Description
psShow	Displays power supply status and information
fanShow	Displays fans status and information
switchShow	Displays switch status and information
tempShow	Displays temperature status and information
historyShow	Displays the device history
errDump	Displays any errors

The **switchShow** command provides the following information about the device and ports status.

```
device#> switchshow
switchName:     sb_70
switchType:     170.0
switchState:    Online
switchMode:     Native
switchRole:     Subordinate
switchDomain:   70
switchId:       fffc46
switchWwn:      10:00:00:05:1e:65:79:04
zoning:         ON (PERF_CFG)
switchBeacon:   OFF
Fabric Name:    abcfabric
HIF mode:       OFF

Index Port Address Media Speed       State    Proto
==================================================
   0   0   460000   id    N32      Online      FC  F-Port  20:05:00:11:0d:a8:01:00
   1   1   460100   id    N32      Online      FC  F-Port  20:01:00:11:0d:bb:01:00
   2   2   460200   id    N32      Online      FC  F-Port  20:03:00:11:0d:84:01:00
   3   3   460300   id    N32      Online      FC  F-Port  20:07:00:11:0d:26:01:00
   4   4   460400   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:5c:c5:01
   5   5   460500   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:58:4c:00
   6   6   460600   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:5c:c9:01
   7   7   460700   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:5c:bd:00
   8   8   460800   --    N32      No_Module   FC
   9   9   460900   --    N32      No_Module   FC
  10  10   460a00   --    N32      No_Module   FC
  11  11   460b00   --    N32      No_Module   FC
  12  12   460c00   --    N32      No_Module   FC
  13  13   460d00   --    N32      No_Module   FC
  14  14   460e00   --    N32      No_Module   FC
  15  15   460f00   --    N32      No_Module   FC
  16  16   461000   --    N32      No_Module   FC
  17  17   461100   --    N32      No_Module   FC
  18  18   461200   --    N32      No_Module   FC
  19  19   461300   --    N32      No_Module   FC
  20  20   461400   --    N32      No_Module   FC
  21  21   461500   --    N32      No_Module   FC
  22  22   461600   --    N32      No_Module   FC
  23  23   461700   --    N32      No_Module   FC
<Output truncated>
```

Backing up the configuration

Brocade recommends backing up the configuration on a regular basis to ensure that a complete configuration is available for downloading to a replacement switch.

1. Log in to the device as the admin user.

2. Back up the device configuration to an FTP server by entering the **configUpload** command and following the prompts.

```
sb_70:admin> configupload
Protocol (scp, ftp, local) [ftp]:
Server Name or IP Address [host]: 192.168.0.100
User Name [user]: anonymous
Path/Filename [<home dir>/config.txt]: /dumps/supportsave/pz/switch85/G20-1.txt
Section (all|chassis|switch [all]): all
configUpload complete: All selected config parameters are uploaded
```

   This command uploads the device configuration to the server, making it available for downloading to a replacement device if necessary.

Powering down the device

Complete the following steps to power down the device.

1. Shut down the Fabric OS software using the **sysShutdown** command.
2. Unplug the power cable from the power source before servicing the device.

Installing Transceivers and Cables

Time and items required

The installation or replacement procedure for one transceiver takes less than five minutes. Ensure that the following items are available:

- Required number of compatible power cables
- Required number of supported Brocade-branded transceivers

  Refer to the *Fabric OS Release Notes* for the list of supported transceivers and cables.
- Required number of compatible fiber-optic cables
- Optical transceiver extraction tool (for 10-Gbps transceiver only)

NOTE

Most Brocade switches, backbones, and directors come with a transceiver extraction tool and holster. The extraction tool is designed to remove transceivers from modules where the space is limited.

FIGURE 36 Optical transceiver extraction tool

Precautions specific to transceivers and cables

DANGER

All fiber-optic interfaces use Class 1 lasers.

DANGER

Use only optical transceivers that are qualified by Brocade Communications Systems, Inc. and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 60825 and EN60825. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

CAUTION

Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

Cleaning the fiber-optic connectors

To avoid problems with the connection between the fiber-optic transceiver (SFP+ or QSFP) and the fiber cable connectors, Brocade strongly recommends cleaning both connectors each time you disconnect and reconnect them. Dust can accumulate on the connectors and cause problems such as reducing the optic launch power.

To clean the fiber cable connectors, Brocade recommends using a fiber-optic reel-type cleaner. When not using an SFP+, or QSFP connector, make sure to keep the protective covering in place.

Managing cables

The minimum bend radius for a 50 micron cable is 2 inches under full tensile load and 1.2 inches with no tensile load. Cables can be organized and managed in a variety of ways, for example, using cable channels on the sides of the rack or patch panels to minimize cable management. Follow these recommendations:

NOTE

You should not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.

CAUTION

Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

- Plan for rack space required for cable management before installing the switch.
- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the switch, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.
- If you are using Brocade ISL Trunking, consider grouping cables by trunking groups. The cables used in trunking groups must meet specific requirements, as described in the *Fabric OS Administrator's Guide* .
- For easier maintenance, label the fiber-optic cables and record the devices to which they are connected.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.
- Use hook and loop style straps to secure and organize fiber-optic cables.

Installing an SFP+ transceiver

The device supports only Brocade-qualified transceivers. If you use an unqualified transceiver, the **switchshow** command output shows the port in a Mod_Inv state. Fabric OS also logs the issue in the system error log. To insert an SFP+ transceiver, complete the following steps:

NOTE

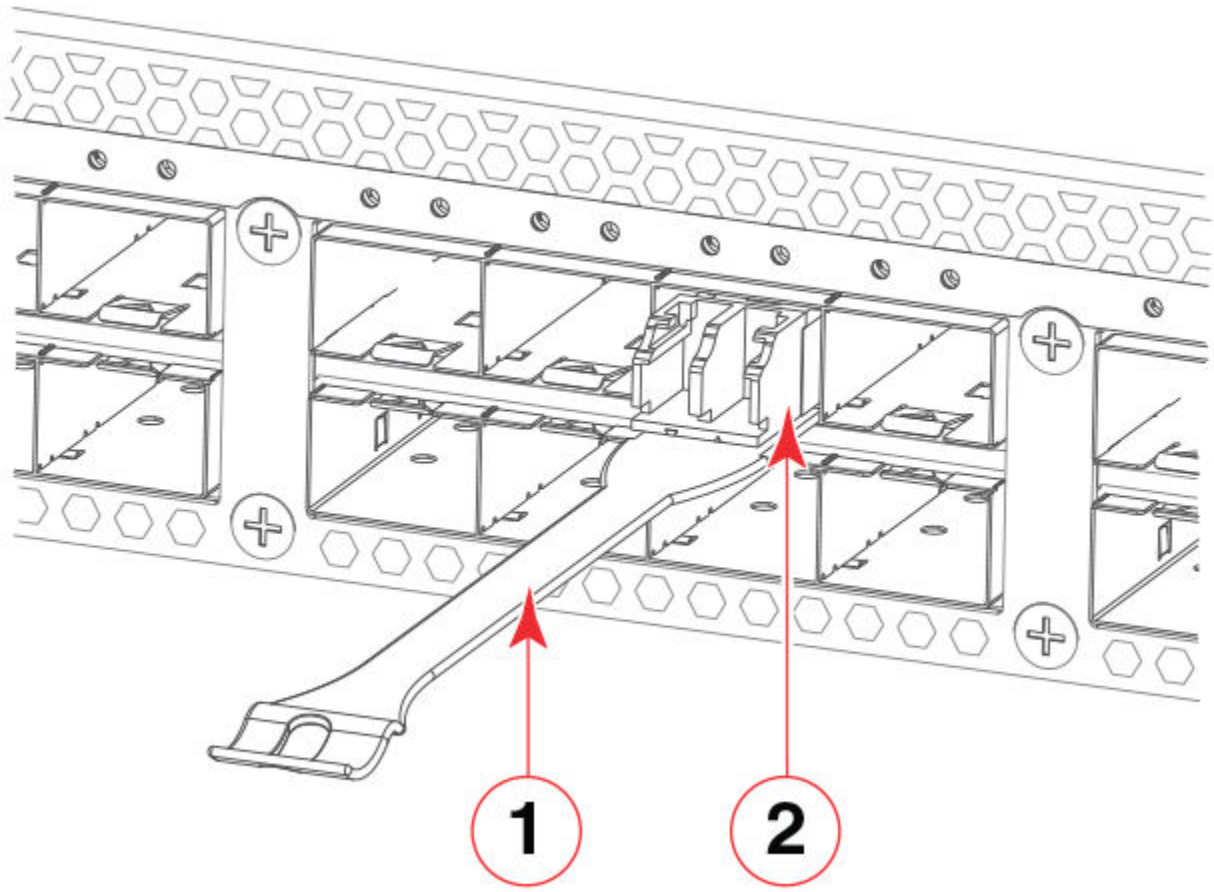
The 16- and 32-Gbps SFP+ transceivers do not have bails. Always use the pull tab to insert or remove the transceivers, as the SFP might be hot.

1. Use the pull tab on the 16- and 32-Gbps SFP+ transceivers to help push the transceiver into the port. Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented. Push the correctly oriented transceiver into the port until it is firmly seated and the latching mechanism clicks.

   NOTE

   Each SFP+ transceiver has a 10-pad gold-plated PCB-edge connector on the bottom. The correct position to insert an SFP+ transceiver into the upper row of ports is with the gold edge down. The correct position to insert an SFP+ transceiver into the lower row of ports is with the gold edge up.

FIGURE 37 Installing a 32-Gbps SFP+ transceiver into an upper port



1. Pull tab
2. Transceiver

2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   NOTE
   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented. Do not insert any unsupported cable intended for an other type of transceiver into a regular SFP+ transceiver. You may damage the cable as well as the transceiver.

Replacing an SFP+ transceiver

Complete the following steps to remove and then install a new SFP+ transceiver.

NOTE
16- and 32-Gbps SFP+ transceivers have pull tabs instead of bails. Always use the pull tab to insert or remove the SFP+ transceivers, as the SFP might be hot.

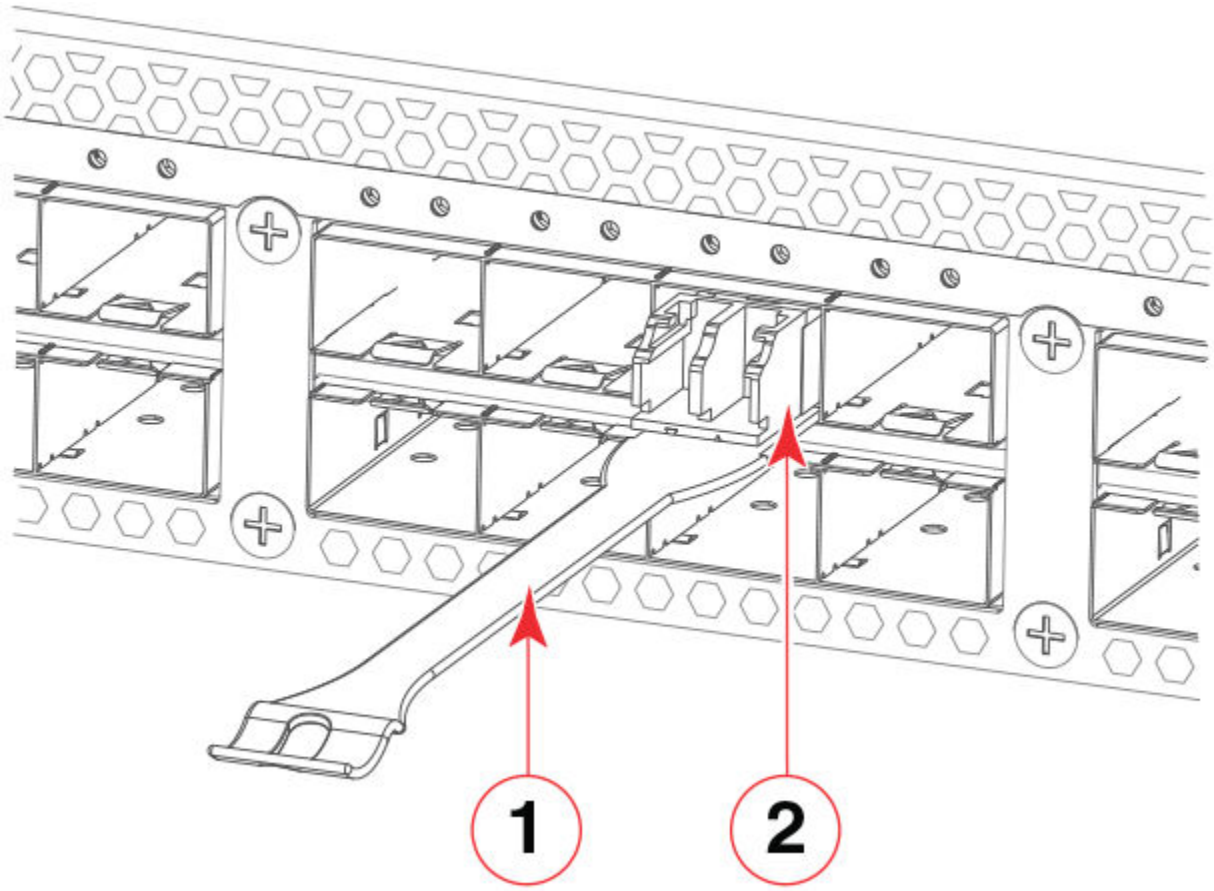
1. Remove any cables that are inserted into the transceiver.
2. Grasp the SFP+ transceiver pull tab and pull the tab straight out.

   NOTE
   Grasp the tab near the body of the transceiver to reduce the chances of bending the pull tab. As the SFP may be hot, avoid touching it.

3. To insert the replacement transceiver, use the pull tab on the SFP+ transceiver to carefully push the transceiver into the port. Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

   NOTE
   Each SFP+ transceiver has a 10-pad gold-plated PCB-edge connector on the bottom. The correct position to insert an SFP+ transceiver into the upper row of ports is with the gold edge down. The correct position to insert an SFP+ transceiver into the lower row of ports is with the gold edge up.

FIGURE 38 Replacing a 32-Gbps SFP+ transceiver in a upper port



1. Pull tab
2. Transceiver

4. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.

Verifying the operation of new transceivers

You can use the following commands to verify if the transceivers are working correctly:

- **sfpShow**
- **switchShow**
- **errDump**
- **fabricShow**

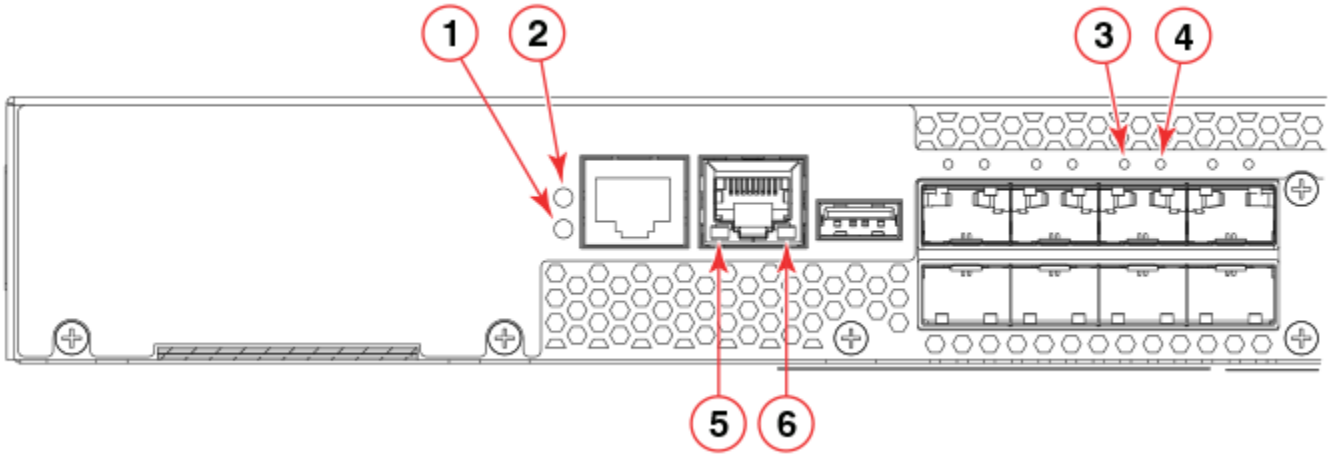
Refer to the *Brocade Fabric OS Command Reference* for output examples and descriptions.

Monitoring the Device

Interpreting port-side LEDs

System activity and status can be determined through the activity of the LEDs on the switch. There are three possible LED states: no light, a steady light, and a flashing light. Flashing lights may be slow, fast, or flickering. The lights are green or amber. Sometimes, the LEDs may flash either of the colors during boot, POST, or other diagnostic tests. This is normal; it does not indicate a problem unless the LEDs do not indicate a healthy state after all boot processes and diagnostic tests are complete.

FIGURE 39 Brocade G610 port-side LEDs



1. System status LED
2. System power LED
3. SFP+ (upper) port 2 status LED
4. SFP+ (lower) port 6 status LED
5. Eth port Link/Speed LED
6. Eth port Activity LED

NOTE

There are four built-in fans in Brocade G610. The device continues to run even if two fans fail. However, if the third fan fails, the device will shut down.

Interpreting the POST results

Each time the switch is powered on, rebooted, or reset, the switch performs a power-on self-test (POST). Total boot time with the POST can be several minutes. The POST can be omitted after subsequent reboots by using the **fastboot** command or entering the **diagDisablePost** command to persistently disable the POST. The success or failure results of the diagnostic tests that run during POST can be monitored through LED activity, the error log, or the command line interface. During the POST, the LEDs flash different colors.

The POST includes the following tasks:

- Conducts preliminary POST diagnostics.
- Initializes the operating system.
- Initializes hardware.
- Runs diagnostic tests on several functions, including circuitry, port functionality, memory, statistics counters, and serialization.

Perform the following steps to determine whether POST completed successfully and whether any errors were detected.

1. Verify that the LEDs on the device indicate that all components are healthy. If one or more LEDs do not display a healthy state:
   a) Verify that the LEDs are not set to "beacon" (this can be determined through the **switchShow** command or Web Tools).
   b) Follow the recommended action for the observed LED behavior.
2. Verify the **diagShow** command displays that the diagnostic status for all ports in the device is OK.
3. Review the system log for errors. Errors detected during POST are written to the system log, which can be viewed by using the **errShow** command.

Interpreting the BOOT results

BOOT includes the following tasks after POST is complete.

1. Performs universal port configuration.
2. Initializes links.
3. Analyzes the fabric. If any ports are connected to other switches, the switch participates in a fabric configuration.
4. Obtains a domain ID and assigns port addresses.
5. Constructs unicast routing tables.
6. Enables normal port operation.

Running diagnostic tests

In addition to the POST, Fabric OS includes diagnostic tests to help you troubleshoot the hardware and firmware. This includes tests of internal connections and circuitry, fixed media, and the transceivers and cables in use.

The tests are implemented by command, either through a Telnet session or through a terminal set up for a serial connection to the device. Some tests require the ports to be connected by external cables to allow diagnostics to verify the serializer/deserializer interface, transceiver, and cable. Some tests require loopback plugs.

Diagnostic tests are run at supported link speeds depending on the speed of the link being tested and the type of port.

NOTE
Diagnostic tests may temporarily lock the transmit and receive speed of the links during diagnostic testing.

Brocade recommends that you power-cycle the device after completing offline diagnostics tests.

Brocade G610 Technical Specifications

This document highlights the features and specifications for the Brocade G610 switch.

System specifications

System component	Description
Enclosure	1U, nonport-side intake airflow, port-side power inlet
Power inlet	C13; power from port side
Power supplies	Single, fixed power supply
Fans	Four built-in fans
Cooling	Nonport-side to the port side
System architecture	Nonblocking shared memory switch
System processors	Freescale T1022E CPU
Port-to-port latency	<900 nanoseconds with no contention (destination port is free) including FEC using cut-through frame switching.

Fibre Channel

System component	Description
Fibre Channel ports	24 SFP+ ports (8-port increments through capacity-based Ports on Demand (PoD) licenses) that support any combination of Short Wavelength (SWL) and Long Wavelength (LWL) or Extended Long Wavelength (ELWL) optical media. The SFP+ ports are capable of auto-negotiating to 4, 8, 16, or 32 Gbps speed depending on the SFP+ model and the minimum supported speed of the optical transceiver at the other end of the link. • 4-, 8-, and 16-Gbps performance is enabled by 16-Gbps SFP+ transceivers provided the other end of the connection has a minimum of 4 Gbps speed set on the port. • 8-, 16-, and 32-Gbps performance is enabled by 32-Gbps SFP+ transceivers provided the other end of the connection has a minimum of 8 Gbps speed set on the port. NOTE 2-, 4-, and 8-Gbps transceivers are not supported.
ANSI Fibre Channel protocol	Fibre Channel Physical and Signaling Interface standard (FC-PH)
Modes of operation	Fibre Channel Class 2 and Class 3
Fabric initialization	Complies with FC-SW-3 Rev. 6.6
FCIP (IP over Fibre Channel)	Complies with FC-IP 2.3 of FCA profile
Port Status	Bicolor LED (amber/green)

Other

System component	Description
Serial console port	One three-wire (Tx, Rx, Gnd) UART serial port

System component	Description
Ethernet management port	One 1000/100/10 Mbps Ethernet port
USB port	One external USB port

LEDs

System component	Description
System power LED	One green system power status LED (upper) on the left side.
System status LED	One bicolor (green/amber) system status LED (lower) on the left side.
Ethernet port link LED	One link LED on the left of the RJ45 connector. This glows green for 1000 Mbps and amber for 100/10 Mbps.
Ethernet port activity LED	One green activity LED on the right of the RJ45 connector.
FC port status LED	24 bicolor (green/amber) port status LEDs. There is one LED for each SFP+ port on the switch.

NOTE

All the LEDs are on the port-side view of the device.

Weight and physical dimensions

Empty weight refers to the device with built-in power supply and fan assemblies but no SFP+ or QSFP transceivers.

Height	Width	Depth	Weight (empty)	Weight (fully loaded)
4.29 cm 1.69 inches	42.88 cm 16.88 inches	30.64 cm 12.06 inches	4.2 kg 9.30 lb	5.75 kg 12.65 lb

Environmental requirements

Condition	Operational	Non-operational
Ambient temperature	0°C to 40°C (32°F to 104°F)	-25°C to 70°C (-13°F to 158°F)
Relative humidity (non-condensing)	10% to 85% at 40°C (104°F)	10% to 90% (Non-condensing)
Altitude (above sea level)	0 to 3000 m (9,842 feet)	0 to 12000 m (39,370 feet)
Shock	20.0 G, 6 ms, half-sine wave	33.0 G, 11 ms, half-sine wave, 3G Axis
Vibration	0.5 G sine, 0.4 gms random, 5 – 500 Hz	2.0 G sine, 1.1 gms random, 5 – 500 Hz
Airflow	Maximum: 54.5 cmh (32.1 cfm) Nominal: 36.35 cmh (21.4 cfm)	N/A
Heat dissipation	Refer to the Power consumption sections.	N/A
Operating noise	Maximum: 64 dBA Normal: 57 dBA	N/A

Power supply specifications

Maximum output power rating (DC)	Input voltage	Input line frequency	Maximum input current	Maximum inrush current
150 W	100 – 240 VAC (nominal) 90 – 264 VAC (range)	50/60 Hz (nominal) 47 – 63 Hz (range)	2.2 A	50 A

Power consumption (typical configuration)

@100 VAC input	@200 VAC input	@48 VDC input	Notes
0.62 A 63.15 W 215.54 BTU/hr	0.33 A 61.40 W 209.56 BTU/hr	N/A	Fully configured all ports with 25% traffic rate, max port speed at 32G, fans at nominal speed, and input power +/- 5% tolerance.

Power consumption (maximum configuration)

@100 VAC input	@200 VAC input	@48 VDC input	Notes
0.75 A 76.52 W 261.17 BTU/hr	0.39 A 74.40 W 253.93 BTU/hr	N/A	Fully configured all ports with 100% traffic rate, max port speed at 32G, fans at high speed, and input power +/- 5% tolerance.

Power consumption (idle configuration)

@100 VAC input	@200 VAC input	@48 VDC input	Notes
0.55 A 55.83 W 190.55 BTU/hr	0.30 A 54.30 W 185.33 BTU/hr	N/A	All optics loaded but not initialized and the system completed boot up, fans at nominal speed, and input power +/- 5% tolerance.

Data port specifications (Fibre Channel)

Port Numbers	Media Type	Description
0 to 23	16- or 32-Gbps SFP+ optical ports	Switch mode (default): 8-, 16-, and 24-port configurations (8-port increments through Ports on Demand [PoD] licenses); can be an F_Port, N_Port, or E_Port. Brocade Access Gateway default port mapping: 16 F_Ports, 8 N_Ports.

Fibre Channel data transmission ranges

Port speed (Gbps)	Cable size (microns)	Short wavelength (SWL)	Long wavelength (LWL)	Extended long wavelength (ELWL)
4	50	150 m (492 ft) (OM2) 380 m (1,264 ft) (OM3) 400 m (1,312 ft) (OM4)	N/A	N/A
	62.5	70 m (229 ft)	N/A	N/A
	9	N/A	30 km (18.6 miles)	N/A
8	50	50 m (164 ft) (OM2) 150 m (492 ft) (OM3) 190 m (623 ft) (OM4)	N/A	N/A
	62.5	21 m (68 ft)	N/A	N/A
	9	N/A	10 km (6.2 miles) 25 km (15.5 miles)	N/A
16	50	35 m (115 ft) (OM2) 100 m (328 ft) (OM3) 125 m (410 ft) (OM4)	N/A	N/A
	62.5	15 m (49 ft)	N/A	N/A
	9	N/A	10 km (6.2 miles) 25 km (15.5 miles)	N/A
32	50	70 m (230 ft) (OM3) 100 m (328 ft) (OM4)	N/A	N/A
	62.5	N/A	N/A	N/A
	9	N/A	10 km (6.2 miles)	N/A

Serial port specifications (pinout RJ-45)

Pin	Signal	Description
1	Not supported	N/A
2	Not supported	N/A
3	UART1_TXD	Transmit data
4	GND	Logic ground
5	GND	Logic ground
6	UART1_RXD	Receive data
7	Not supported	N/A
8	Not supported	N/A

NOTE

These specifications are for connectors on Brocade platforms only.

Serial port specifications (protocol)

Parameter	Value
Baud	9600
Data bits	8
Parity	None
Flow control	None (must be disabled at the host)
Stop bits	1

Memory specifications

Memory	Type	Size
Main Memory	DDR3L SDRAM with 8-bit ECC, SORDIMM package, operating at 1200 MT/s	2 GB, 64-bit
Boot Flash	Parallel NOR flash embedded memory	8 MB
eUSB Module	-	2 GB

Regulatory compliance (EMC)

- FCC Part 15, Subpart B
- EN 55024
- EM 55032 (CE Mark) (Class A)
- ICES-003
- VCCI
- EN 300 386
- CNS 13438
- KN 32
- KN 35
- TCVN 7189
- EN 61000-3-2
- EN 61000-3-3
- GB 9254
- CISPR 32
- 2014/30/EU
- AS/NZS CISPR32 (Australia) (Class A)

Regulatory compliance (safety)

- EN/UL 60825

- EN/UL/CSA/IEC 60950-1
- GB 4943.1
- CNS 14336-1
- 2014/35/EU

Regulatory compliance (environmental)

- 2011/65/EU - Restriction of the use of certain hazardous substance in electrical and electronic equipment (EU RoHS).
- 2012/19/EU - Waste electrical and electronic equipment (EU WEEE).
- 94/62/EC - packaging and packaging waste (EU).
- 2006/66/EC - batteries and accumulators and waste batteries and accumulators (EU battery directive).
- 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (EU REACH).
- Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 - U.S. Conflict Minerals.
- 30/2011/TT-BCT - Vietnam circular.
- SJ/T 11363-2006 Requirements for Concentration Limits for Certain Hazardous Substances in EIPs (China).
- SJ/T 11364-2006 Marking for the Control of Pollution Caused by EIPs (China).

Regulatory Statements

BSMI statement (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，
在這種情況下，使用者會被要求採取某些適當的對策。

Warning:

This is Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Canadian requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE statement

ATTENTION
This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on this device contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Low Voltage Directive (LVD) 2014/35/EU
- EN 55032/EN 55024 (European Immunity Requirements)
  - EN61000-3-2/JEIDA (European and Japanese Harmonics Spec)
  - EN61000-3-3

China CCC statement

China-CCC Warning statements

在维修的时候一定要断开所有电源 (English translation"disconnect all power sources before service")

For non tropical use:

安全说明和标记	汉文	"仅适用于非热带气候条件下安全使用。"
	藏文	
	蒙古文	"ᠵᠦᠬᠡᠨᠢᠭᠡᠳᠦᠯᠬᠦᠨᠳᠡᠭᠡᠷᠡᠭᠰᠡᠨᠬᠠᠯᠤᠭᠠᠴᠢᠭᠠᠷᠲᠠᠢᠭᠠᠨᠤᠭᠤᠯᠤᠭᠤᠷᠠᠨᠳᠤᠭᠤᠢᠯᠠᠭᠳᠠᠭᠠᠨᠠ᠂"
	壮文	Dan hab yungh youq gij dienheiq diuzgen mbouj dwg diegndat haenx ancienz sawjyungh.
	维文	غەيرى ئىسسىق بەلباغ ھاۋا كىلىمائى شارائىتىدىلا بىخەتەر ئىشلەتكىلى بولىدۇ

For altitude 2000 meter and below:

安全说明和标记	汉文	仅适用于海拔2000m以下地区安全使用。
	藏文	
	蒙古文	"ᠲᠤᠭᠤᠰᠬᠢᠷᠡᠭᠲᠡᠶᠢᠨᠠᠮᠳᠠᠷᠬᠢ2000ᠮᠠᠲᠤᠭᠤᠯᠤᠭᠤᠷᠠᠨᠳᠤᠭᠤᠢᠯᠠᠭᠳᠠᠭᠠᠨᠠ᠂"
	壮文	Dan hab yungh youq gij digih haijbaz 2000m doxroengz haenx ancienz sawjyungh.
	维文	دېڭىز يۈزىدىن 2000 مېتر تۆۋەن رايونلاردىلا بىخەتەر ئىشلەتكىلى بولىدۇ

Warning for Class A:

声 明

此为 A 级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

English translation of above statement

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

China ROHS

Refer to the latest revision of the China ROHS document (P/N 53-1000428-xx) which ships with the product.

FCC warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

Germany statement

Machine noise information regulation - 3. GPSGV, the highest sound pressure level value is 70.0 dB(A) in accordance with EN ISO 7779.

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 70.0 dB(A) gemäss EN ISO 7779.

KCC statement (Republic of Korea)

A급 기기 (업무용 방송통신기기): 이 기기는 업무용(A급)으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

Class A device (Broadcasting Communication Device for Office Use): This device obtained EMC registration for office use (Class A), and may be used in places other than home. Sellers and/or users need to take note of this.

VCCI statement

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI－A

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective actions.

Cautions and Danger Notices

Danger Notices

A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Ein Gefahrenhinweis warnt vor Bedingungen oder Situationen die tödlich sein können oder Sie extrem gefährden können. Sicherheitsetiketten sind direkt auf den jeweiligen Produkten angebracht um vor diesen Bedingungen und Situationen zu warnen.

Un énoncé de danger indique des conditions ou des situations potentiellement mortelles ou extrêmement dangereuses. Des étiquettes de sécurité sont posées directement sur le produit et vous avertissent de ces conditions ou situations.

Una advertencia de peligro indica condiciones o situaciones que pueden resultar potencialmente letales o extremadamente peligrosas. También habrá etiquetas de seguridad pegadas directamente sobre los productos para advertir de estas condiciones o situaciones.

General dangers

DANGER

The procedures in this manual are for qualified service personnel.

GEFAHR	Die Vorgehensweisen in diesem Handbuch sind für qualifiziertes Servicepersonal bestimmt.
DANGER	Les procédures décrites dans ce manuel doivent être effectuées par un personnel de maintenance qualifié.
PELIGRO	Los procedimientos de este manual deben llevarlos a cabo técnicos cualificados.

DANGER

Be careful not to accidently insert your fingers into the fan tray while removing it from the chassis. The fan may still be spinning at a high speed.

GEFAHR	Die Finger dürfen nicht versehentlich in das Ventilatorblech gesteckt werden, wenn dieses vom Gehäuse abgenommen wird. Der Ventilator kann sich unter Umständen noch mit hoher Geschwindigkeit drehen.
DANGER	Faites attention de ne pas insérer vos doigts accidentellement dans le boîtier du ventilateur lorsque vous le retirez du châssis. Il est possible que le ventilateur tourne encore à grande vitesse.
PELIGRO	Procure no insertar los dedos accidentalmente en la bandeja del ventilador cuando esté desmontando el chasis. El ventilador podría estar girando a gran velocidad.

Electrical dangers

DANGER

For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.

GEFAHR	Aus Sicherheitsgründen sollte ein EGB-Armband zum Schutz von elektronischen gefährdeten Bauelementen mit einem 1 Megaohm-Reihenwiderstand ausgestattet sein.
DANGER	Pour des raisons de sécurité, la dragonne ESD doit contenir une résistance de série 1 méga ohm.

PELIGRO	Por razones de seguridad, la correa de muñeca ESD deberá contener un resistor en serie de 1 mega ohmio.

DANGER

Make sure that the power source circuits are properly grounded, then use the power cord supplied with the device to connect it to the power source.

GEFAHR	Stellen Sie sicher, dass die Stromkreise ordnungsgemäß geerdet sind. Benutzen Sie dann das mit dem Gerät gelieferte Stromkabel, um es an die Srromquelle anzuschließen.
DANGER	Vérifiez que les circuits de sources d'alimentation sont bien mis à la terre, puis utilisez lecordon d'alimentation fourni avec le dispositif pour le connecter à la source d'alimentation.
PELIGRO	Verifique que circuitos de la fuente de corriente están conectados a tierra correctamente; luego use el cordón de potencia suministrado con el instrumento para conectarlo a la fuente de corriente

DANGER

Remove both power cords before servicing.

GEFAHR	Trennen Sie beide Netzkabel, bevor Sie Wartungsarbeiten durchführen.
DANGER	Retirez les deux cordons d'alimentation avant toute maintenance.
PELIGRO	Desconecte ambos cables de alimentación antes de realizar reparaciones.

DANGER

Disconnect the power cord from all power sources to completely remove power from the device.

GEFAHR	Ziehen Sie das Stromkabel aus allen Stromquellen, um sicherzustellen, dass dem Gerät kein Strom zugeführt wird.
DANGER	Débranchez le cordon d'alimentation de toutes les sources d'alimentation pour couper complètement l'alimentation du dispositif.
PELIGRO	Para desconectar completamente la corriente del instrumento, desconecte el cordón de corriente de todas las fuentes de corriente.

DANGER

To avoid high voltage shock, do not open the device while the power is on.

GEFAHR	Das eingeschaltete Gerät darf nicht geöffnet werden, da andernfalls das Risiko eines Stromschlags mit Hochspannung besteht.
DANGER	Afin d'éviter tout choc électrique, n'ouvrez pas l'appareil lorsqu'il est sous tension.
PELIGRO	Para evitar una descarga de alto voltaje, no abra el dispositivo mientras esté encendido.

DANGER

Batteries used for RTC/NVRAM backup are not located in operator-access areas. There is a risk of explosion if a battery is replace by an incorrect type. Dispose of used components with batteries according to local ordinance and regulations.

GEFAHR	Die für die RTC/NVRAM-Sicherung verwendeten Batterien, befinden sich nicht in für den Bediener zugänglichen Bereichen. Bei Ersetzen der Batterie durch einen falschen Typ besteht Explosionsgefahr. Entsorgen Sie gebrauchte Komponenten mit Batterien gemäß den lokalen Auflagen und Vorschriften.
DANGER	Les batteries utilisées pour la sauvegarde de l'horloge et de la mémoire ne sont pas remplaçables par l'opérateur. Il y a risque d'explosion si la batterie est remplacée par une d'un type incompatible. Jetez/recyclez les batteries conformément aux normes locales.
PELIGRO	Las baterías usadas para respaldo de RTC/NVRAM no se encuentran en areas de acceso del operador. Existe riesgo de explosión si una batería es remplazada por un tipo incorrecto. Deshágase de los componentes usados con las baterías según las politicas y regulaciones locales.

Dangers related to equipment weight

DANGER

Make sure the rack housing the device is adequately secured to prevent it from becoming unstable or falling over.

GEFAHR	Stellen Sie sicher, dass das Gestell für die Unterbringung des Geräts auf angemessene Weise gesichert ist, so dass das Gestell oder der Schrank nicht wackeln oder umfallen kann.
DANGER	Vérifiez que le bâti abritant le dispositif est bien fixé afin qu'il ne devienne pas instable ou qu'il ne risque pas de tomber.
PELIGRO	Verifique que el bastidor que alberga el instrumento está asegurado correctamente para evitar que pueda hacerse inestable o que caiga.

Laser dangers

DANGER

All fiber-optic interfaces use Class 1 lasers.

GEFAHR	Alle Glasfaser-Schnittstellen verwenden Laser der Klasse 1.
DANGER	Toutes les interfaces en fibre optique utilisent des lasers de classe 1.
PELIGRO	Todas las interfaces de fibra óptica utilizan láser de clase 1.

Cautions

A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

Ein Vorsichthinweis warnt Sie vor potenziellen Personengefahren oder Beschädigung der Hardware, Firmware, Software oder auch vor einem möglichen Datenverlust

Un message de mise en garde vous alerte sur des situations pouvant présenter un risque potentiel de dommages corporels ou de dommages matériels, logiciels ou de perte de données.

Un mensaje de precaución le alerta de situaciones que pueden resultar peligrosas para usted o causar daños en el hardware, el firmware, el software o los datos.

General cautions

CAUTION

Changes or modifications made to this device that are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

VORSICHT	Falls dieses Gerät verändert oder modifiziert wird, ohne die ausdrückliche Genehmigung der für die Einhaltung der Anforderungen verantwortlichen Partei einzuholen, kann dem Benutzer der weitere Betrieb des Gerätes untersagt werden.
MISE EN GARDE	Les éventuelles modifications apportées à cet équipement sans avoir été expressément approuvées par la partie responsable d'en évaluer la conformité sont susceptibles d'annuler le droit de l'utilisateur à utiliser cet équipement.
PRECAUCIÓN	Si se realizan cambios o modificaciones en este dispositivo sin la autorización expresa de la parte responsable del cumplimiento de las normas, la licencia del usuario para operar este equipo puede quedar anulada.

CAUTION
Do not install the device in an environment where the operating ambient temperature might exceed 40°C (104°F).

VORSICHT	Das Gerät darf nicht in einer Umgebung mit einer Umgebungsbetriebstemperatur von über 40°C (104°F) installiert werden.
MISE EN GARDE	N'installez pas le dispositif dans un environnement où la température d'exploitation ambiante risque de dépasser 40°C (104°F).
PRECAUCIÓN	No instale el instrumento en un entorno en el que la temperatura ambiente de operación pueda exceder los 40°C (104°F).

CAUTION
Make sure the airflow around the front, and back of the device is not restricted.

VORSICHT	Stellen Sie sicher, dass an der Vorderseite, den Seiten und an der Rückseite der Luftstrom nicht behindert wird.
MISE EN GARDE	Vérifiez que rien ne restreint la circulation d'air devant, derrière et sur les côtés du dispositif et qu'elle peut se faire librement.
PRECAUCIÓN	Asegúrese de que el flujo de aire en las inmediaciones de las partes anterior, laterales y posterior del instrumento no esté restringido.

Electrical cautions

CAUTION
Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.

VORSICHT	Bevor Sie ein Kabel in einen Anschluss einstecken, entladen Sie jegliche im Kabel vorhandene elektrische Spannung, indem Sie mit den elektrischen Kontakten eine geerdete Oberfläche berühren.
MISE EN GARDE	Avant de brancher un câble à un port, assurez-vous de décharger la tension du câble en reliant les contacts électriques à la terre.
PRECAUCIÓN	Antes de conectar un cable en cualquier puerto, asegúrese de descargar la tensión acumulada en el cable tocando la superficie de conexión a tierra con los contactos eléctricos.

CAUTION
Static electricity can damage the chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

VORSICHT	Statische Elektrizität kann das System und andere elektronische Geräte beschädigen. Um Schäden zu vermeiden, entnehmen Sie elektrostatisch empfindliche Geräte erst aus deren antistatischer Schutzhülle, wenn Sie bereit für den Einbau sind.
MISE EN GARDE	L'électricité statique peut endommager le châssis et les autres appareils électroniques. Pour éviter tout dommage, conservez les appareils sensibles à l'électricité statique dans leur emballage protecteur tant qu'ils n'ont pas été installés.
PRECAUCIÓN	La electricidad estática puede dañar el chasis y otros dispositivos electrónicos. A fin de impedir que se produzcan daños, conserve los dispositivos susceptibles de dañarse con la electricidad estática dentro de los paquetes protectores hasta que esté listo para instalarlos.

CAUTION
If you do not install a module or a power supply in a slot, you must keep the slot filler panel in place. If you run the chassis with an uncovered slot, the system will overheat.

VORSICHT	Falls kein Modul oder Netzteil im Steckplatz installiert wird, muss die Steckplatztafel angebracht werden. Wenn ein Steckplatz nicht abgedeckt wird, läuft das System heiß.

MISE EN GARDE	Si vous n'installez pas de module ou de bloc d'alimentation dans un slot, vous devez laisser le panneau du slot en place. Si vous faites fonctionner le châssis avec un slot découvert, le système surchauffera.
PRECAUCIÓN	Si no instala un módulo o un fuente de alimentación en la ranura, deberá mantener el panel de ranuras en su lugar. Si pone en funcionamiento el chasis con una ranura descubierta, el sistema sufrirá sobrecalentamiento.

CAUTION

Carefully follow the mechanical guides on each side of the power supply slot and make sure the power supply is properly inserted in the guides. Never insert the power supply upside down.

VORSICHT	Beachten Sie mechanischen Führungen an jeder Seite des Netzteils, das ordnungegemäß in die Führungen gesteckt werden muss. Das Netzteil darf niemals umgedreht eingesteckt werden.
MISE EN GARDE	Suivez attentivement les repères mécaniques de chaque côté du slot du bloc d'alimentation et assurez-vous que le bloc d'alimentation est bien inséré dans les repères. N'insérez jamais le bloc d'alimentation à l'envers.
PRECAUCIÓN	Siga cuidadosamente las guías mecánicas de cada lado de la ranura del suministro de energía y verifique que el suministro de energía está insertado correctamente en las guías. No inserte nunca el suministro de energía de manera invertida.

CAUTION

The power supply switch must be in the off position when you insert the power supply into the chassis. Damage to the switch can result if a live power supply is installed.

VORSICHT	Der Schalter des Netzteils muss in der Stellung „Aus" stehen, wenn das Netzteil in das Gehäuse eingesetzt wird. Wenn ein spannungsführendes Netzteil (Schalterstellung "Ein") eingebaut wird, kann dies zu Beschädigungen am Switch führen.
MISE EN GARDE	Le commutateur d'alimentation doit être en position d'arrêt lorsque vous insérez la source d'alimentation dans le châssis. Si une source d'alimentation sous tension est installée, des dommages peuvent être causés.
PRECAUCIÓN	El interruptor de la fuente de alimentación debe estar en la posición de apagado en el momento de introducirla en el chasis. El conmutador puede resultar dañado si se instala una fuente de alimentación activa.

CAUTION

All devices with DC power supplies are intended for installation in restricted access areas only. A restricted access area is a location where access can be gained only by trained service personnel through the use of a special tool, lock and key, or other means of security, and is controlled by the authority responsible for the location.

VORSICHT	Alle Geräte mit DC-Netzteil sind nur für die Installation in Bereichen mit beschränktem Zugang gedacht. Ein Bereich mit beschränktem Zugang ist ein Ort, zu dem nur ausgebildetes Wartungspersonal mit Spezialwerkzeug, Schloss und Schlüssel oder anderen Sicherheitsvorrichtungen Zugang hat. Dieser Zugang wird von für den Bereich zuständigen Personen überwacht.
MISE EN GARDE	Tous les équipements dotés de sources d'alimentation C.C. sont destinés à être installés uniquement dans des zones à accès réglementé. Une zone à accès réglementé est une zone dont l'accès n'est possible qu'au personnel de service qualifié utilisant un verrou, une clé ou un outil spécial, ou d'autres moyens de sécurité, et qui est contrôlée par les autorités responsables du site.
PRECAUCIÓN	Todos los dispositivos con fuentes de alimentacion de corriente continua (CC) han sido diseñados únicamente para su instalación en áreas restringidas/ zonas de acceso restringido . Se entiende como área de acceso restringido un lugar al que solo puede acceder personal de servicio mediante el uso de una herramienta especial, llave y cerrojo u otro medio de seguridad similar, y que esté controlado por la autoridad responsable de esa ubicación.

CAUTION

For the DC input circuit to the system, make sure there is a 10 Amp circuit breaker, maximum 60 VDC, double pole, on the input terminal block to the power supply. The input wiring for connection to the product should be copper wire, 16 AWG, marked VW-1, and rated minimum 90°C.

VORSICHT	Für den Eingangs-Gleichstromkreis zum System ist ein 10 A, maximum -60 V DC, doppelpoliger Stromkreisunterbrecher am Eingang zur Reihenklemme zu installieren. Bei der Eingangsverdrahtung zum Anschluss des Produkts sollte es sich um einen 16 AWG-Kupferdraht (VW-1) und einer Mindestnenntemperatur von 90° C handeln.

MISE EN GARDE	Pour le circuit d'alimentation C.C du système, assurez-vous de la présence d'un disjoncteur de 10 ampères, minimum -60 V C.C., double coupure, sur l'entrée vers le bloc d'alimentation. Les câbles d'alimentation pour le produit doivent être en fils de cuivre, 16 AWG (American Wire Gauge), marqués VW-1 et classés 90 degrés Celsius.
PRECAUCIÓN	Para el circuito de entrada de CC al sistema, verifique que existe un cortacircuitos catalogado de 10 amperios, como mínimo, -60 VCC, bipolar, en la entrada al bloque terminal. El cableado de entrada para la conexión al producto deberá ser de cable de cobre catalogado, 16 AWG, marcado con VW-1, y tener una capacidad nominal mínima para 90 grados centígrados.

CAUTION

For a DC system, use grounding wire of at least 16 American Wire Gauge (AWG). The grounding wire should be attached to the DC input connector; the other end connects to the building ground.

VORSICHT	Für ein Gleichstromsystem verwenden Erdungskabel von mindestens 16 AWG (1.31 mm2) (amerikanische Norm für Drahtquerschnitte). Der Erdungsdraht sollte DC-Eingang angeschlossen werden, das andere Ende verbindet sich mit dem Baugrund.
MISE EN GARDE	Pour les systèmes d'alimentation courant continu (C.C), utilisez un fil de mise à terre d'au moins de 16 AWG (ou 1.31mm2). Le fil de mise à terre doit être relié au connecteur du circuit d'alimentation; l'autre extrémité se connecte à la prise terre du batiment.
PRECAUCIÓN	Para un sistema de CC, usar alambre de puesta a tierra de por lo menos 16 AWG (American Wire Gauge). El cable de tierra debe ser conectada a enchufe CC; el otro extremo se conecta a la tierra del edificio.

CAUTION

DC return shall be isolated from the chassis ground (DC-I) when connections to the power supply are made.

VORSICHT	Der Gleichstromrücklauf soll von der Gehäuseerdung isoliert werden (DC-I), wenn Verbindungen zur Stromversorgung hergestellt werden.
MISE EN GARDE	La prise de terre de courant continu (CC) doit être isolée de la masse (CC-I) lorsqu'elle est connectée au bloc d'alimentation.
PRECAUCIÓN	El retorno de CC debe estar aislado de la toma de tierra de chasis (CC-I) cuando se realicen conexiones con la fuente de alimentación.