BROCADE
A Broadcom Limited Company

Brocade 6520 Hardware Installation Guide

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Contents

About This Document

Supported hardware and software

This document includes information specific to the Brocade 6520 running Brocade Fabric OS version 7.1.0. and later.

What's new in this document

This section lists items in this document that are new or significantly revised from preceding version.

- Modified battery danger statement in RTC battery precautions on page 16.
- Removed "In-band support" column from "Management Options for the Brocade 6520 Switch" table in Brocade 6520 management on page 14 as this no longer applies to Brocade products.
- Editorial revisions in rack mount kit procedures.

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.
	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.

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.

Send your feedback to documentation.pdl@broadcom.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.

Device Overview

Brocade 6520 overview

The Brocade 6520 is a 96-port auto-sensing 2, 4, 8, or 16 Gbps, as well as 10 Gbps, Fibre Channel (FC) switch that delivers the latest Brocade multi-chip architecture for Fibre Channel Storage Area Networks (SANs). The Brocade 6520 is an enterprise-class switch that is designed to handle the large-scale SAN requirements of an enterprise, and can also be used to address the SAN requirements of a small to medium-sized workgroup.

The Brocade 6520 provides up to 96 ports in a double height (2U) switch that enables the creation of very dense fabrics in a relatively small space.

The Brocade 6520 offers Ports on Demand (POD) licensing as well. "Base" models of the switch contain 48 ports, and up to two additional 24-port POD licenses can be purchased to fill all 96 ports.

Port activation works through a process called Dynamic Ports on Demand (DPOD). With DPOD, ports are licensed as they come online. For instance, if you have a base model with 48 port licenses, the first 48 ports to come online, regardless of their numbering, are licensed. Once all the licenses have been assigned, you can manually move those licenses from one port to another if you choose.

The first eight ports can be configured to run at 10 Gbps with the appropriate licensing.

The Brocade 6520 supplies Reliability, Availability, and Serviceability (RAS) performance and scalability requirements of an enterprise switch along with interoperability and ease-of-use advantages.

The Brocade 6520 is only 24 inches deep and has airflow direction options. You can order either port side exhaust (the default configuration) or non-port side exhaust airflow to accommodate specific installations.

Brocade 6520 features and capabilities

The Brocade 6520 offers the following features and capabilities:

- Up to 96 auto-sensing ports of high-performance 16 Gbps technology in a single domain.
- Ports on Demand scaling from 48 to 72 or 96 ports.
- Port licensing via DPOD
- 2, 4, 8, and 16 Gbps auto-sensing Fibre Channel switch and router ports.
  - 2, 4, and 8 Gbps performance is enabled by 8 Gbps SFP+ transceivers.
  - 4, 8, and 16 Gbps performance is enabled by 16 Gbps SFP+ transceivers.
- 10 Gbps manual set capability on FC ports (requires the optional 10 Gigabit FCIP/Fibre Channel license) on the first eight ports only.
  - Ports can be configured for 10 Gbps for metro connectivity.
  - 10 Gbps performance is enabled by 10 Gbps Fibre Channel SFP+ transceivers.

- FC ports will self-configure as E_ports and F_ports. EX_ports can be activated on a per-port basis with the optional Integrated Routing license.
  - Mirror ports (M_ports) and diagnostic ports (D_ports) must be manually configured.
  - The Brocade Diagnostic Port (D_port) feature provides physical media diagnostic, troubleshooting, and verification services.
- In-flight data compression and encryption on up to 16 ports (up to 8 ports at 16 Gbps) provides efficient link utilization and security.
- Options for port side exhaust (default) or non-port side exhaust airflow for cooling.
- Virtual Fabric (VF) support to improve isolation between different VFs.
- Fibre Channel Routing (FCR) service, available with the optional Integrated Routing license, provides improved scalability and fault isolation.
- Inter-Switch Link (ISL) Trunking (licensable), which allows up to eight ports (at 2, 4, 8, or 16 Gbps speeds) between a pair of switches combined to form a single, logical ISL with a speed of up to 128 Gbps (256 Gbps full duplex) for optimal bandwidth utilization and load balancing. There is no limit to how many trunk groups can be configured.
- Dynamic Path Selection (DPS), which optimizes fabric-wide performance and load balancing by automatically routing data to the most efficient available path in the fabric.
- Brocade-branded SFP+ optical transceivers that support any combination of Short Wavelength (SWL) and Long Wavelength (LWL) or Extended Long Wavelength (ELWL) optical media among the switch ports.
- Extended distance support enables native Fibre Channel extension up to 7,500 km at 2 Gbps.
- Support for unicast, multicast (255 groups), and broadcast data traffic types.
- Brocade Fabric OS, which delivers distributed intelligence throughout the network and enables a wide range of value-added applications including Brocade Advanced Web Tools and Brocade Zoning. Optional Fabric Services include Adaptive Networking with QoS, Brocade Extended Fabrics, Brocade Enhanced Group Management, Brocade Fabric Watch, ISL Trunking, and End-to-End Advanced Performance Monitoring (APM).
- Hardware zoning is accomplished at the port level of the switch and by World Wide Name (WWN). Hardware zoning permits or denies delivery of frames to any destination port address.
- Extensive diagnostics and system-monitoring capabilities for enhanced high Reliability, Availability, and Serviceability (RAS).
- 10Gbps Fibre Channel integration on the same port provides for DWDM metro connectivity on the same switch (can be done on first eight ports only with appropriate licensing).
- The Brocade EZSwitchSetup wizard that makes SAN configuration a three-step point-and-click task.
- Real-time power monitoring enables users to monitor real-time power usage of the fabric at a switch level.
- Local port latency minimized to 700 nanoseconds (ns) through the use of cut-through frame routing at 16 Gbps.
- Switch latency of 2100 ns (L2 latency without forward error correction)

Brocade 6520 components

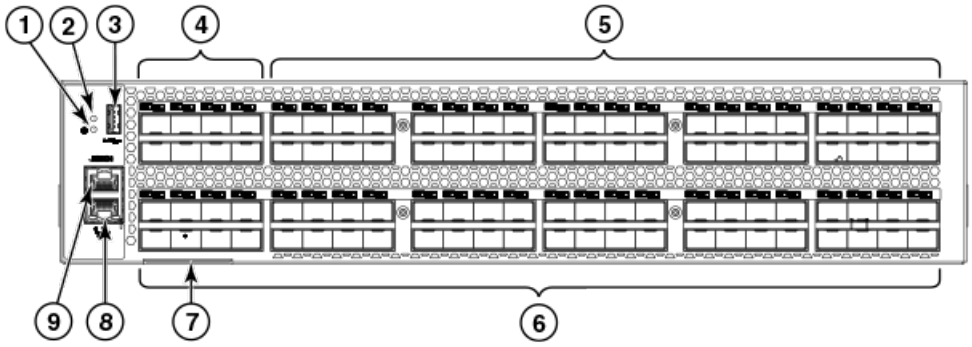
- A system motherboard that features a primary CPU running at 1.20 GHz, with integrated peripherals.
- One 2 GB DDR2 running at 400 MHz.
- Boot memory of 8 MB.
- One 2 GB compact flash card.
- Up to 96 16 Gbps Fibre Channel ports.

- An RJ45 10/100/1000 BaseT Ethernet system management port (RJ45 connector), in conjunction with EZSwitchSetup, that supports switch IP address discovery and configuration, eliminating the need to attach a serial cable to configure the switch IP address.
- One RS-232 console (serial) port with an RJ45 connector for initial switch setup (if not using EZSwitchSetup) and factory default restoration.
- One USB 2.0 port that provides storage for firmware updates, output of the **supportSave** command, and storage for configuration uploads and downloads.
- Two hot-swappable, 80+ Platinum certified, redundant power supplies.
- Three hot-swappable fan FRUs.
- One LED (green/amber) per FC port to indicate status.
- One LED (green) for system power.
- One LED (green/amber) for system status.
- Two Ethernet LEDs (integrated with RJ45) for speed and activity status.
- Two LEDs per power supply: one green for AC line in status and one green/amber for DC power out.
- One LED (green/amber) per fan.
- SEEPROM for switch identification.
- Voltage monitoring.
- Fan monitoring including flow direction.
- Temperature monitoring.
- Real-time clock (RTC) with battery.

Port side of the Brocade 6520

The port side of the Brocade 6520 includes the system status LED, console port, Ethernet port and LEDs, USB port, and Fibre Channel ports and the corresponding port status LEDs.

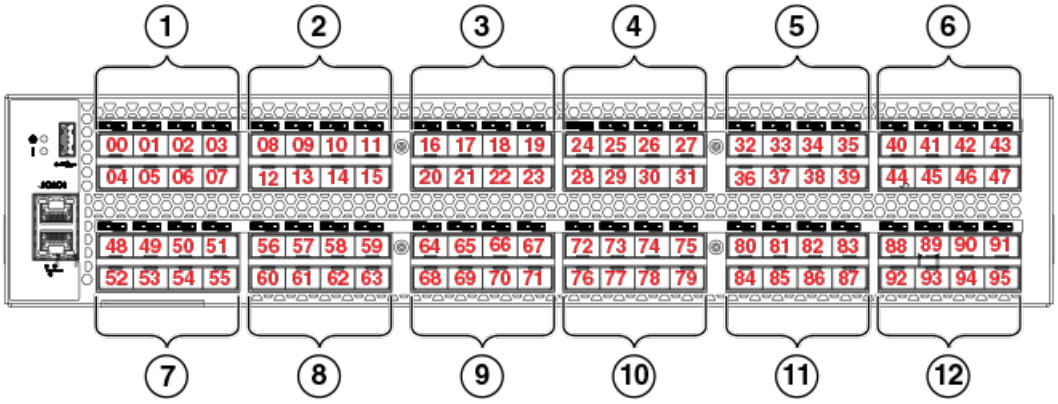
FIGURE 1 Port side view of the Brocade 6520



1. System power LED
2. System status LED
3. USB port

4. FC ports 0-7 (all LEDs above)
5. FC ports 8-47
6. FC ports 48-95
7. Switch ID pull-out tab
8. Management Ethernet port with LEDs
9. Serial console port

FIGURE 2 Trunking port groups and port numbers of the Brocade 6520

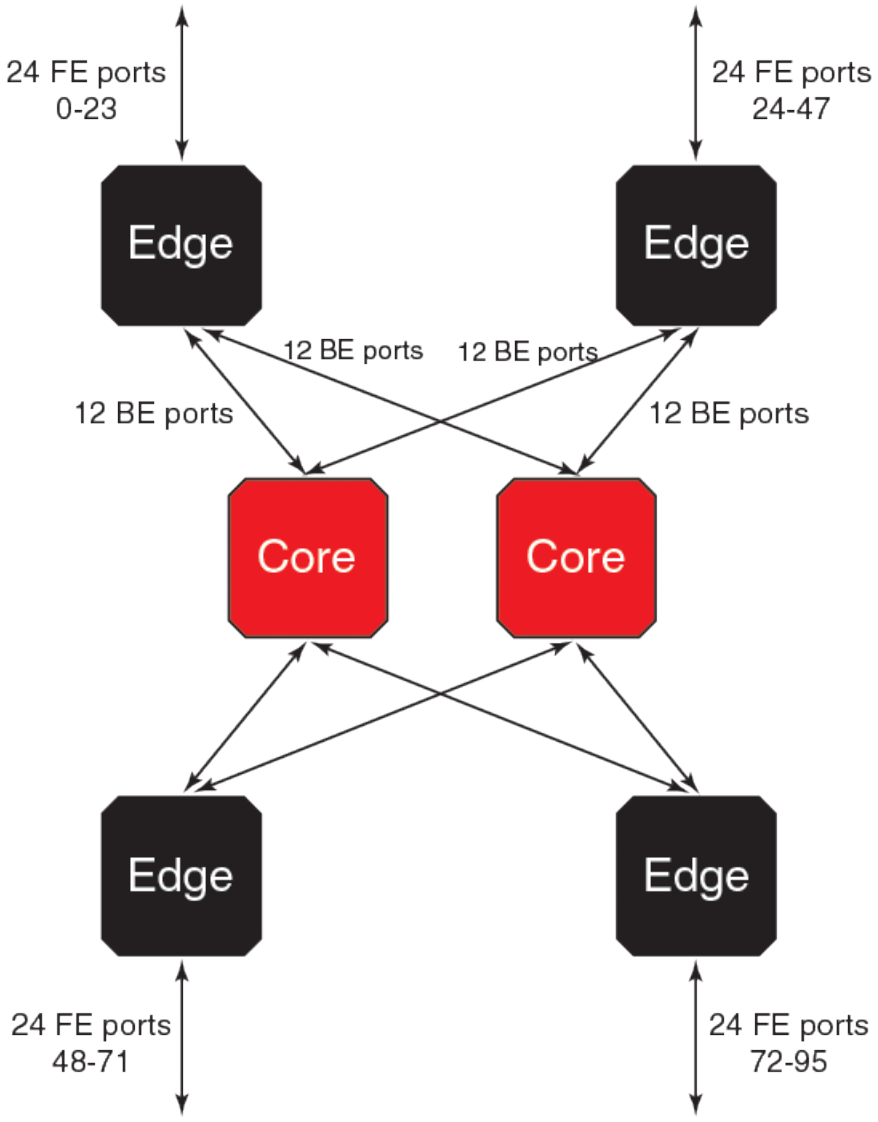


1. Trunking port group 1: FC ports 00-07
2. Trunking port group 2: FC ports 08-15
3. Trunking port group 3: FC ports 16-23
4. Trunking port group 4: FC ports 24-31
5. Trunking port group 5: FC ports 32-39
6. Trunking port group 6: FC ports 40-47
7. Trunking port group 7: FC ports 48-55
8. Trunking port group 8: FC ports 56-63
9. Trunking port group 9: FC ports 64-71
10. Trunking port group 10: FC ports 72-79
11. Trunking port group 11: FC ports 80-87
12. Trunking port group 12: FC ports 88-95

NOTE

You can also use port index and PIDs to identify a port. For more information, refer to the *Fabric OS Administrator's Guide*.

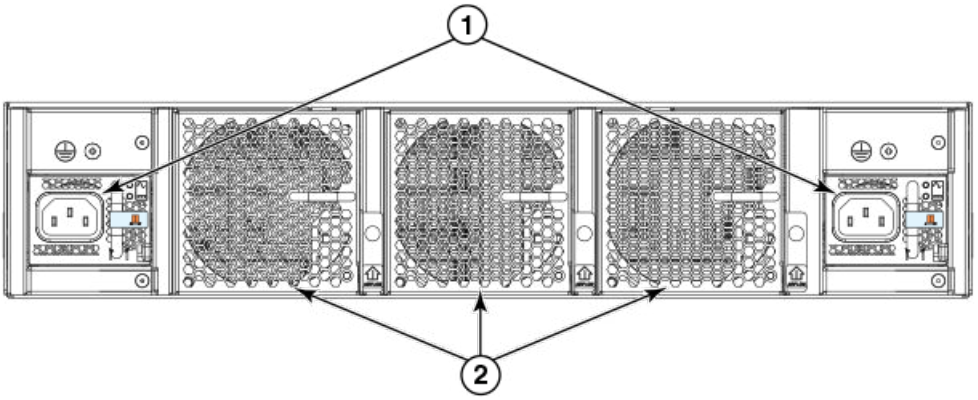
FIGURE 3 Trunking port groups to internal ASIC mapping of the Brocade 6520



Non-port side of the Brocade 6520

The following figure shows the non-port side of the Brocade 6520, which contains the power supplies (including the AC power receptacle and AC power switch) and fans.

FIGURE 4 Non-port side of the Brocade 6520



1. Power supplies with integral fans
2. Fans

Brocade 6520 management

You can use the management functions built into the Brocade 6520 to monitor the fabric topology, port status, physical status, and other information to help you analyze switch performance and to accelerate system debugging.

The Brocade 6520 automatically performs power-on self-test (POST) each time it is turned on. Any errors are recorded in the system error log. For more information about POST, refer to POST and boot-up specifications on page 66.

For information about upgrading the version of Fabric OS installed on your switch, refer to the *Brocade Fabric OS Administration Guide*.

You can manage the Brocade 6520 using any of the management options listed in Table 1. Refer to the *Brocade Fabric OS Command Reference* for more information on the CLI commands.

TABLE 1 Management options for the Brocade 6520

Management tool	Out-of-band support
Command line interface (CLI) Up to two admin sessions and four user sessions simultaneously. For more information, refer to the *Brocade Fabric OS Administration Guide* and the *Brocade Fabric OS Command Reference*.	Ethernet or serial connection
Brocade Web Tools For information, refer to the *Brocade Web Tools Administration Guide*.	Ethernet or serial connection
Standard SNMP applications For information, refer to the *Brocade Fabric OS Administration Guide*.	Ethernet or serial connection
Management Server For information, refer to the *Brocade Fabric OS Administration Guide* and the*Brocade Fabric OS Command Reference*.	Ethernet or serial connection
Brocade Network Advisor (option to purchase) For information, refer to the Brocade Network Advisor documentation set.	Ethernet or serial connection

Preparing for Installation

General precautions

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

NOTE

Refer to Caution and Danger Notices on page 91 for translations of safety notices for this product.

DANGER

The procedures in this manual are for qualified service personnel.

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.

DANGER

Use only optical transceivers that are qualified by Brocade Communications Systems LLC 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.

ESD precautions

The Brocade 6520 contains electrostatic discharge (ESD) sensitive FRUs. When working with any Brocade 6520 FRU, use correct ESD procedures.

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.

Wear a wrist grounding strap connected to chassis ground (if the Brocade 6520 is plugged in) or a bench ground.

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

Electrical considerations

To install and operate the switch successfully, ensure the compliance with the following requirements:

- The primary outlets are correctly wired, protected by a circuit breaker, and grounded in accordance with local electrical codes.

  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.

- The supply circuit, line fusing, and wire size are adequate, as specified by the electrical rating on the switch nameplate.
- This switch might have more than one power cord. To reduce the risk of electric shock, disconnect both power cords before servicing.

  DANGER
  Remove both power cords before servicing.

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

- This product is designed for an IT power system with phase-to-phase voltage of 230V. After operation of the protective device, the equipment is still under voltage if it is connected to an IT power system.

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

- The power supply standards provided in Brocade 6520 Technical Specifications on page 0 are met.

RTC battery precautions

Do not attempt to replace the real-time clock (RTC) battery. There is danger of explosion if the battery is incorrectly replaced or disposed of. Contact your switch supplier if the real-time clock begins to lose time.

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 containing batteries according to the local ordinance and regulations.

Environmental considerations

For successful installation and operation of the switch, ensure that the following environmental requirements are met:

- At a minimum, adequate cooling requires that you install the switch with the intake side, as indicated by the airflow direction of the fan assemblies, facing the cool-air aisle. The **chassisshow** output indicates "Reverse" for non-port side intake and "Forward" for port side intake.
- All equipment in the rack should force air in the same direction to avoid intake of exhaust air.
- Airflow requirements outlined in Brocade 6520 Switch Technical Specifications on page 81 must be met. Note that the requirements differ based on the direction of the airflow.

  CAUTION
  Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

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

- Ensure temperature requirements are met.

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

Rack considerations

For successful installation and operation of the switch in a rack, ensure the following rack requirements are met:

- The rack must be a standard EIA rack.
- A rack space that is two rack units (2U) high; 8.90 cm (3.50 inches) high and 48.3 cm (19 inches) wide.
- There are three rack kit options that accommodate the Brocade 6520, a four-post fixed rack kit, a two-post Telco rack kit, and a four-post sliding rail rack kit. See their respective installation manuals for details.
- The equipment in the rack is grounded through a reliable branch circuit connection and maintains ground at all times. Do not rely on a secondary connection to a branch circuit, such as a power strip.
- Airflow and temperature requirements are met on an ongoing basis, particularly if the switch is installed in a closed or multirack assembly.
- The additional weight of the switch does not exceed the rack's weight limits or unbalance the rack in any way.
- The rack is secured to ensure stability in case of unexpected movement, such as an earthquake.

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

Recommendations for cable management

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 reduce potential tangling of the cables. The following list proveides some recommendations for cable management:

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 Velcro-style straps to secure and organize fiber-optic cables.

Items included with the Brocade 6520

The following items are included with the standard shipment of a fully-configured Brocade 6520. When you open the Brocade 6520 packaging, verify that these items are included in the package and that no damage has occurred during shipping:

- The Brocade 6520 switch, containing two power supplies and three fans (incorporating either non-port side exhaust or port side exhaust airflow as ordered)
- 16 Gbps, 10 Gbps, or 8 Gbps SFP+ transceivers for the Fibre Channel ports (speed and quantity as ordered)
- One accessory kit, containing the following items:
  - Serial cable with an RJ45 connector
  - Two 6 ft. power cords
  - Rubber feet, required for setting up the switch as a standalone unit
  - China ROHS Hazardous Toxic Substance Content Chart
  - Brocade Network Advisor v12.0 Eval PRO Instruction Download
  - Web Tools ReadMe First Guide

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

Mounting the Device

Mounting options

You can install the Brocade 6520 switch in the following ways:

- As a standalone unit on a flat surface.
- In an EIA rack using a four-post, fixed-position rack mount kit. The rack mount kit can be ordered from your switch retailer.
- In a two-post Telco rack using the mid-mount rack kit for switches. The mid-mount rack kit for switches can be ordered from your switch retailer.
- In an EIA rack using a four-post sliding rail rack mount kit. The sliding rail rack mount kit mount can be ordered from your switch retailer.

Standalone installation for a Brocade 6520

Perform the following steps to install the Brocade 6520 as a standalone unit.

1. Unpack the Brocade 6520 and verify the items listed on Items included with the Brocade 6520 on page 18. Verify the items are present and undamaged.
2. Apply the adhesive rubber feet. Applying the rubber feet onto the switch helps prevent the switch from sliding off the supporting surface.
   a) Clean the indentations at each corner of the bottom of the switch to ensure that they are free of dust or other debris that might lessen the adhesion of the feet.
   b) With the adhesive side against the chassis, place one rubber foot in each indentation and press into place.
3. Place the switch on a flat, sturdy surface.
4. Provide power to the switch as described in Providing power to the switch on page 55.

NOTE

Do not connect the switch to the network until the IP address is correctly set. For instructions on how to set the IP address, refer to Initial Setup and Verification on page 55

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.
- Before mounting your device, review any specific installation and facility requirements in this Hardware Installation Guide.
- 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

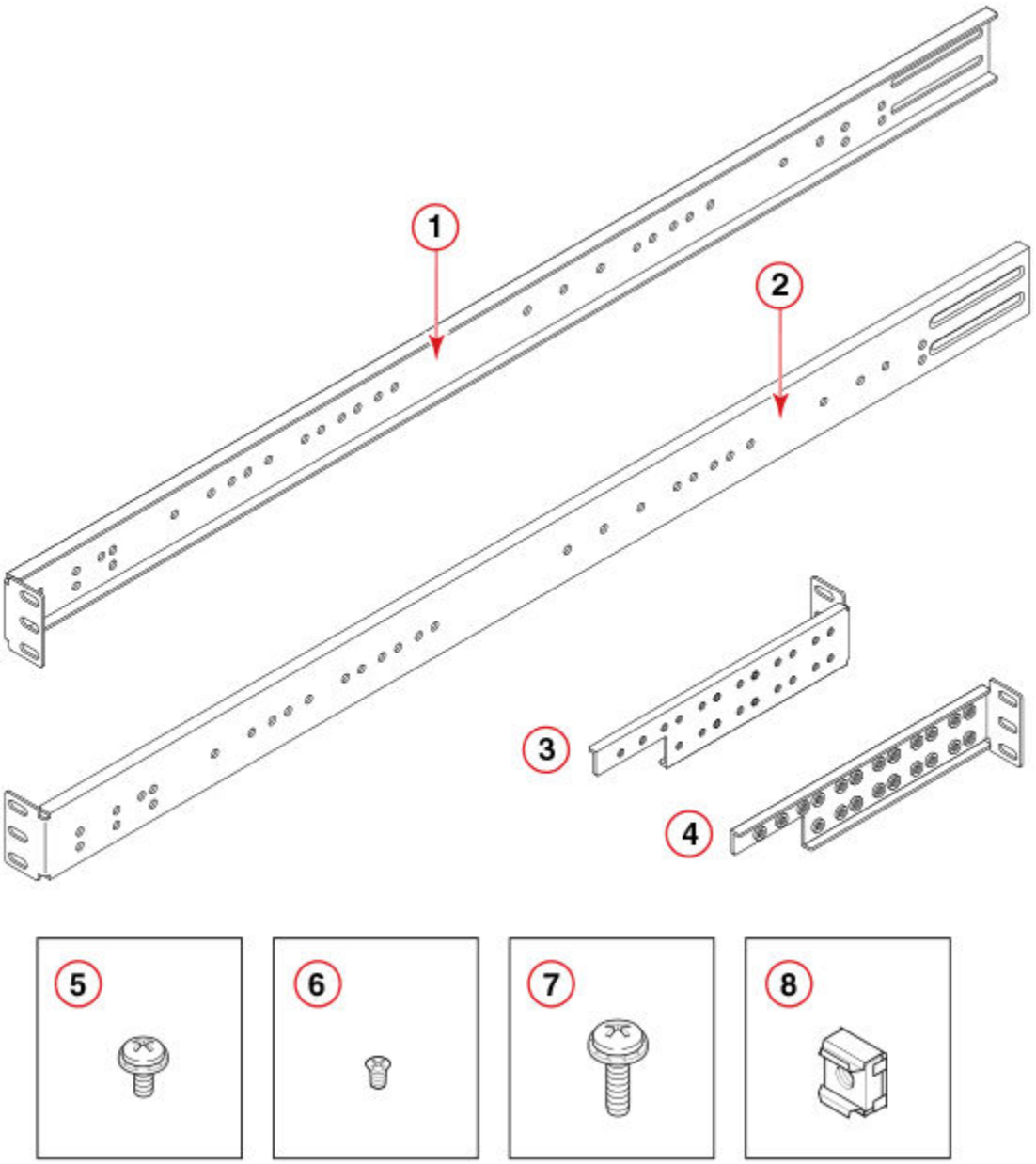
NOTE
You may need two people to install the device, one to support the device, while the other secures it into the rack.

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 5 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.

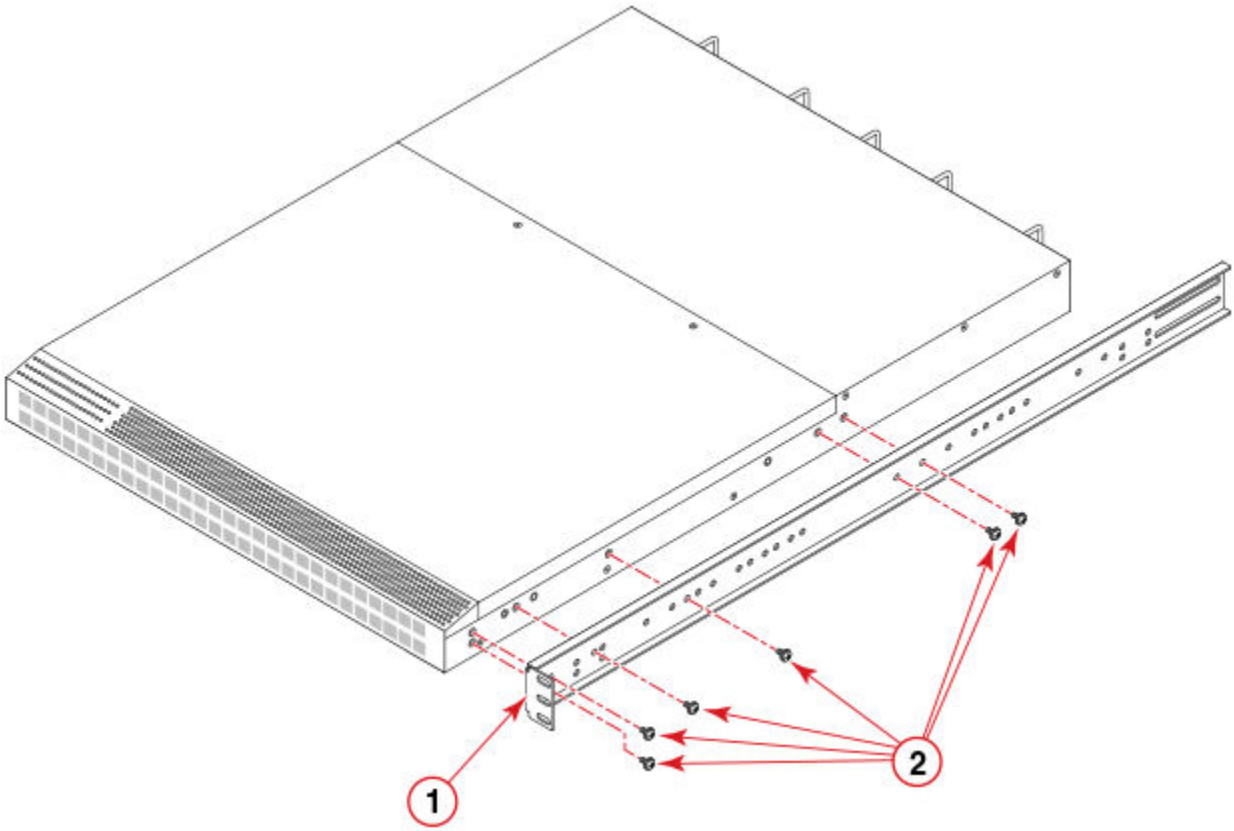
Attaching the front brackets

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 6 Attaching the front brackets



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

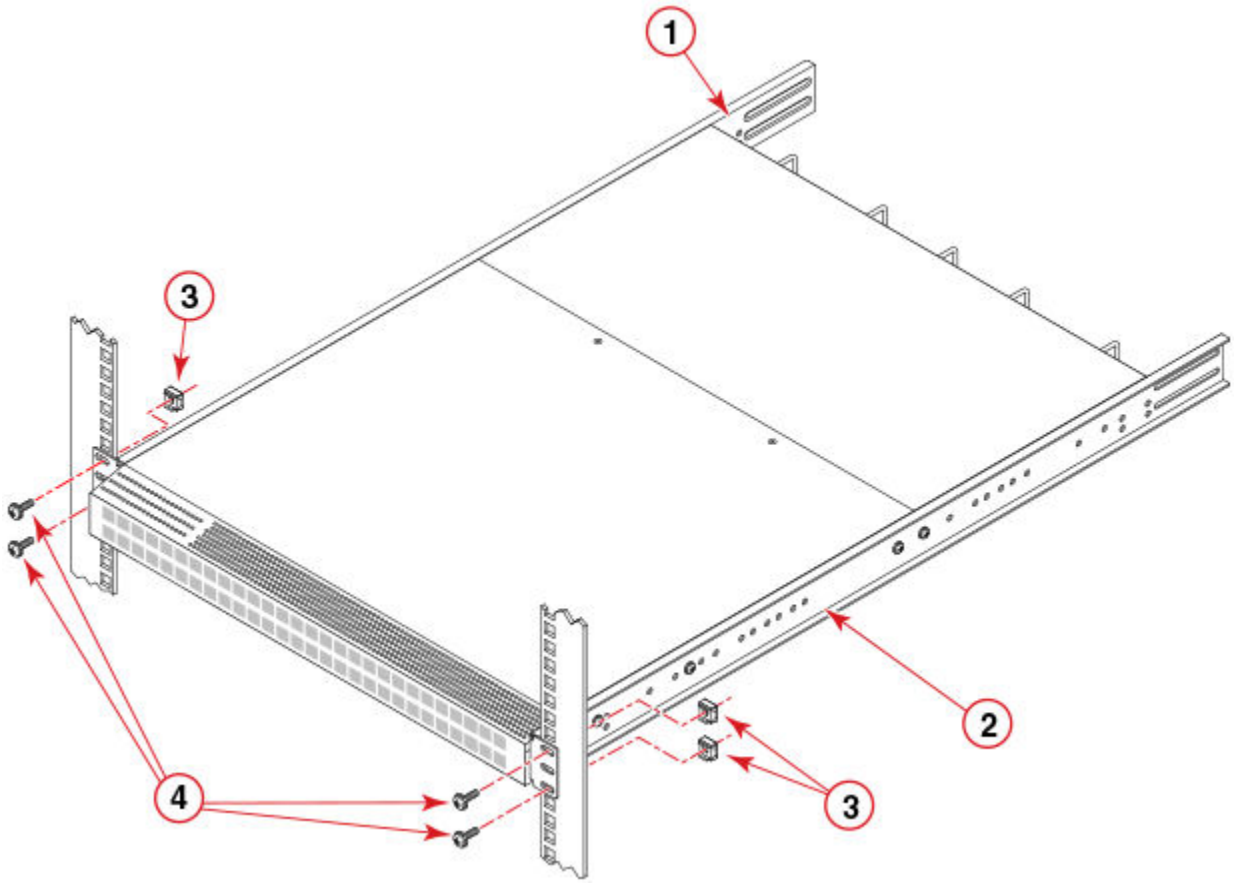
Installing the device in the rack

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 7 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.

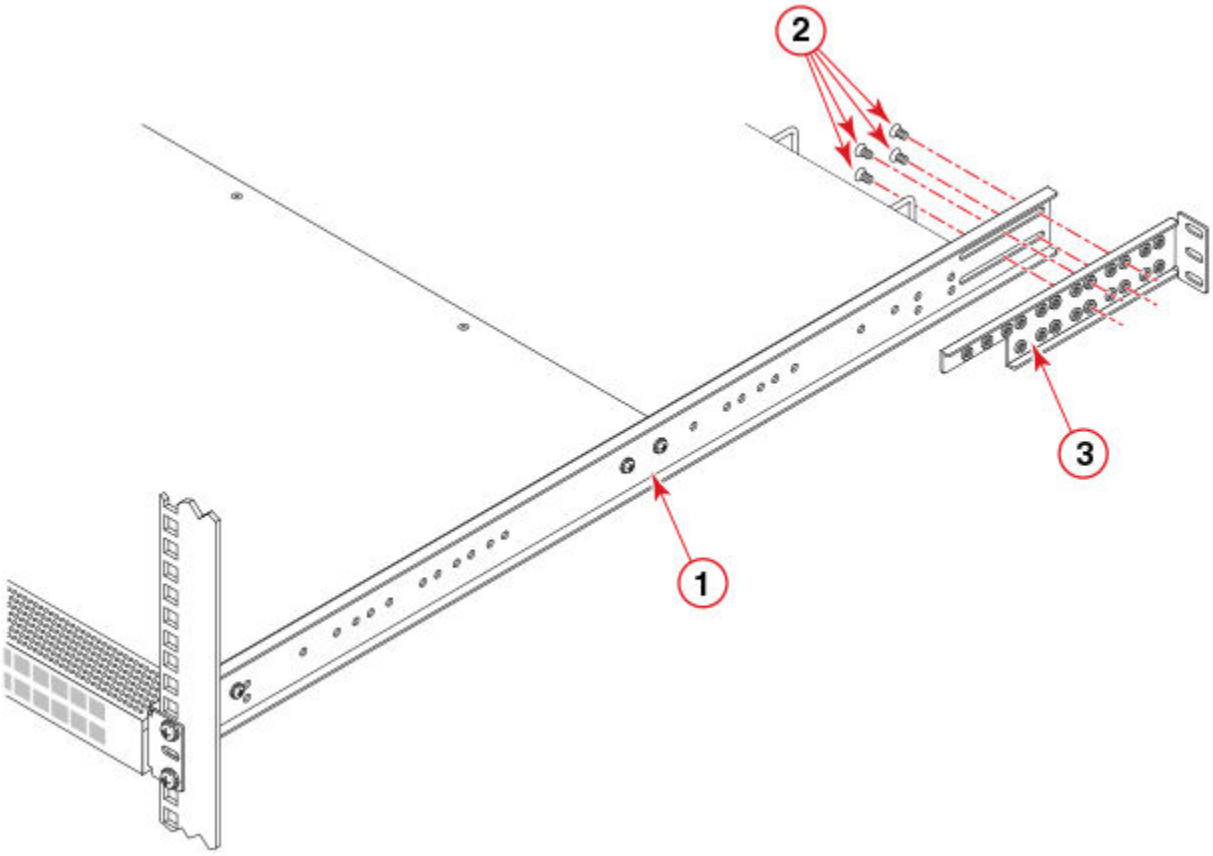
Attaching the rear brackets to the front brackets

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 8 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

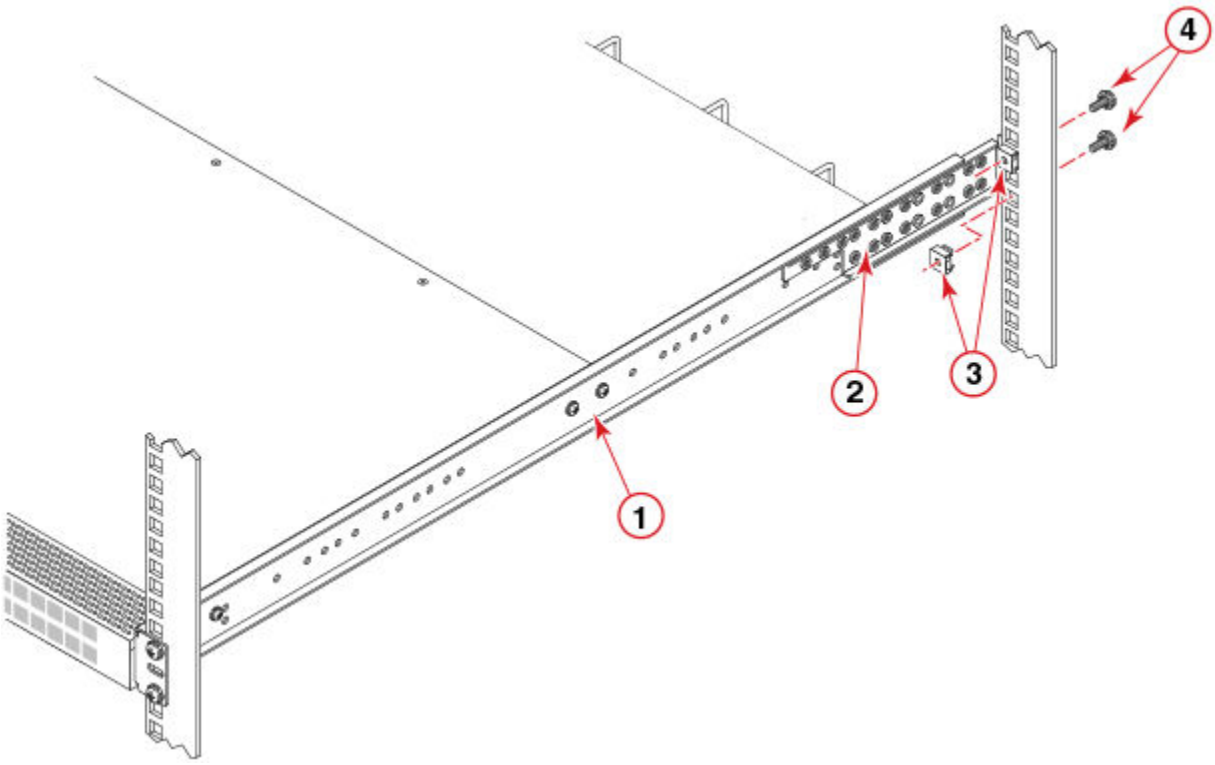
Attaching the rear brackets to the rack posts

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 9 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

Installing the 1U and 2U Flush-Mount Rack Kit for Two-Post Racks (XBR-000307 and XBR-R000293)

Use the following instructions to install a fixed-port device in a flush-mount configuration using the 1U and 2U Flush-Mount Rack Kit for Two-Post Racks (XBR-000307 and XBR-R000293).

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 in the rack.
- Before mounting your device, review any specific installation and facility requirements in this Hardware Installation Guide.
- 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 1U and 2U Flush-Mount Rack Kit for Two-Post Racks (XBR-000307 and XBR-R000293).

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

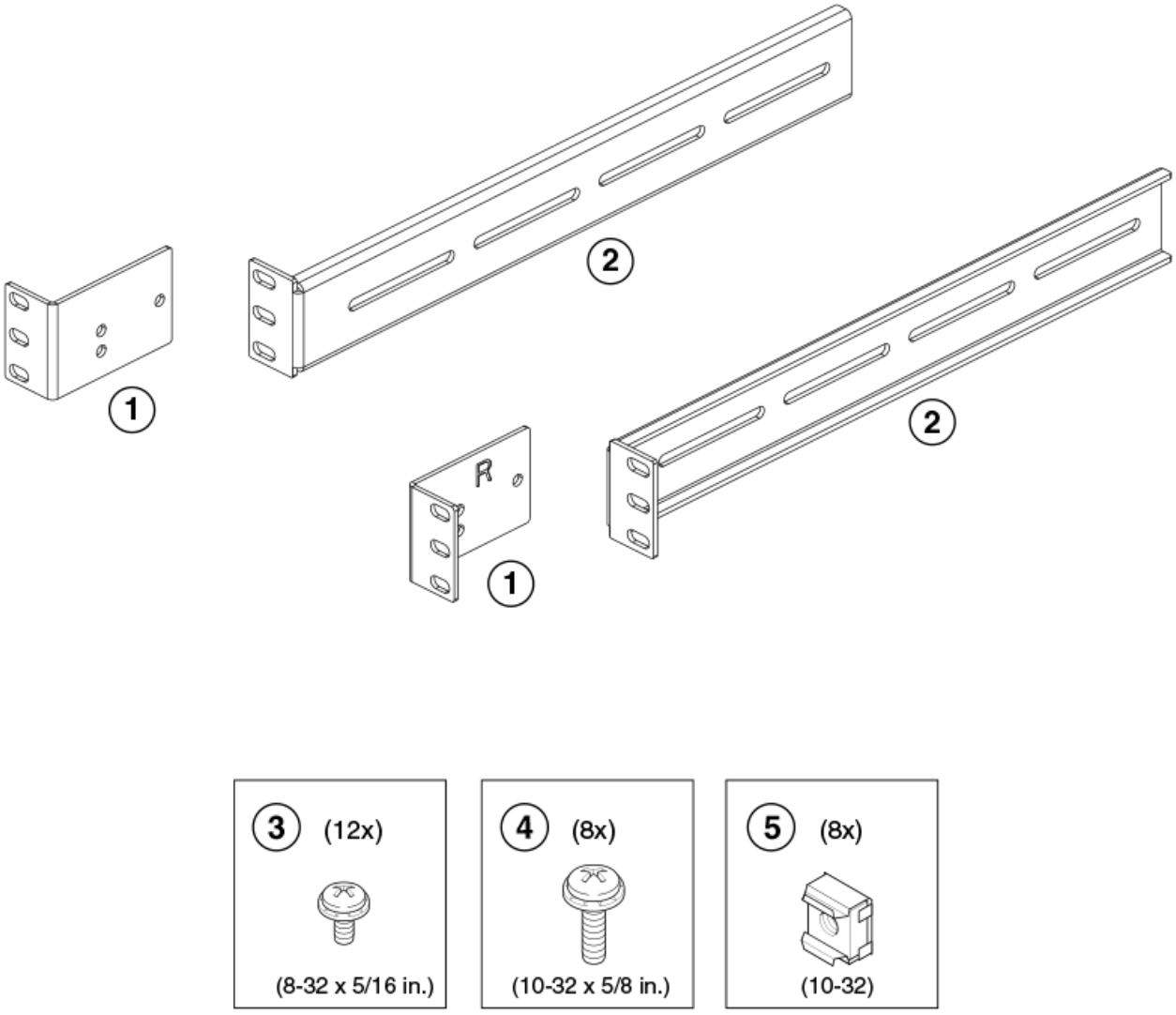
NOTE
You may need two people to install the device, one to support the device, while the other secures it into the rack.

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 Flush-Mount Rack Kit for Two-Post Racks (XBR-000307 and XBR-R000293):

FIGURE 10 Rack kit parts



1. Front brackets, right and left (2)
2. Rear brackets, right and left (2)
3. Screw, 8-32 x 5/16-in., panhead Phillips (12)
4. Screw, 10-32 x 5/8-in., panhead Phillips (8)
5. 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 both single height (1U) and double height (2U) devices, the illustrations show a 2U device as a typical installation.

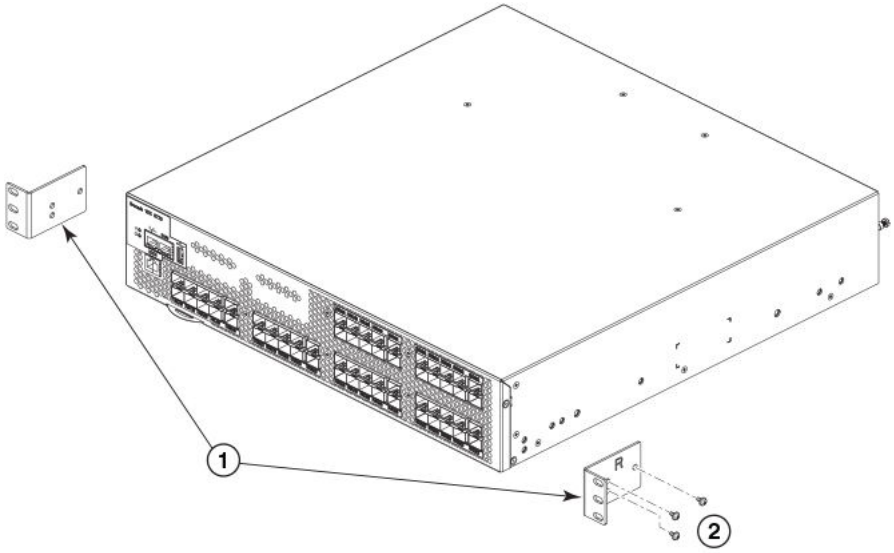
Attaching the front brackets to the device

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 through the pair of vertically aligned holes in the bracket and then into the pair of holes on the side of the device.
3. Insert another 8-32 x 5/16-in. screw through the third hole in the bracket and into the corresponding hole in the device.
4. Repeat step 1 through step 3 to attach the left front bracket to the left side of the device. Tighten all 8-32 x 5/16-in. screws to a torque of 15 in-lbs. (17 cm-kgs).

FIGURE 11 Attaching the front brackets



1. Front brackets, right and left
2. Screw, 8-32 x 5/16-in., panhead Phillips

Attaching the front brackets to the rack

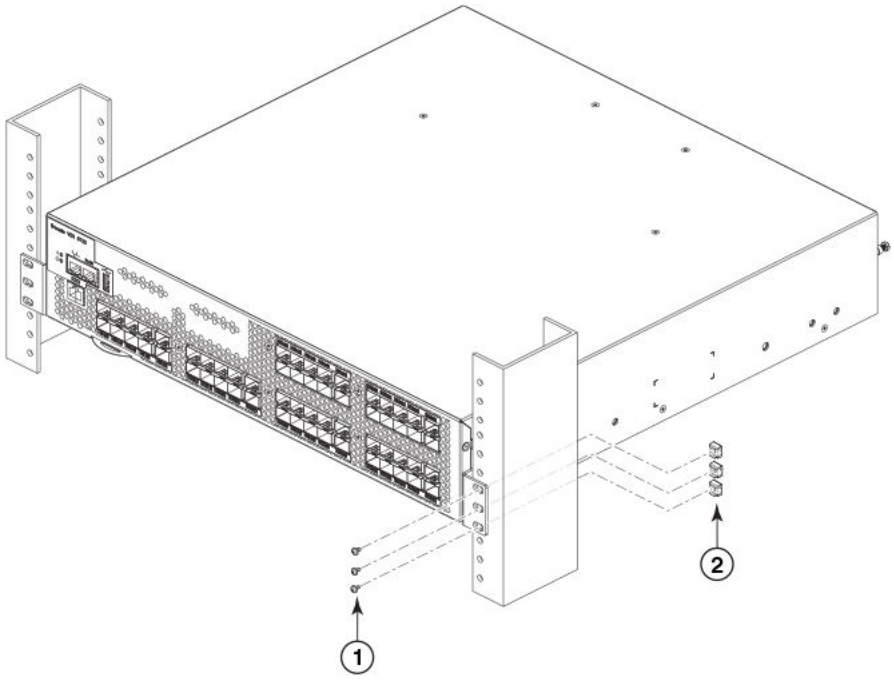
NOTE
Install the device with the airflow aligned with any other devices in the rack. Some devices have airflow running from port side to fan side and others have the opposite arrangement. Make sure that the airflow for all devices moves in the same direction to maximize cooling. Refer to the Hardware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

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 fully secured to the rack.
2. Attach the right front bracket to the right rack upright using three 10-32 x 5/8-in. screws and three retainer nuts as shown in the following figure.

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

FIGURE 12 Attaching front brackets to a rack



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

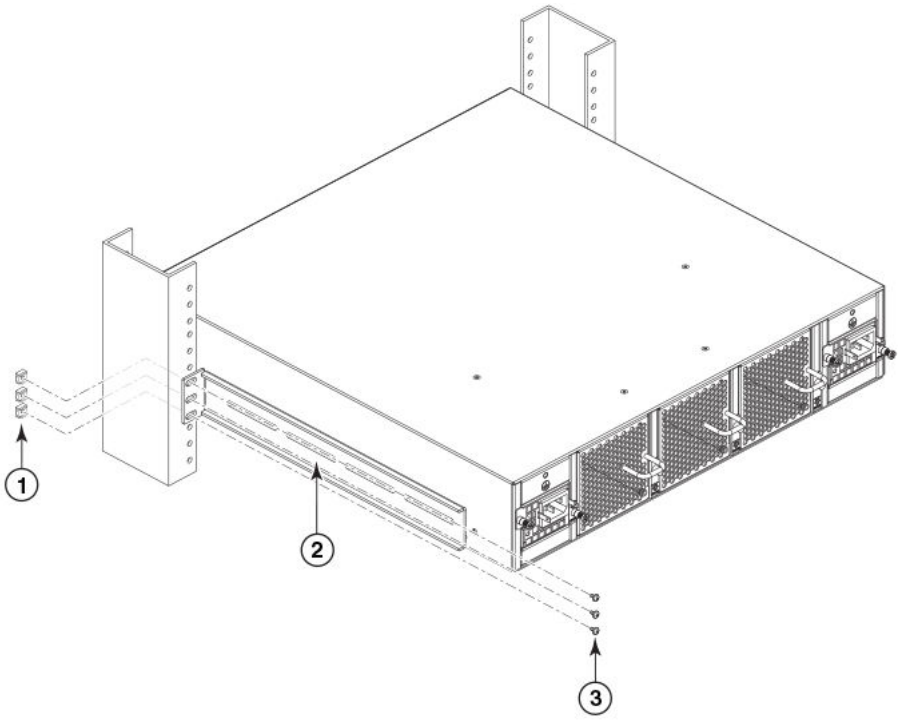
Attaching the rear brackets to the rack

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 to the right rack upright using three 10-32 x 5/8-in. screws and retainer nuts.
3. Repeat step 1 and step 2 to attach the left rear bracket to the left rack upright.

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

FIGURE 13 Attaching the rear brackets to a rack



1. Retainer nut, 10-32
2. Rear brackets, right (left side similar)
3. Screw, 10-32 x 5/8-in., panhead Phillips

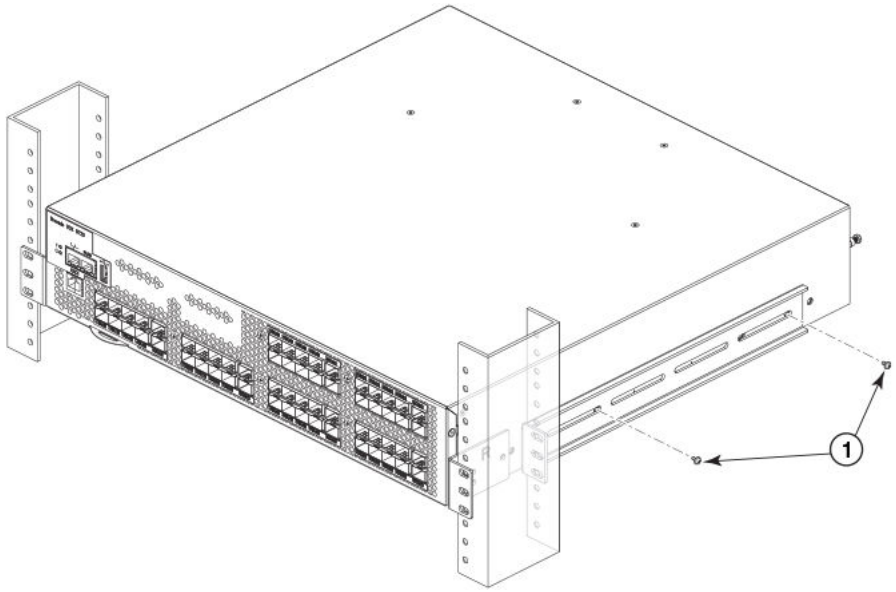
Attaching the rear brackets to the device

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 using two 8-32 x 5/16-in. screws, 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 using two 8-32 x 5/16-in. screws, attach the bracket to the device.

3. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lbs. (17 cm-kgs).

FIGURE 14 Attaching the rear bracket to the device



1. Screws, 8-32 x 5/16-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.
- Before mounting your device, review any specific installation and facility requirements in this Hardware Installation Guide.
- 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).

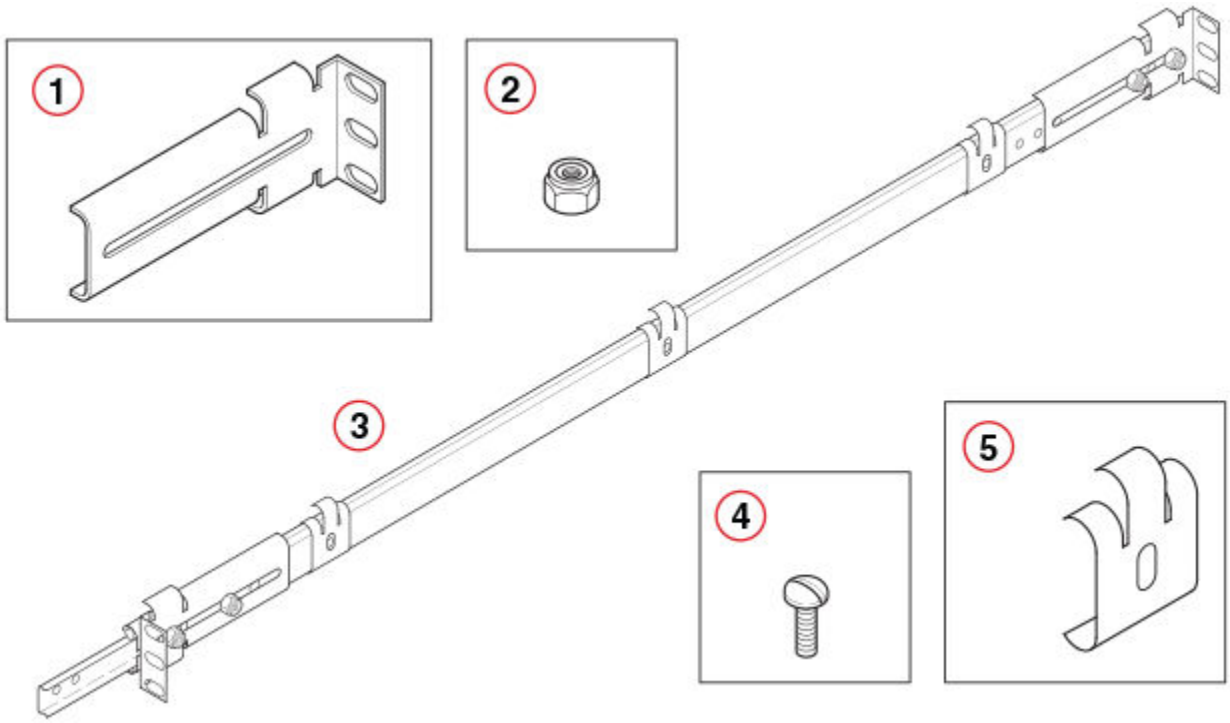
NOTE

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

NOTE

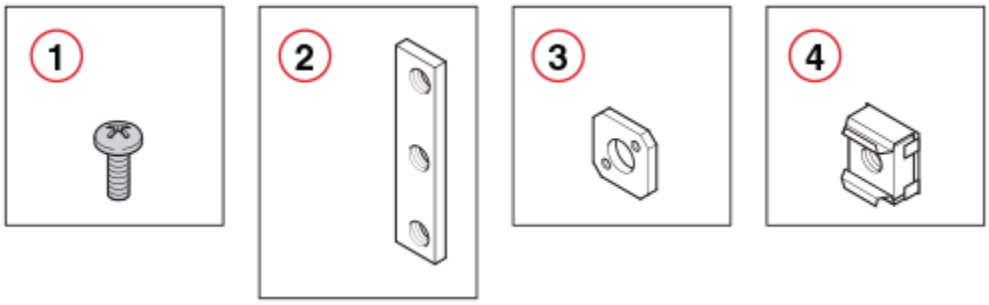
Depending on the device type, not all parts may be used in an installation.

FIGURE 15 Rack kit parts (1 of 4)



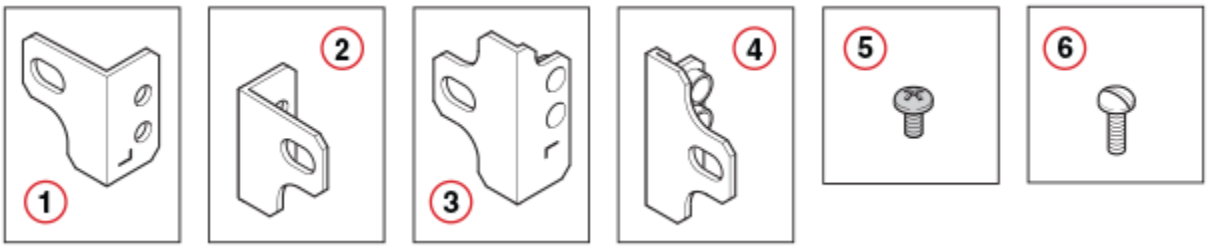
1. Three-hole slide mount L-bracket (4)
2. Locking hex nut, 8-32 (8)
3. Slide assembly, containing one inner and one outer slide rail, with Items 2, 3, 4, and 5 installed on the outer slide rail (each slide assembly is bagged separately) (2)
4. Slotted screw, 8-32 x 3/8 in., zinc (8)
5. Power cord clip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

FIGURE 16 Rack kit parts(2 of 4)



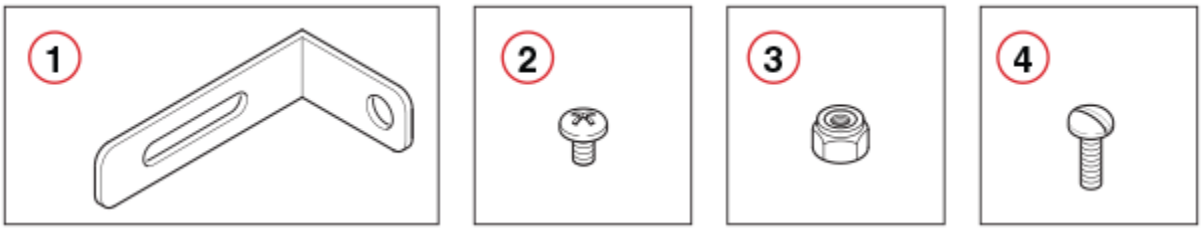
1. Phillips screw, 10-32 x 1/2 in., black (12)
2. Three-hole rack nut bar, 8-32 (4)
3. Alignment washer (12)
4. Retainer nut, 10-32 (12)

FIGURE 17 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 18 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

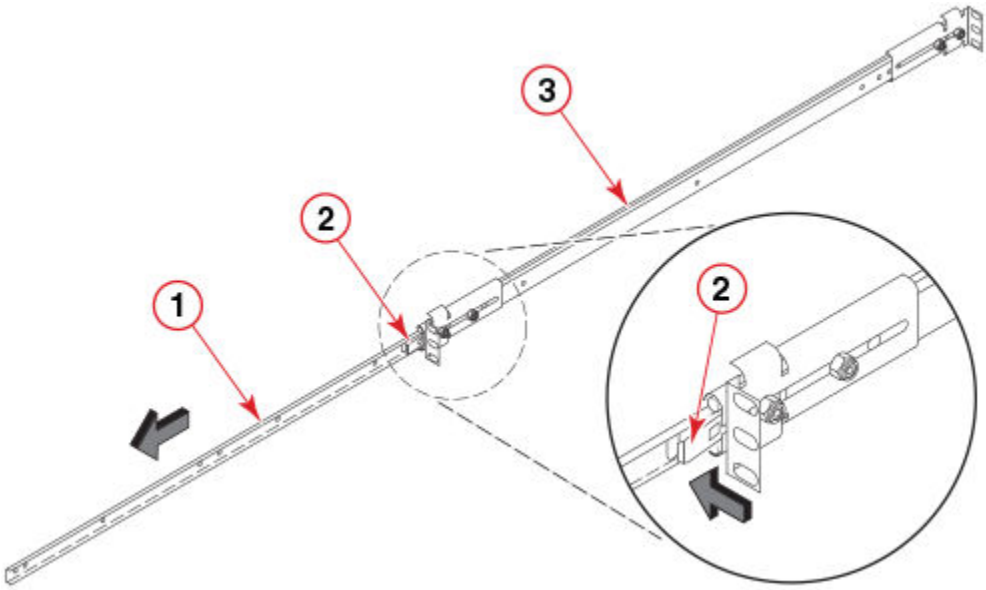
Perform the following steps to prepare both slide assemblies for installation.

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 19 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.

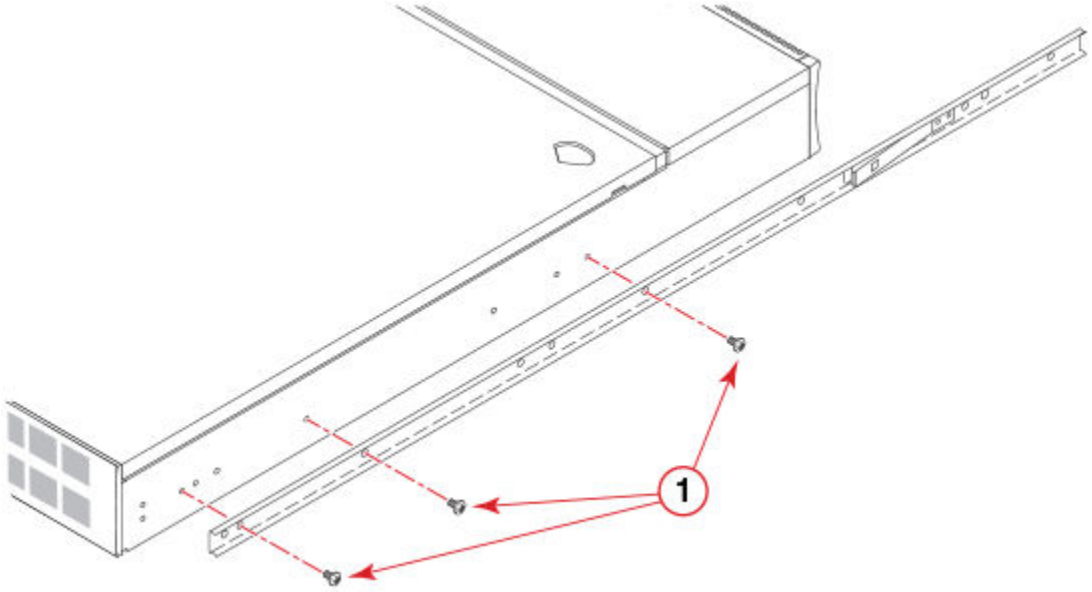
1. Position an inner slide rail with the flat side against the device and the end containing the lock-release lever toward the non-port side of the device.
2. Align the rail holes with the holes drilled in the side of the device, as shown in the following figure.

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 20 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

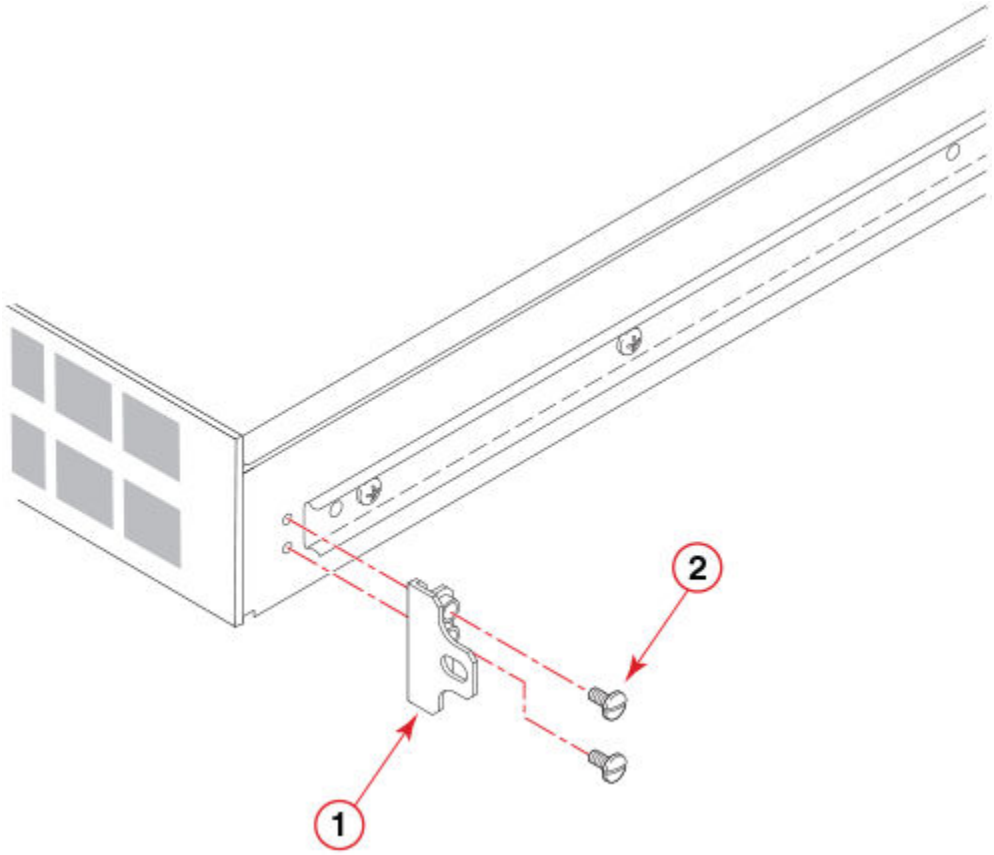
Perform the following steps to attach the rack mount brackets.

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 21 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

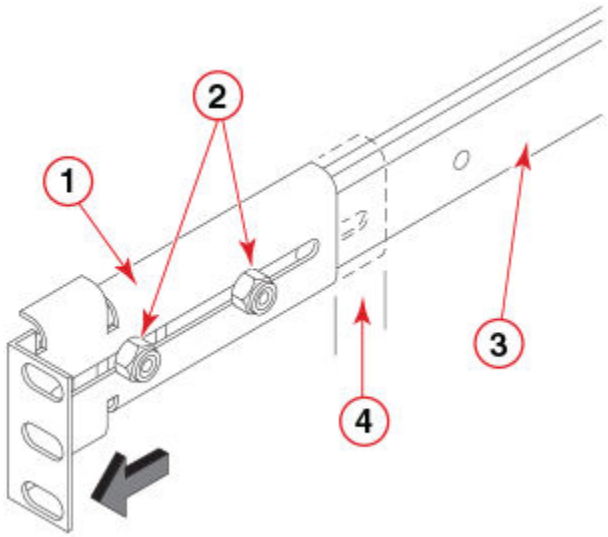
Perform the following steps to reposition the port side L-bracket for correct mounting.

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 22 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.

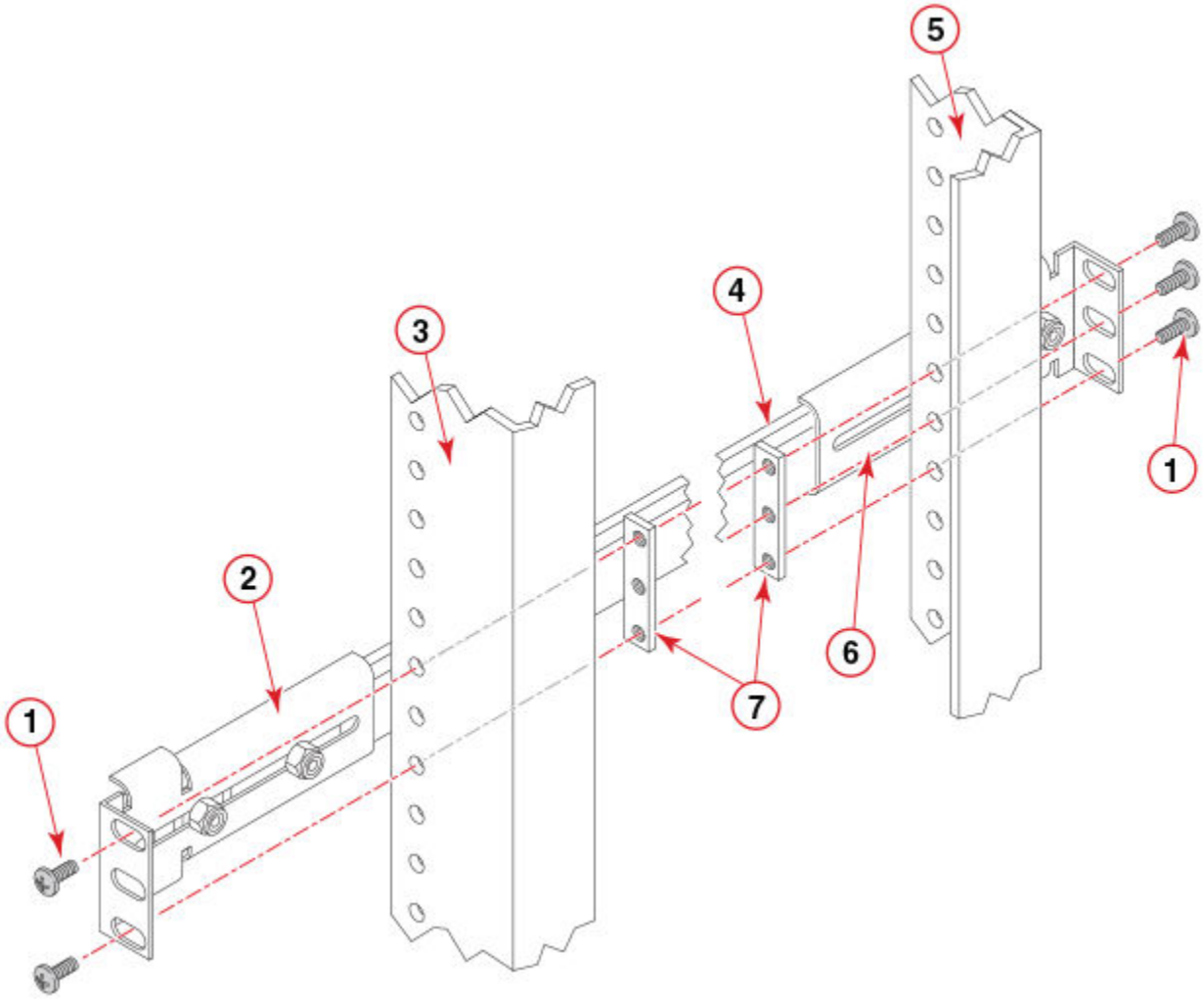
3. Attach the L-brackets to the rack posts using five Phillips 10-32 x 1/2 in. screws and two of the three-hole rack nut bars.

   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 44).

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

5. Repeat these steps for the other rail.

FIGURE 23 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.

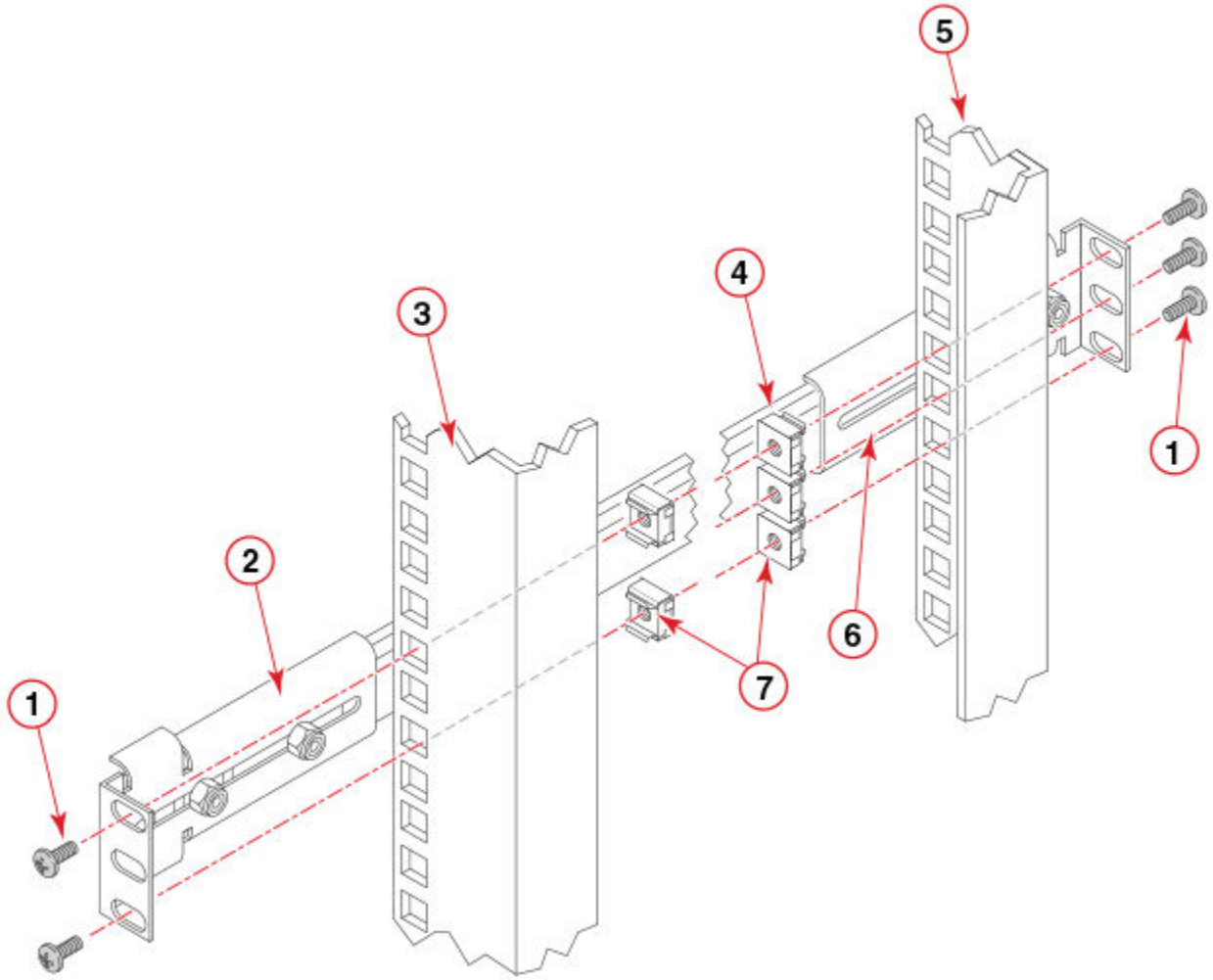
3. Attach the L-brackets to the rack posts using five Phillips 10-32 x 1/2 in. screws and five retainer nuts.

   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 44).

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

5. Repeat these steps for the other rail.

FIGURE 24 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.

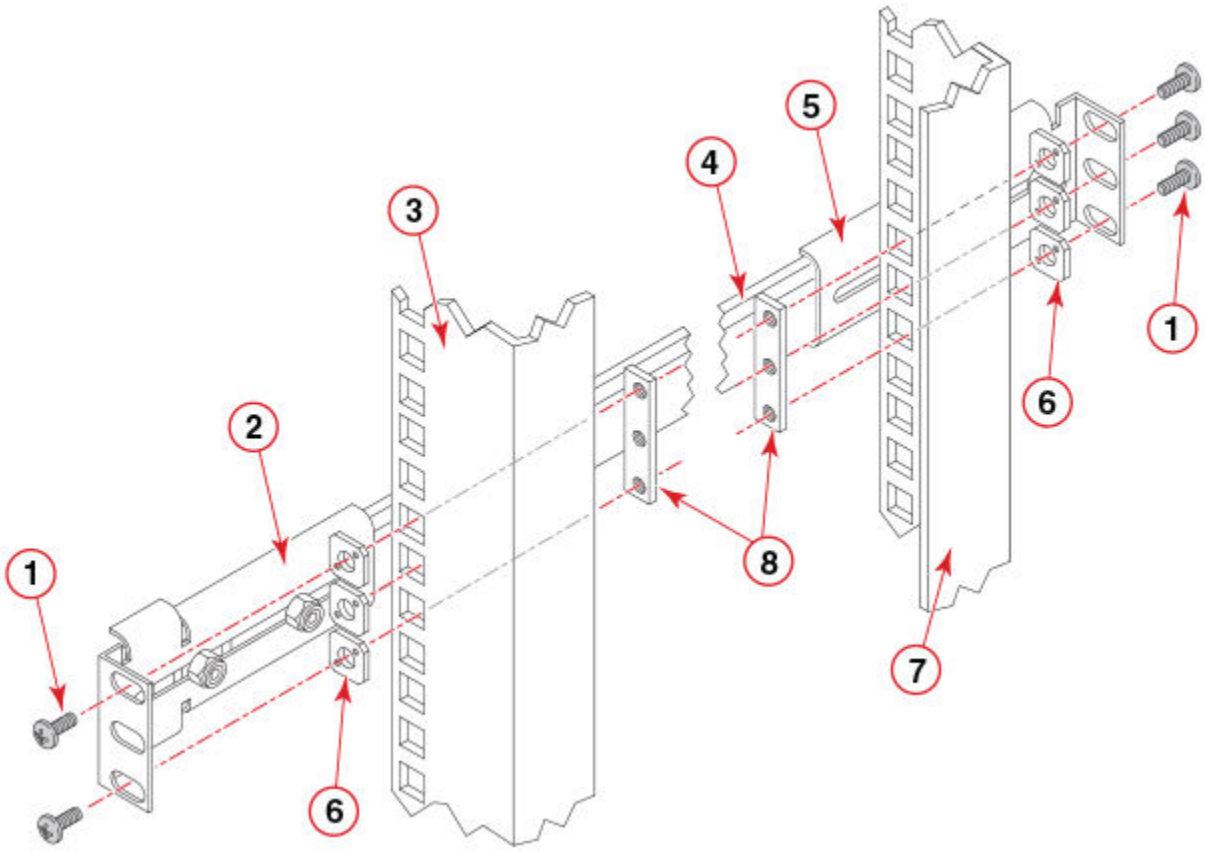
   NOTE
   If side rack access is not available, measure the depth of the rack, loosen the L-bracket on the non-port side, and adjust the bracket position until the total rail length matches the rack depth.

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 44); 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 25 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)

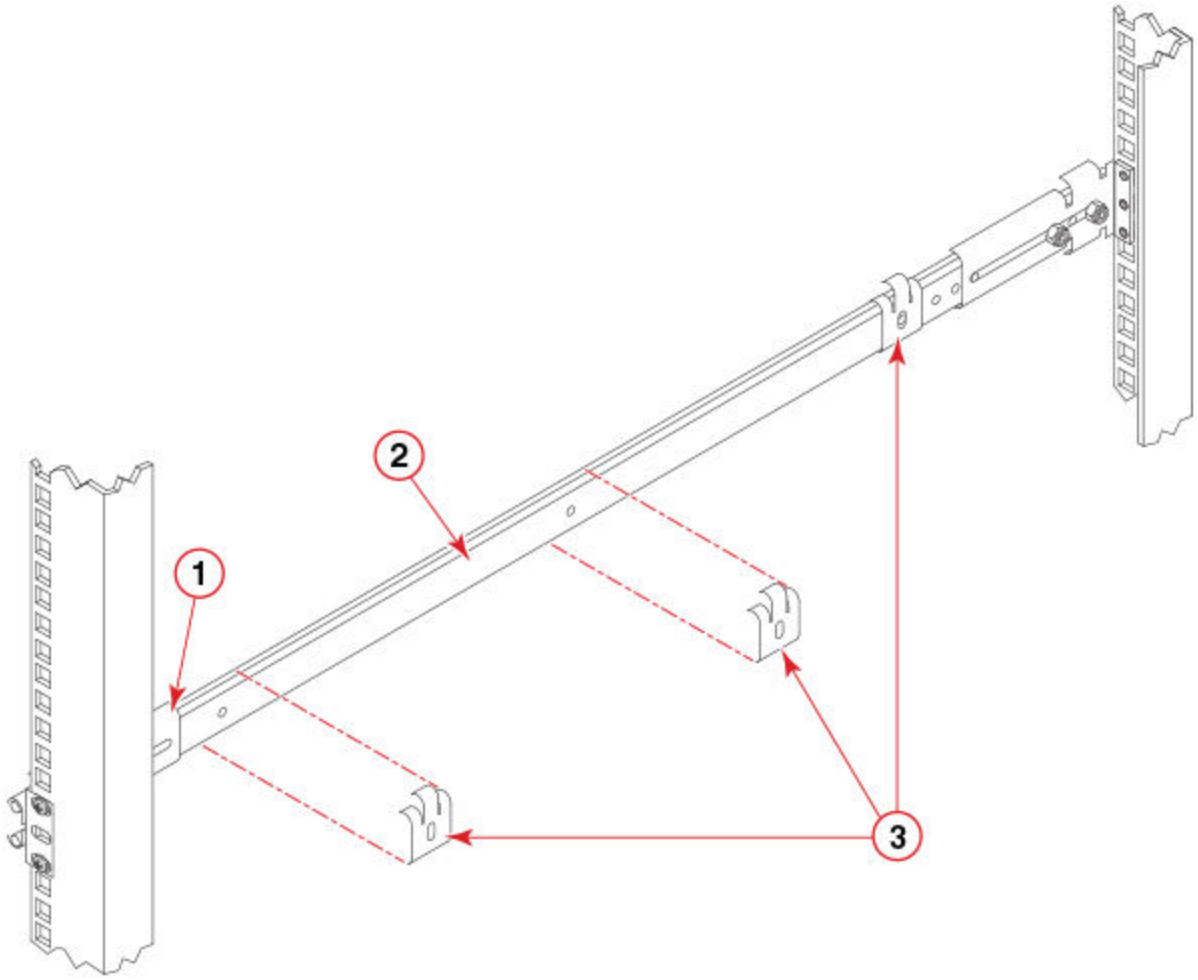
Inserting the device in the rack

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 26 Attaching the power cord clips



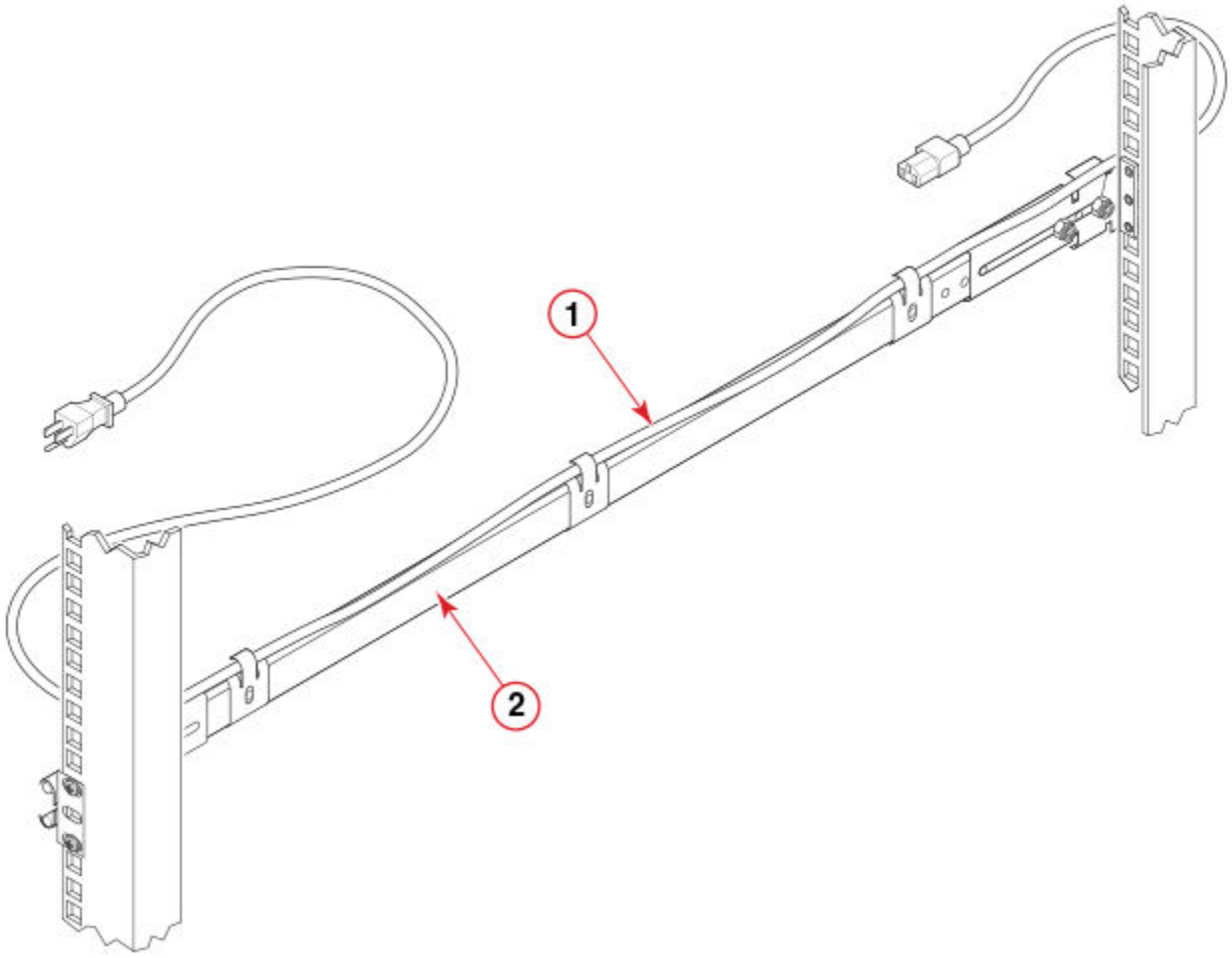
1. Three-hole slide mount L-bracket
2. Slide assembly
3. Power cord clips (3 each side)

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 27 Inserting the power cords in clips



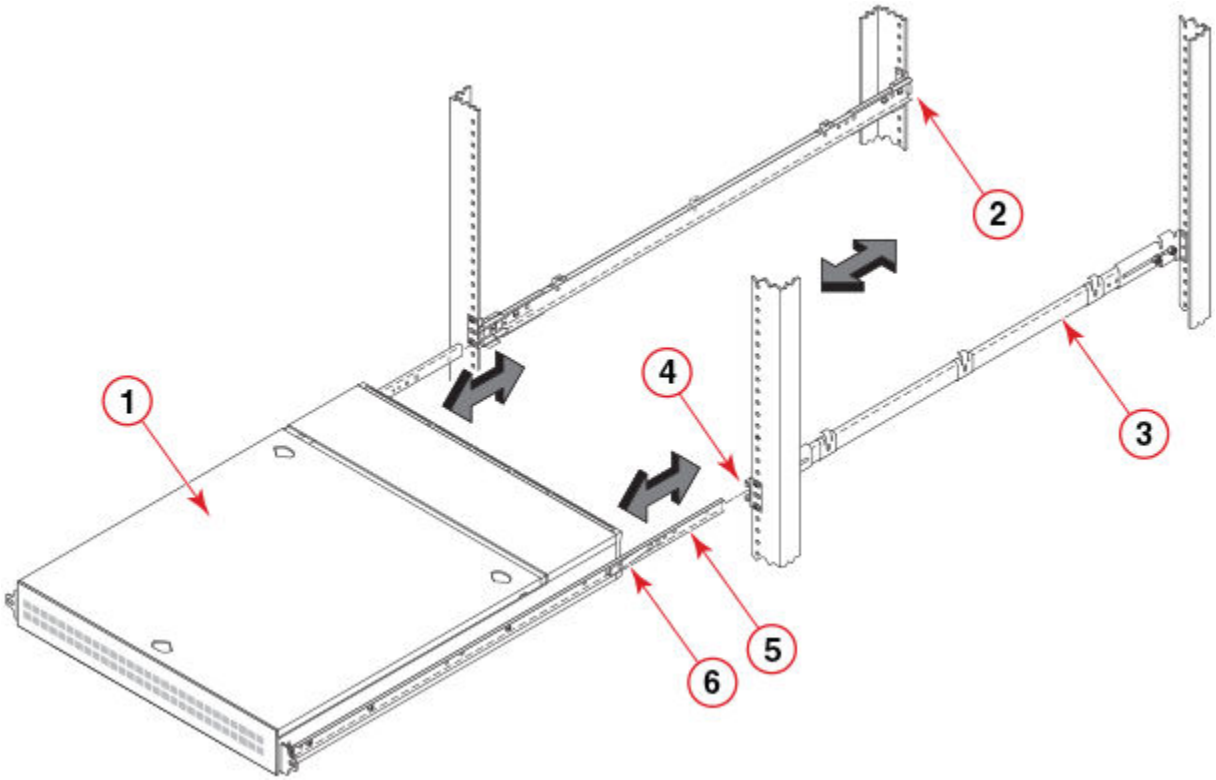
1. Power cord
2. Slide assembly

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 28 Inserting the device



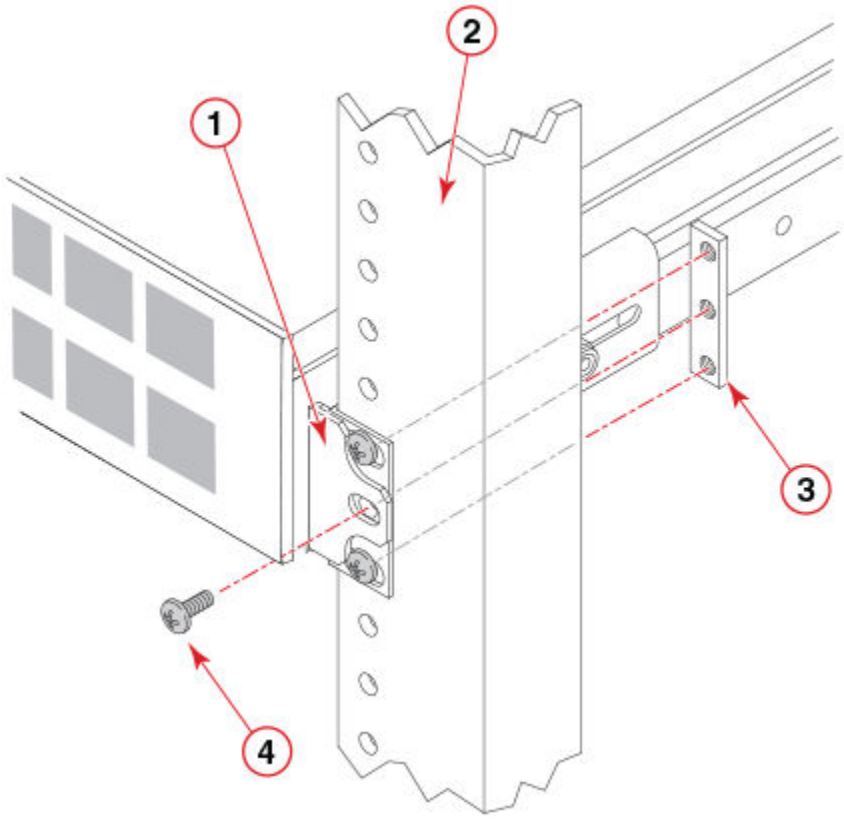
1. device
2. Slide assembly closed end
3. Outer slide rail
4. Slide assembly open end
5. Inner slide rail
6. Lock-release lever

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.

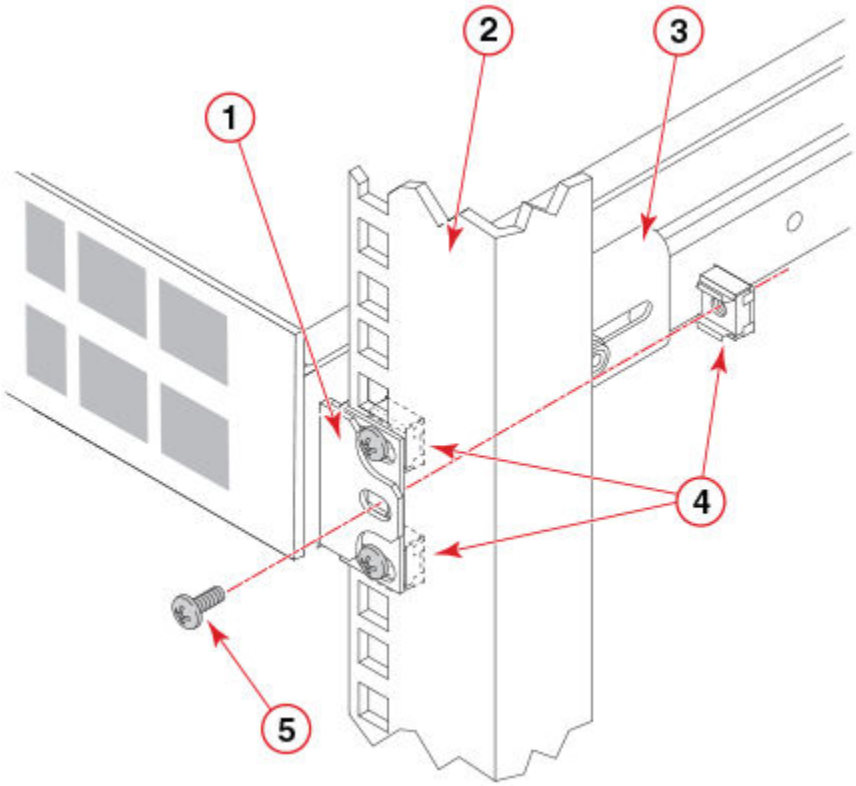
   Refer to Figure 29 for a round-hole rack post; refer to Figure 30 (Method A) or Figure 31 (Method B) for a square-hole rack post.

FIGURE 29 Securing rack mount brackets for round-hole rack posts



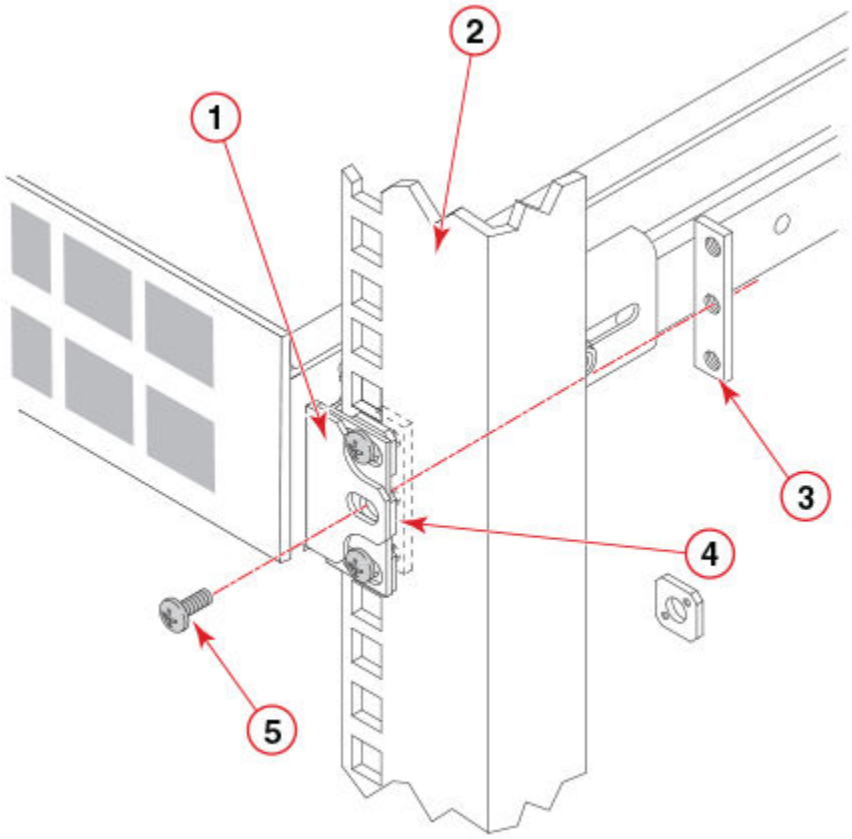
1. Right rack mount bracket
2. Rack post
3. Three-hole rack nut bar, 8-32
4. Phillips screw, 10-32 x 1/2 in., black

FIGURE 30 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 31 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 (24") for Four-Post Racks (XNA-000073 and XNA-100073)

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 (24") for Four-Post Racks (XNA-000073 and XNA-100073).

Observe the following when mounting this device:

- 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 screws in the front and rear brackets.
- Before mounting your device, review any specific installation and facility requirements in this Hardware Installation Guide.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack. Single height (1U) devices are shown for illustration purposes, but the double height (2U) installation is similar.

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 (24"):

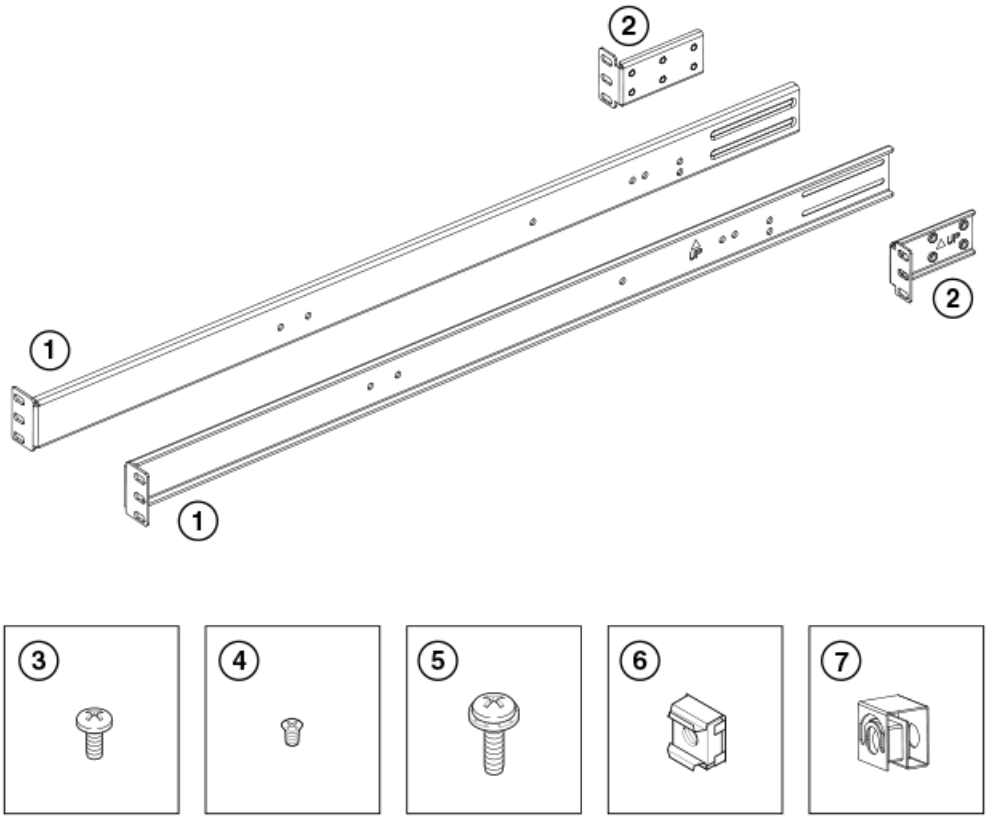
- Rack mount kit
- #2 Phillips screwdriver with torque capability

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

Parts list

The following parts are provided with the 1U and 2U Non-Port Side Fixed-Mount Rack Kit (24") for Four-Post Racks (XNA-000073 and XNA-100073).

FIGURE 32 Rack kit parts



1. Front brackets, right and left
2. Short rear brackets, right and left
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)
7. Clip nuts, 10-32, for round-hole rack posts (8)

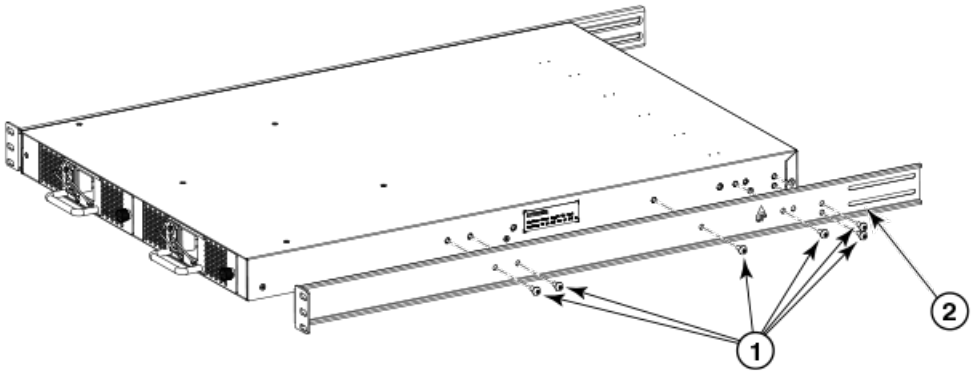
NOTE
Not all parts may be used with certain installations depending on the device type.

Attaching front brackets

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. Be sure that the arrowhead is pointing upward when mounted.
2. Insert two 8-32 x 5/16-in. screws into the front pair of vertically aligned holes in the bracket and then into the pair of holes on the side of the device.
3. Insert four more 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.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lbs. (17 cm-kgs).
5. Repeat step 1 through step 4 to attach the left front bracket to the left side of the device. Again, be sure that the arrowhead is pointing upward when mounted.

FIGURE 33 Positioning the front bracket



1. Screws, 8-32 x 5/16-in., panhead Phillips (4)
2. Bracket, front right

NOTE
Although this document describes how to install both single height (1U) and double height (2U) devices, single illustrations may show either device type as examples. The only significant difference between single-height and double-height installation is that the double-height installation uses five screws to attach the front bracket to the device.

Installing the device in the rack

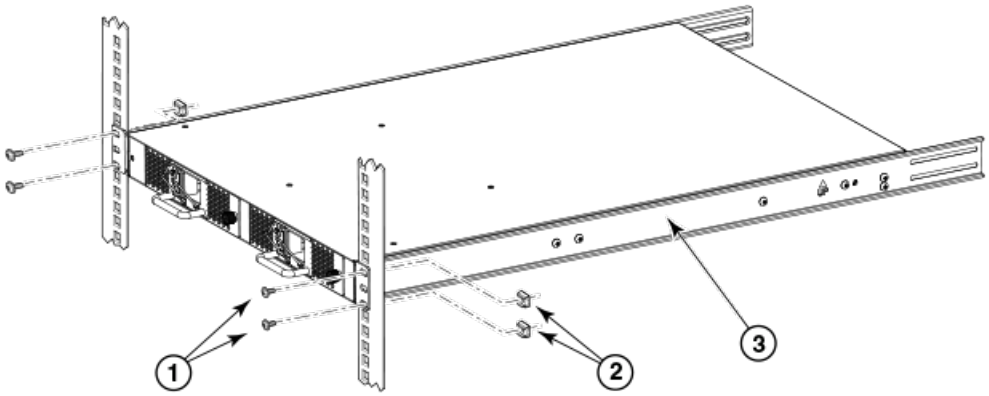
NOTE
Two people are required to install the device in a rack. One person can hold the device while the other attaches it to the rack.

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

1. Position the device in the rack, 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 upright using two 10-32 x 5/8-in. screws and two retainer nuts as shown in the following figure. Select the correct nuts for either square or round holes in the rack posts. A single height device is shown, but the installation for a double height device is the same.
3. Attach the left front bracket to the left front rack upright using two 10-32 x 5/8-in. screws and two nuts as shown in the following figure.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lbs. (29 cm-kgs).

FIGURE 34 Positioning the device in the rack



1. Screws, 10-32 x 5/8-in., panhead Phillips (2)
2. Retainer nuts, 10-32 (2)
3. Bracket, front right

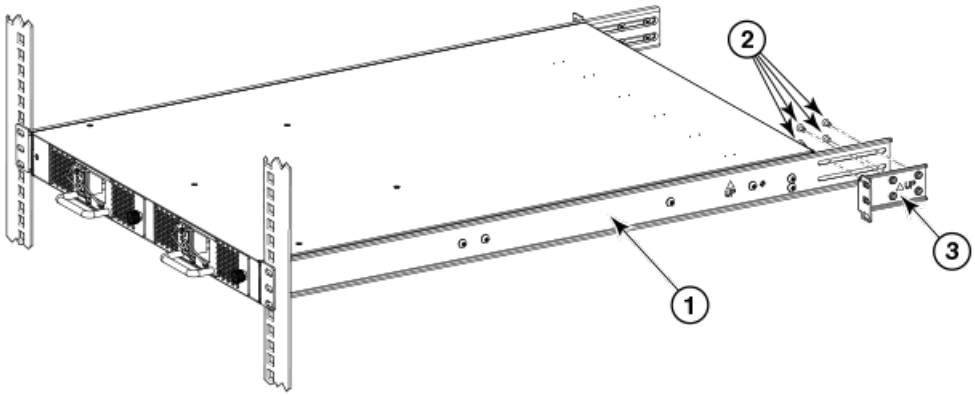
Attaching the rear brackets to front brackets

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

1. Position the right rear bracket inside the right front bracket.
2. Attach the brackets using four (4) 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-lbs. (10 cm-kgs).

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

FIGURE 35 Attaching the rear brackets to the front brackets



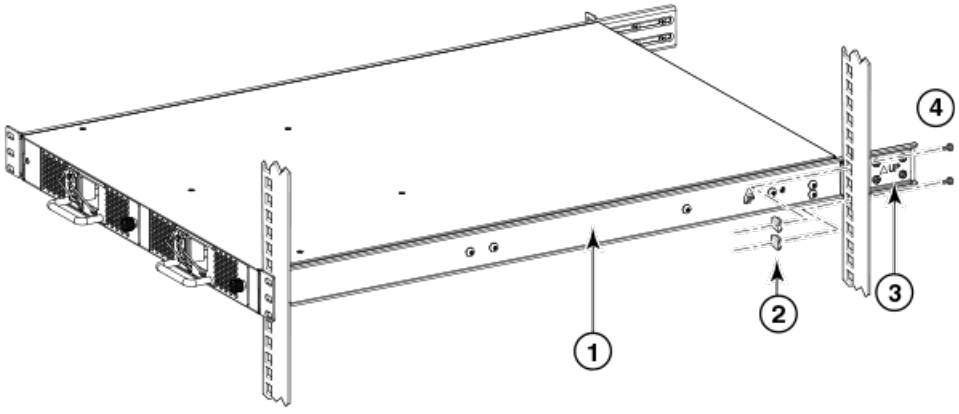
1. Bracket, front right
2. Screws, 6-32 x 1/4-in., flathead Phillips (4)
3. Bracket, rear right

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

FIGURE 36 Attaching the rear brackets to the rack posts



1. Bracket, front right
2. Retainer nuts, 10-32 (2)
3. Bracket, short rear right
4. Screws, 10-32 x 5/8-in., panhead Phillips (2)

Initial Setup and Verification

Once you have set up the Brocade 6520 in a rack or as a standalone switch, it is time to give it power and a basic configuration. If you are going to use the Brocade 6520 in a single-switch setup, you can use EZSwitchSetup to complete the basic configuration.

Go to the *my.brocade.com* website to download the *EZSwitchSetup* software and instructions. If you do not want to use EZSwitchSetup, follow the instructions in the rest of this section.

Items required for initial setup

The following items are required for installing, configuring, and connecting the Brocade 6520 for use in a network and fabric:

- Workstation with an installed terminal emulator, such as HyperTerminal
- Unused IP address and corresponding subnet mask and gateway address
- Items from the accessory kit that accompanies the switch
- Ethernet cable
- Brocade-branded SFP+s transceivers and compatible cables (Brocade-branded 16 Gbps SFP+s transceivers required for 16 Gbps performance), as required
- Access to an FTP server or USB device for backing up the switch configuration (optional)

Providing power to the switch

Perform the following steps to provide power to the Brocade 6520.

1. Connect the power cords first to both power supplies in the chassis and then to power sources on separate circuits to protect against AC failure. Ensure that the cords have a minimum service loop of 6 inches available and are routed to avoid stress.

   The power supplies power up as soon as they are plugged in. The power supply LEDs display green. The power LED on the front of the switch turn green as well. The system status LED on the front panel will be amber until POST completes and then it will turn green. If a second power supply is installed but NOT plugged into a power source, the AC status light on the power supply will be out and the DC status light will be amber. If the second power supply IS plugged into a power source, then both LEDs will be green.

   NOTE
   Power is supplied to the switch as soon as the first power supply is connected.

2. After POST is complete, verify that the switch power and status LEDs on the left of the port side of the switch are green. Refer to Brocade ISL Trunking on page 60 for the specific location of these LEDs.

Creating a serial connection

You will perform all configuration tasks in this guide using a serial connection.

Complete the following steps to create a serial connection to the switch.

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

   If the serial port on the workstation is RJ45 instead of RS-232, remove the adapter on the end of the serial cable and insert the exposed RJ45 connector into the RJ45 serial port on the workstation.
2. Open a terminal emulator application (such as HyperTerminal on a PC, or TERM, TIP, or Kermit in a UNIX environment), and configure the application as follows:
   - In a Windows environment:

Parameter	Value
Bits per second	9600
Databits	8
Parity	None
Stop bits	1
Flow control	None

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
```

Switch IP address

You can configure the Brocade 6520 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 Brocade 6520 supports both IPv4 and IPv6. If you are using IPv6, consult the *Brocade Fabric OS Command Reference* for details when issuing the **ipaddrset** command.

Using DHCP to set the IP address

When using DHCP, the Brocade 6520 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 Brocade 6520, use a static IP address.

Setting a static IP address

Complete the following steps to set a static IP address.

1. Log in to the switch using the default password (the default passsword is *password*).
2. Use the **ipaddrset** command to set the Ethernet IP address.

   If you are going to use an IPv4 IP address, enter the IP address in dotted decimal notation as prompted. As you enter a value for a line in the following example, the next line appears.

   For instance, the Ethernet IP address appears first. When you enter a new IP address or simply press **Enter** to accept the existing value, the Ethernet Subnetmask line appears.

   In addition to the Ethernet IP address itself, you can set the Ethernet subnet mask, the Gateway IP address, and whether to obtain the IP address by way of DHCP or not.

```
switch:admin> ipaddrset
Ethernet IP Address [192.168.74.102
]:
Ethernet Subnetmask [255.255.255.0
]:
Gateway IP Address [192.168.74.1
]:
DHCP [Off]: off
```

   If you are going to use an IPv6 address, enter the network information in semicolon-separated notation as a standalone command.

```
switch:admin> ipaddrset -ipv6 --add 1080::8:800:200C:417A/64
IP address is being changed...Done.
```

Date and time settings

The Brocade 6520 maintains the current date and time inside a battery-backed real-time clock (RTC) circuit. Date and time are used for logging events. Switch operation does not depend on the date and time; a Brocade 6520 with an incorrect date and time value still functions properly. However, because the date and time are used for logging, error detection, and troubleshooting, you should set them correctly.

Time zones

You can set the time zone for the switch by name. You can also set country, city, or time zone parameters.

If the time zone is not set with the new options, the switch retains the offset time zone settings. The **tsTimeZone** command includes an option to revert to the prior time zone format. For more information about the **--old** option, refer to the *Brocade Fabric OS Command Reference*.

You can set the time zone for a switch using the **tsTimeZone** command. The **tsTimeZone** command allows you to perform the following tasks:

- Display all of the time zones supported in the firmware
- Set the time zone based on a country and city combination or based on a time zone ID such as PST

The time zone setting has the following characteristics:

- You can view the time zone settings. However, only those with administrative permissions can set the time zones.
- The **tsTimeZone** setting automatically adjusts for Daylight Savings Time.

- Changing the time zone on a switch updates the local time zone setup and is reflected in local time calculations.
- By default, all switches are in the Greenwich Mean Time (GMT) time zone (0,0). If all switches in a fabric are in one time zone, it is possible for you to keep the time zone setup at the default setting.
- System services that have already started will reflect the time zone changes only after the next reboot.
- Time zone settings persist across failover for high availability.

Local time synchronization

You can synchronize the local time of the principal or primary fabric configuration server (FCS) switch to a maximum of eight external Network Time Protocol (NTP) servers. To keep the time in your SAN current, it is recommended that the principal or primary FCS switch has its time synchronized with at least one external NTP server. The other switches in the fabric will automatically take their time from the principal or primary FCS switch.

All switches in the fabric maintain the current clock server value in nonvolatile memory. By default, this value is the local clock server of the principal or primary FCS switch. Changes to the clock server value on the principal or primary FCS switch are propagated to all switches in the fabric.

When a new switch enters the fabric, the time server daemon of the principal or primary FCS switch sends out the addresses of all existing clock servers and the time to the new switch. If a switch with Fabric OS 5.3.0 or later has entered the fabric, it will be able to store the list and the active servers; pre-Fabric OS 5.3.0 switches will ignore the new list parameter in the payload and will update only the active server address.

If the active NTP server configured is IPv6, then distributing the same information in the fabric will not be possible to switches earlier than Fabric OS 5.3.0 because IPv6 is supported for Fabric OS 5.3.0 and later. The default value LOCL will be distributed to pre-Fabric OS 5.3.0 switches.

The **tsClockServer** command accepts multiple server addresses in IPv4, IPv6, or DNS name formats. When multiple NTP server addresses are passed, **tsClockServer** sets the first obtainable address as the active NTP server. The rest are stored as backup servers that can take over if the active NTP server fails. The principal or primary FCS switch synchronizes its time with the NTP server every 64 seconds.

Setting the date and time

Complete the following steps to set the date and time.

1. Log in to the switch using the default password (the default password is *password*).

2. Enter the **date***"mmddHHMMyy"* command (the double quotation marks are required):

```
date "mmddHHMMyy"
```

The following values are used in the **date** command:

- *mm* is the month; valid values are 01 through 12.
- *dd* is the date; valid values are 01 through 31.
- *HH* is the hour; valid values are 00 through 23.
- *MM* is minutes; valid values are 00 through 59.
- *yy* is the year; valid values are 00 through 99 (values greater than 69 are interpreted as 1970 through 1999, and values less than 70 are interpreted as 2000 through 2069). Refer to the following example to first show the date and time and then change them.

```
switch:admin> date
Fri Sep 29 17:01:48 UTC 2007
switch:admin> date "0927123007"
Thu Sep 27 12:30:00 UTC 2007
switch:admin>
```

Setting time zones

You must perform the procedure on *all* switches for which the time zone must be set. However, you only need to set the time zone once on each switch, because the value is written to nonvolatile memory.

Use one of the two following procedures to set the time zone. The first procedure requires you to select the actual time zone and the second requires you to select the country location of the switch.

The following procedure describes how to set the current time zone using **timezonename** mode.

1. Log in to the switch using the default password (the default password is *password*).
2. Enter the **tsTimeZone** command as follows:

```
switch:admin> tstimezone [--interactive]/ [, timezonename]
```

Use **timezonename** to set the time zone by country/city or by time zone ID, such as PST.

The following example shows how to change the time zone to US/Central.

```
switch:admin> tstimezone
Time Zone : US/Pacific
switch:admin> tstimezone US/Central
switch:admin> tstimezone
Time Zone : US/Central
```

The following procedure describes how to set the current time zone using interactive mode to Pacific Standard Time.

1. Enter the **tsTimeZone** command as follows:

```
switch:admin> tstimezone --interactive
```

You are prompted to select a general location from the list displayed.

```
Please identify a location so that time zone rules can be set correctly.
```

2. Enter the appropriate number from the list or **Ctrl-D** to quit.
3. At the prompt, select a country location from the list displayed.
4. At the prompt, enter the appropriate number to specify the time zone region from the list displayed or **Ctrl-D** to quit.

Synchronizing local time using NTP

Perform the following steps to synchronize the local time using NTP.

1. Log in to the switch using the default password (the default password is *password*).
2. Enter the **tsClockServer** "*ntp1;ntp2*" command where *ntp1* is the IP address or DNS name of the first NTP server, which the switch must be able to access. The *ntp2* value is the name of the second NTP server and is optional. The entire operand "*<ntp1;ntp2>*" is optional; by default, this value is LOCL, which uses the local clock of the principal or primary switch as the clock server.

```
switch:admin> tsclockserver "132.163.135.131"

switch:admin> tsclockserver
132.163.135.131
switch:admin>
```

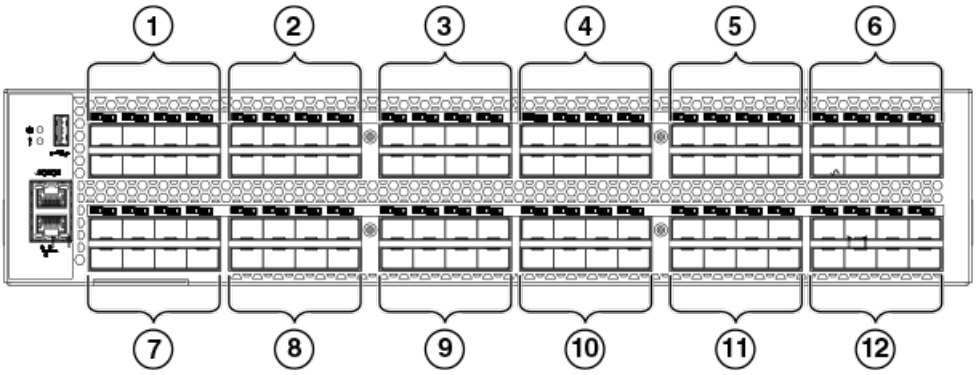
The following example shows how to set up more than one NTP server using a DNS name:

```
switch:admin> tsclockserver
 "10.32.170.1;10.32.170.2;ntp.localdomain.net"
Updating Clock Server configuration...done.
Updated with the NTP servers
Changes to the clock server value on the principal or primary FCS switch are propagated to all
switches in the fabric.
```

Brocade ISL Trunking

Brocade Inter-Switch Link (ISL) Trunking is optional software requiring a license that allows you to create trunking groups of ISLs between adjacent switches. Up to eight ports within a port group on the Brocade 6520 can be used as a trunking group to achieve speeds up to 128 Gbps (256 Gbps full duplex) for optimal bandwidth utilization and load balancing.

FIGURE 37 Port groups of the Brocade 6520



1. FC ports 0-7
2. FC ports 8-15
3. FC ports 16-23
4. FC ports 24-31
5. FC ports 32-39

6. FC ports 40-47
7. FC ports 48-55
8. FC ports 56-63
9. FC ports 64-71
10. FC ports 72-79
11. FC ports 80-87
12. FC ports 88-95

For more information about Brocade ISL Trunking, refer to the *Brocade Fabric OS Administration Guide*.

Monitoring the Device

LED activity interpretation

System activity and status can be determined through the activity of the LEDs on the switch.

Sometimes, the LEDs 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.

Brocade 6520 LEDs

The Brocade 6520 has the following LEDs:

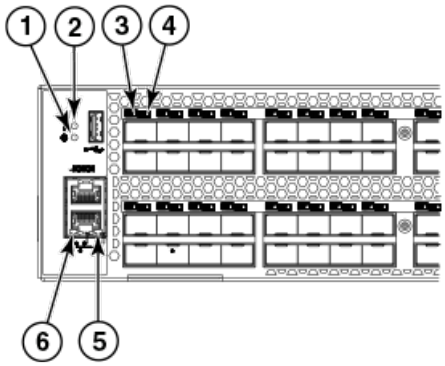
- One system status LED (bicolor: green/amber).
- One power status LED (green).
- Two Ethernet port LEDs (green).
- One port status LED for each port on the switch (bicolor: green/amber). These LEDs are arrayed above each pair of Fibre Channel ports.
- Two power supply status LEDs per power supply (AC indicator is bicolor: green/amber and DC indicator is green).
- One fan status LED per fan (bicolor: green/amber).

NOTE
The serial console port LEDs do not light up at any time, even when a cable is inserted and the link is active.

LED locations

The following figure shows the port side of the Brocade 6520. The port status LEDs for the FC ports are arranged left and right to correspond to the upper and lower ports in each pair. Refer to Port side of the Brocade 6520 on page 11 for the locations of the FC ports.

FIGURE 38 LEDs on port side of Brocade 6520



1. System power LED
2. System status LED
3. FC port status LED (port 0)
4. FC port status LED (port 4)
5. Ethernet port activity LED
6. Ethernet port speed LED

The following table describes the port side LEDs and their behavior.

TABLE 2 Port side LED patterns during normal operation

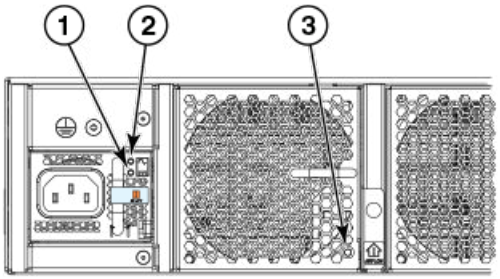
LED name	LED color	Status of hardware	Recommended action
Power Status (green)	No light	The switch is off or there is an internal power supply failure.	Verify that the system is powered on, the power cables are attached, and your power source is live. The unit may be faulty. Contact your switch service provider.
	Steady green	The switch is on.	No action required.
System Status (bicolor - amber/green)	No light	The switch is off or there is no power.	Verify that the system is on and has completed booting.
	Steady green	The switch is on and functioning properly.	No action required.
	Steady amber (for more than five seconds)	A system fault has occurred. This LED displays steady amber during POST; this is normal and does not indicate a fault.	Power cycle the switch. Check the failure indicated on the system console. Contact your switch service provider.
	Blinking amber	Attention is required. A number of variables can cause this status including a single power supply failure, a fan failure, or one or more environmental ranges has been exceeded.	Check the management interface and the error log for details on the cause of status. Contact your switch service provider.
Ethernet Speed (green)	No light	Port speed is 10 Mbps.	No action required.
	Steady green	Port speed is 100 or 1000 Mbps.	No action required.

TABLE 2 Port side LED patterns during normal operation (continued)

LED name	LED color	Status of hardware	Recommended action
Ethernet Activity/Link (green)	No light	There is no link.	Verify that the Ethernet cable is connected correctly.
	Steady green	There is a link.	No action required.
	Blinking green	There is link activity (traffic).	No action required.
Optical media port status(one bi-color LED for each FC port)	Off	There is no light or signal carrier (module or cable).	Verify that the transceiver is installed correctly and that the cable is connected correctly.
	Steady amber	The port is receiving light or carrier, but is not online.	No action required.
	Slow blinking amber (2 sec)	The port is disabled (by diagnostics or by **portDisable** command).	Verify that the diagnostic tests are not being run. Re-enable the port using the **portEnable** command.
	Fast blinking amber (1/2 sec)	The port has failed.	Check the management interface and the error log for details on the cause of the failure. Contact Technical Support if necessary.
	Steady green	The port is online.	No action required.
	Slow blinking green (2 sec)	The port is online but is segmented (loopback cable or incompatible switch).	Check the firmware level of the attached switch.
	Fast blinking green (1/2 sec)	There is an internal loopback (diagnostic).	No action required.
	Flickering green	The port is online and frames are flowing through the port.	No action required.

The following figure shows the LEDs on the non-port side of the switch.

FIGURE 39 LEDs on non-port side of Brocade 6520



1. Power supply DC status LED
2. Power supply AC status LED
3. Fan status LED

The following table describes the LEDs on the non-port side of the switch.

- The power supply DC and AC status LEDs are managed by the power supply firmware and not Fabric OS.
- If both the AC and DC status LEDs are black/off, then it means that the power supply is off.
- Host-standby power supply mode is not supported.

TABLE 3 Non-port side LED patterns during normal operation

LED name	LED color	Status of hardware	Recommended action
Power supply AC input status (one green LED)	No light	Power supply is not receiving AC input voltage or AC input voltage is below operational limit.	Verify that the power supply is properly seated and the power cord is connected to a functioning AC power source.
	Steady green	AC input voltage is within operational range.	No action required.
Power supply DC output status (one bi-color LED)	Flashing yellow (1:1)	Output voltage is not enabled.	Verify that the power supply is fully seated and that the captive screw is secured.
	Flashing yellow/green (2:1)	Over temperature warning.	Verify that ambient temperature is less than 40C and check for intake airflow blockage.
	Flashing yellow/green (1:1)	Internal fan is out of regulation.	Replace the power supply.
	Steady yellow	Power supply is faulty or not plugged in completely.	Check the power cord, current, voltage, and temperature to determine the problem.
	Steady green	DC output OK.	No action required.
Fan assembly status (one bi-color LED)	No light	Fan assembly is not receiving power.	Verify that the fan FRU is seated correctly.
	Steady green	Fan assembly is operating normally.	No action required.
	Steady amber (for more than 5 seconds)	Fan fault for one of the following reasons: • A fan assembly with mismatched airflow is present. • One or more of the fans in the fan assembly has failed.	Try one of the following: • Replace the mismatched fan assembly with one that has the correct airflow direction. • Replace the faulty fan assembly.

POST and boot-up specifications

When the switch is turned on or rebooted, the switch performs power-on self-test (POST). Total boot-up time with POST can be several minutes. POST can be omitted after subsequent reboots by using the **fastboot** command or entering the **diagDisablePost** command to persistently disable POST.

For more information about these commands, refer to the *Fabric OS Command Reference* .

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.

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.

Boot-up

In addition to POST, boot includes the following tasks after POST is complete:

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

Interpreting POST results

POST is a system check that is performed each time the switch is powered on, rebooted, or reset. During POST, the LEDs flash either amber or green. Any errors that occur during POST are listed in the error log.

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

1. Verify that the switch LEDs indicate that all components are healthy.

   Refer to LED locations on page 63 for descriptions and interpretations of LED patterns. If one or more LEDs do not display a healthy state, verify that the LEDs on the switch are not set to "beacon" by entering the **switchShow** command to detect if beaconing is active.
2. Verify that the switch prompt displays on the terminal of a computer workstation connected to the switch.

   If there is no switch prompt when POST completes, press **Enter** . If the switch prompt still does not display, try opening a Telnet session or accessing the switch through another management tool. If this is not successful, the switch did not successfully complete POST. Contact your switch supplier for support.
3. Review the switch system log for errors. Any errors detected during POST are written to the system log, accessible through the **errShow** command.

   For information about all referenced commands, and on accessing the error log, refer to the *Brocade Fabric OS Administration Guide*. For information about error messages, refer to the *Brocade Fabric OS Message Reference*.

Brocade 6520 maintenance

The Brocade 6520 is designed for high availability and low failure; it does not require any regular physical maintenance. It includes diagnostic tests and field-replaceable units, described in the following sections.

Installing an SFP+ transceiver

The Brocade 6520 supports only Brocade-branded 8 Gbps and 16 Gbps SFP+ optical transceivers. For the Fibre Channel connections, the Brocade 6520 uses SFP+ transceivers that support any combination of Short Wavelength (SWL), Long Wavelength (LWL), and Extended Long Wavelength (ELWL) optical media.

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.

Complete the following steps to install an SFP+ transceiver.

1. Making sure that the bail (wire handle) is in the unlocked position, position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks; then close the bail.

   The 16 Gbps SFP+ transceivers do not have bails. Use the pull tab on the 16 Gbps SFP+ transceivers to help push the transceiver into the port. Do not push too hard on the tab itself becasue it can bend.

   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.

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.

   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 a cable intended for an mSFP transceiver into a regular SFP or SFP+ transceiver. You may damage the cable. Do not force a standard SFP cable into an mSFP transceiver. You may damage the transceiver.

   NOTE
   For current information on qualified transceivers supported by this device, refer to the Brocade Fibre Channel Transceiver Platform Support Matrix and Brocade Transceiver Module Resources on www.brocade.com.

   NOTE
   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.

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

FIGURE 40 Installing a 16 Gbps SFP+ in the upper row of port slot

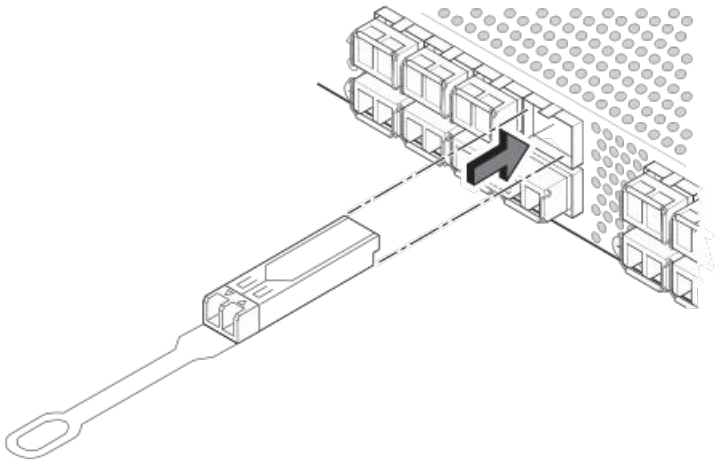
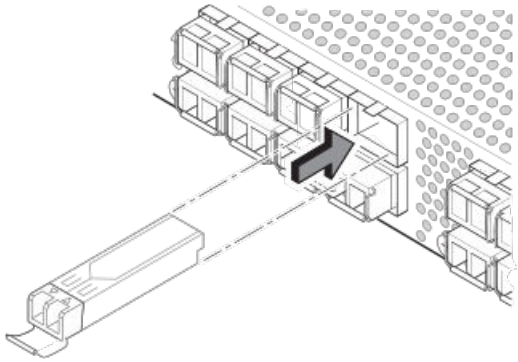


FIGURE 41 Installing an 8 Gbps SFP+ in the upper row of port slot



Diagnostic tests

In addition to 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 serial console connection to the switch. 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 run at link speeds of 2, 4, 8, 10, or 16 Gbps depending on the speed of the link being tested and the type of port.

NOTE

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

For information about specific diagnostic tests, refer to the *Fabric OS Troubleshooting and Diagnostics Guide* .

Removal and Replacement of Power Supplies and Fans

Removal and replacement introduction

NOTE

Read the Mounting options on page 19 before servicing.

The field-replaceable units (FRUs) in the Brocade 6520 can be removed and replaced without special tools. The Brocade 6520 can continue operating during the FRU replacement if the conditions specified in the procedures are followed.

DANGER

The procedures in this manual are for qualified service personnel.

Before beginning replacement

NOTE

This document describes how to change field-replaceable units (FRUs) for units with either a port-side air exhaust or a port-side air intake. You must replace a failed unit with the same type of unit. This applies to both power supplies and fans. A new FRU must have the same part number (P/N) as the FRU being replaced. The manufacturing P/N is located on the top of the FRU.

CAUTION

Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

You can use external labels as a guide. Refer to the following figure. Both the power supply and fan FRUs are labeled with an airflow symbol on the faceplate to indicate whether the assembly takes in or exhausts air. The label also appears on the top of the assembly.

FIGURE 42 Example of an airflow symbol

The green E symbol indicates an exhaust unit. This unit pulls air in from the port side of the switch and exhausts it out the non-port side. This is also called front-to-back airflow or forward airflow. This symbol should appear on FRUs with part numbers ending with **-F.**

The orange I symbol indicates an intake unit. This unit pulls air in from the non-port side of the switch and exhausts it out the port side. This is also called back-to-front airflow or reverse airflow. This symbol should appear on FRUs with part numbers ending with **-R** .

The **chassisShow** command will indicate either "forward" or "reverse" airflow.

If one fan fails, the remaining fans go to high speed to maintain proper cooling until the failed fan is replaced.

If a mismatched power supply or fan is installed by mistake, a critical error message is sent to the console. The message will be similar to the following:

```
CRITICAL HIL-1611 MISMATCH in PSU/FAN Air Flow direction. Replace PSU with fan air flows in same
direction. System will be shut down in 2 minutes.
```

Power supply removal and replacement

The Brocade 6520 has two power supplies, as displayed in Non-port side of the Brocade 6520 on page 13. The Fabric OS identifies the power supplies from left to right on the non-port side as power supply #2 and power supply #1.

Disassembling any part of the power supply voids the part warranty and regulatory certifications. There are no user-serviceable parts inside the power supply.

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.

Because the cooling system relies on pressurized air, do not leave either of the power supply slots empty longer than two minutes while the switch is operating. If a power supply fails, leave it in the switch until it can be replaced. Maintain both power supplies in operational condition to provide redundancy.

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.

Refer to LED locations on page 63 for the power supply status LED colors, behaviors, and actions required, if any.

Determining the need to replace a power supply

Use one of the following methods to determine the status of the power supplies:

- Check the power supply AC status and DC status LEDs. Both should be green (refer to LED locations on page 63). If the DC status LED is amber, there is no power on the cord.
- In Web Tools, click the **Power Status** icon.
- At the command prompt, enter the **psShow** command to display power supply status:

```
br6520:admin> psshow
Power Supply #1 is OK
Airflow Direction : Portside Intake (Forward)
Power Supply #2 is OK
Airflow Direction : Portside Intake (Forward)
br6520:admin>
```

DANGER

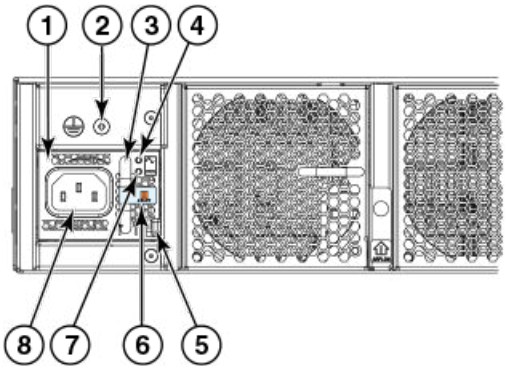
Disconnect the power cord from all power sources to completely remove power from the device.

Time and items required

Replacing a power supply in the Brocade 6520 should require less than two minutes to complete.

To replace a power supply in a Brocade 6520 you need a new power supply that has the same part number and airflow indicator as the power supply being replaced. Refer to the following figure for the location of the airflow label.

FIGURE 43 Brocade 6520 power supply



1. Power supply #2
2. Grounding screw
3. Handle
4. AC input status LED
5. Locking tab
6. Airflow label
7. DC output status LED
8. Power cord receptacle

Replacing a power supply

Complete the following steps to replace a power supply in a Brocade 6520. Refer to Figure 44 for this procedure.

1. To leave the Brocade 6520 in service while replacing a power supply, verify that the other power supply (the one not being replaced) has been powered on for at least four seconds and has a steady green status LED.
2. Unplug the power cord from the power supply that is being replaced.
3. Push the locking tab to the left and hold it there while using the handle on the power supply to pull it straight out and away from the chassis. Pull the power supply out slowly to avoid catching a finger on the locking tab.

4. Slide the new power supply into the chassis until the locking tab engages.

   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.

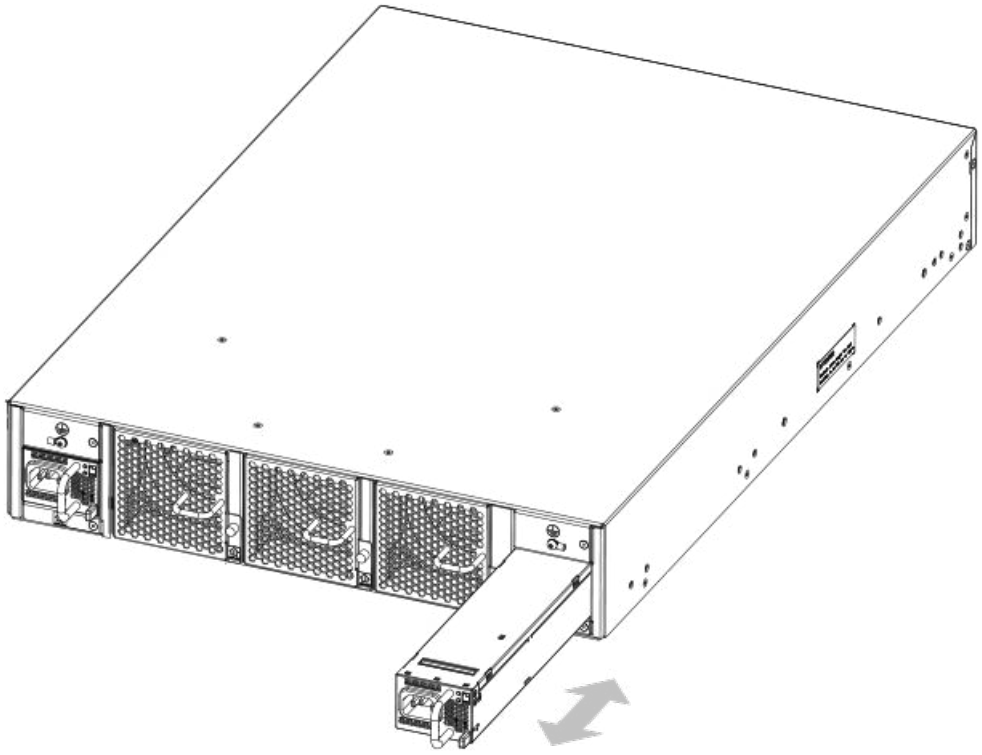
   CAUTION
   Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

   If you observe that the switch has powered down after two minutes after a power supply replacement, it is likely because the new power supply has a mismatched airflow.

5. Plug the power cord into the power supply to power on the unit.

   If the power circuit was on before the replacement, the power supply will immediately attempt to power up.

   FIGURE 44 Inserting the power supply in the Brocade 6520



6. Verify that the LEDs on the new power supply display steady green while the Brocade 6520 is operating (refer to LED locations on page 63). If the LEDs are not steady green, ensure that the power supply is securely installed and seated properly.

   Optionally, if using the command line interface (CLI), enter the **psShow** command at the command line prompt to display the status. You can also use the **chassisShow** command. The power supply status can also be viewed using the Web Tools application.

Fan removal and replacement

The Brocade 6520 has three fans as displayed in Non-port side of the Brocade 6520 on page 13. The Fabric OS identifies the fan locations from left to right as fan #3, fan #2, and fan #1.

Disassembling any part of the fan voids the part warranty and regulatory certifications. There are no user-serviceable parts inside the fan.

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.

Because the cooling system relies on pressurized air, do not leave any of the fan slots empty longer than two minutes while the switch is operating. If a fan fails, leave it in the switch until it can be replaced. Maintain all three fans in operational condition to provide redundancy.

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.

Refer to LED locations on page 63 for the power supply status LED colors, behaviors, and actions required, if any.

Determining the need to replace a fan

Use one of the following methods to determine the status of the fans:

- Check the fan status LED (refer to LED locations on page 63).
- In Web Tools, click the **Power Status** icon.
- Enter the **fanShow** command at the prompt to display fan status.

  NOTE
  Fans 4 and 5 are the fans that are integral to the power supplies. These two fans normally operate at around 12000 RPM while the system fans typically operate around 2000 RPM. Refer to Power supply removal and replacement on page 72 if there are any issues with those two fans.

```
br6520:admin> fanshow
Fan 1 is Ok, speed is 1965 RPM
Fan 2 is Ok, speed is 2011 RPM
Fan 3 is Ok, speed is 2011 RPM
Fan 4 is Ok, speed is 12001 RPM
Fan 5 is Ok, speed is 11995 RPM
br6520:admin>
```

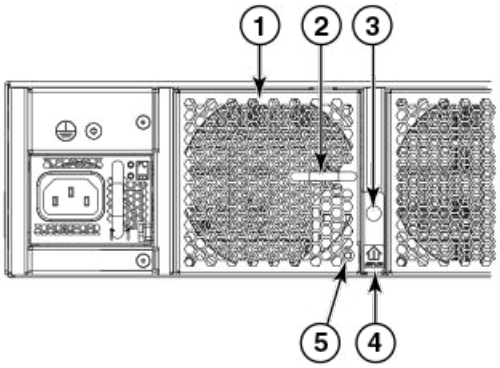
Time and items required

Replacing a fan in the Brocade 6520 should require less than two minutes to complete.

You need the following items to replace a fan in the Brocade 6520:

- A new fan that has the same part number and airflow indicator as the fan being replaced. Refer to Figure 45 for the location of the airflow label
- A #1 Phillips screwdriver

FIGURE 45 Brocade 6520 fan



1. Fan #3
2. Handle
3. Captive screw
4. Airflow label
5. Status LED

Replacing a Brocade 6520 fan

Complete the following steps to replace a fan in a Brocade 6520. Refer to Figure 46 for this procedure.

1. Using the Phillips screwdriver, unscrew the captive screw on the fan.

   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.

2. Remove the fan from the chassis by using the handle on the fan to pull it straight out and away from the chassis.

3. Install the new fan in the chassis:
   a) Check to see that the airflow direction is the same as the fan you are replacing.

   CAUTION
   Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

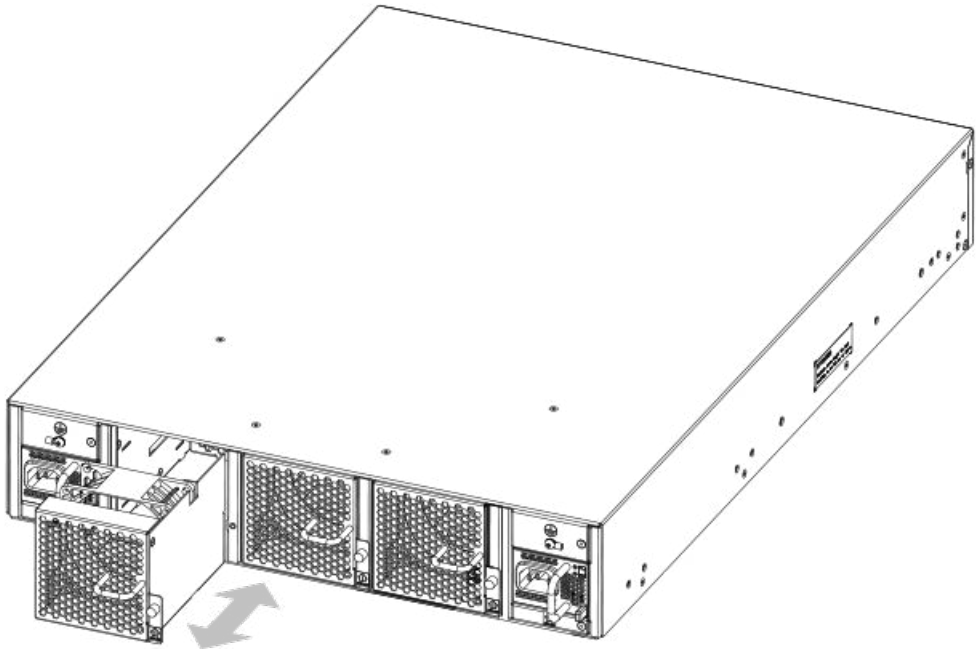
   b) Orient the new fan with the captive screw on the right, as shown in Time and items required on page 75.

   NOTE
   Do not force the installation. If the fan does not slide in easily, ensure that it is correctly oriented before continuing.

   NOTE
   If you observe that the switch has powered down after two minutes after a fan replacement, it is likely because the new fan has a mismatched airflow.

   c) Gently push the fan into the chassis until it is firmly seated.
   d) Using the Phillips screwdriver, secure the fan to the chassis by tightening the captive screw.

   FIGURE 46 Inserting the fan in the Brocade 6520



4. Verify that the fan status LED is steady green to indicate normal operation (refer to LED locations on page 63).

   Optionally, if using the command line interface (CLI), enter the **fanShow** command at the command line prompt to display the status. You can also use the **chassisShow** command. The fan status can also be viewed using the Web Tools application.

SFP+ transceiver removal and replacement

Use the following procedure to remove and replace an 8 Gbps, 10 Gbps, or 16 Gbps SFP+ transceiver.

DANGER
All fiber-optic interfaces use Class 1 lasers.

DANGER
Laser Radiation. Do Not View Directly with Optical Instruments. Class 1M Laser Products.

Time and items required

The replacement procedure for one transceiver takes less than five minutes.

You should have the following items available:

- Replacement SFP+ transceiver
- Optical transceiver extraction tool (for 8 or 10 Gbps transceiver only)

Most Brocade switches and backbones come with a transceiver extraction tool (Figure 47) and holster. The extraction tool is designed to remove transceivers from modules where the space is limited.

FIGURE 47 Optical transceiver extraction tool

Removing an SFP+ transceiver

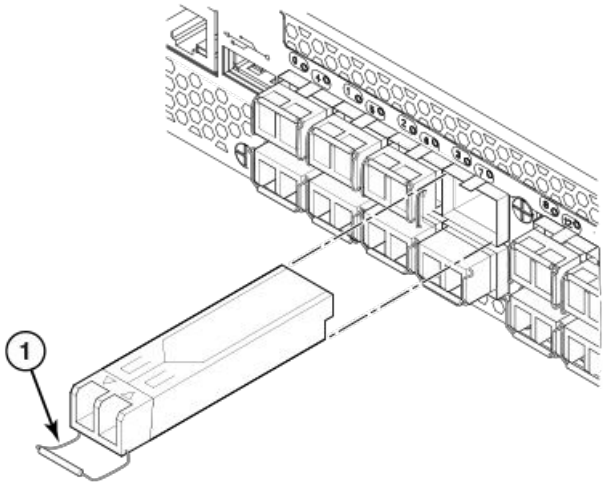
Complete the following steps to remove an SFP+ transceiver.

1. Remove any cables that are inserted into the transceiver. Use the extraction tool to open the cable latching mechanism.

2. Using the hooked end of the tool, pull the bail (wire handle) away from its pivot point and out, sliding the transceiver out of the switch or module.

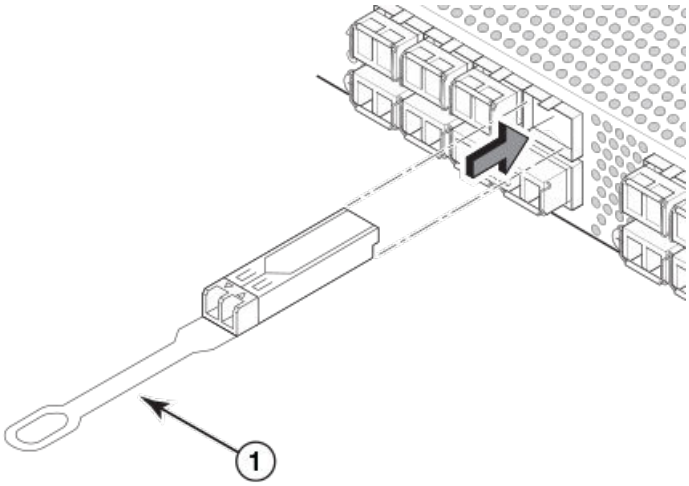
   The 16 Gbps SFP+ transceivers have an attached pull tab. Instead of using the tool, simply grasp the pull tab and pull straight out to remove the 16 Gbps SFP+ transceiver from the switch.

FIGURE 48 Replacing an 8 Gbps or 10 Gbps SFP+ optical transceiver



1. SFP+ bail

FIGURE 49 Replacing a 16 Gbps SFP+ optical transceiver



1. 16-Gbps SFP+ pull tab

Replacing an SFP+ transceiver

Complete the following steps to replace an SFP+ transceiver.

1. Making sure that the bail (wire handle) on an 8 or 10 Gbps transceiver is in the unlocked or open position, position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   The 16 Gbps SFP+ transceivers do not have bails. Use the pull tab on the 16 Gbps SFP+ transceivers to carefully push the transceiver into the port. Grasp the tab near the body of the transceiver to reduce the chances of bending the tab.

   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.
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.

   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.

Brocade 6520 Switch Technical Specifications

This document highlights the features and specifications for the Brocade 6520 switch.

System specifications

System component	Description
Enclosure	2U, front-to-back airflow or back-to-front airflow; power from back
Power inlet	C14
Power supplies	Dual, hot-swappable redundant power supplies with integrated system cooling fans
Fans	Three hot-swappable fan FRUs
Cooling	Options for port side exhaust (default) or non-port side exhaust airflow for cooling
System architecture	Nonblocking shared memory switch
System processors	PowerPC family CPU @ 1.20 GHz
Port-to-port latency	Local port latency: 700 nanoseconds Switch latency: 2100 nanoseconds (2.1 µs with no Forward Error Correction)

Fibre Channel

System component	Description
Fibre Channel ports	Compatible with SWL, LWL, and ELWL SFP+ (for 16 Gbps performance) transceivers. The strength of the signal is determined by the type of transceiver in use. Capable of operating at 2, 4, 8, or 16 Gbps depending on SFP+ transceiver models and able to auto-negotiate to the maximum link speed. • 2, 4, and 8 Gbps performance is enabled by 8 Gbps SFP+ transceivers. • 4, 8, and 16 Gbps performance is enabled by 16 Gbps SFP+ transceivers.
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

LEDs

System component	Description
System	One system status LED (bicolor: green/amber)
Power	One power status LED (green)
Ethernet	Two Ethernet port LEDs (green) for link status

System component	Description
Fibre Channel	One port status LED for each port on the switch (bicolor: green/amber). These LEDs are arrayed above each pair of Fibre Channel ports
Power supply	Two power supply status LEDs per power supply (AC indicator is bicolor: green/amber and DC indicator is green)
Fan	One fan status LED per fan (bicolor: green/amber)

Other

System component	Description
Serial cable	Serial cable with an RJ-45 connector
Serial connector port	One RS-232 console (serial) port with an RJ-45 connector
Management port	An RJ-45 10/100/1000 BaseT connector

Weight and physical dimensions

Model	Height	Width	Depth	Weight
Brocade 6520	8.7 cm 3.4 inches	43 cm 17 inches	61 cm 24 inches	16.9 kg 37.3 lb

Environmental requirements

Condition	Operational	Non-operational
Ambient temperature	0° to 40°C (32° to 104°F)	-25° to 70°C (-13° to 158°F)
Relative humidity (non-condensing)	10% to 85% at 40°C (104°F)	10% to 90% at 70°C (158°F)
Altitude (above sea level)	0 to 3 km (10,000 ft)	0 to 12 km (40,000 ft)
Shock	20 G, 6 ms, half-sine wave	33 G, 11 ms, half-sine wave, 3/eg 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 - 176.7 cmh (104 cfm) Nominal - 52.7 cmh (31 cfm)	N/A
Heat dissipation	1378.5 BTU/hr (no optics configuration) 1706.1 BTU/hr (fully populated port configuration)	N/A
Operating noise	80 dB(A)	N/A

Power supply specifications (per PSU)

Power supply model	Maximum output power rating (DC)	Input voltage	Input line frequency	Maximum input current	Input line protection	Maximum inrush current
XBR-1100WPSA C-F	1080 W	100-240 VAC (nominal) 90-264 VAC (range)	50/60 Hz (nominal) 47-63 Hz (range)	~12.0 A - 5.0 A	Both AC lines are fused	40 A peak @ 240 VAC during cold startup at 25°C ambient
XBR-1100WPSA C-R	1080 W	100-240 VAC (nominal) 90-264 VAC (range)	50/60 Hz (nominal) 47-63 Hz (range)	~12.0 A - 5.0 A	Both AC lines are fused	40 A peak @ 240 VAC during cold startup at 25°C ambient

Power consumption (typical configuration)

All ports configured with 16 Gbps Avago optics, traffic running (mode 11), fan speed nominal (3030 RPM), and room temperature.

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
Brocade 6520	394 W 3.96 A 1343.8 BTU/hr	387 W 1.94 A 1319.9 BTU/hr	Brocade 6520 does not support -48 VDC input	1	-
	395 W 3.97 A 1347.2 BTU/hr	390 W 2.02 A 1330.2 BTU/hr	Brocade 6520 does not support -48 VDC input	2	-

Power consumption (maximum configuration)

All ports configured with electronic load (or e-load), traffic running (mode 11), fan speed max (8190 RPM), and room temperature.

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
Brocade 6520	464 W 4.67 A 1582.6 BTU/hr	455 W 2.28 A 1551.9 BTU/hr	Brocade 6520 does not support -48 VDC input	1	-
	464 W 4.67 A 1582.6 BTU/hr	457 W 2.34 A 1558.7 BTU/hr	Brocade 6520 does not support -48 VDC input	2	-

Data port specifications (Fibre Channel)

Name	Number	Description
Brocade 6520	96	Up to 96 auto-sensing ports of high-performance 16 Gbps technology in a single domain

Fibre Channel data transmission ranges

Port speed (Gbps)	Cable size (microns)	Short wavelength (SWL)	Long wavelength (LWL)	Extended long wavelength (ELWL)
2	62.5	150 m (492 ft) (OM1)	N/A	N/A
	50	300 m (984 ft) (OM2) 500 m (1640 ft) (OM3)	N/A	N/A
	9	N/A	N/A	N/A
4	62.5	70 m (229 ft) (OM1)	30 km (18.6 miles)	N/A
	50	150 m (492 ft) (OM2) 380 m (1264 ft) (OM3) 400 m (1312 ft) (OM4)	N/A	N/A
	9	N/A	30 km (18.6 miles)	N/A
8	62.5	21 m (68 ft) (OM1)	N/A	N/A
	50	50 m (164 ft) (OM2) 150 m (492 ft) (OM3) 190 m (623 ft) (OM4)	N/A	N/A
	9	N/A	10 km (6.2 miles) or 40 km (24.8 miles)	N/A
10	62.5	33 m (108 ft)	N/A	N/A
	50	82 m (269 ft) (OM1) 300 m (984 ft) (OM2) 550 m (1804 ft) (OM3)	N/A	N/A
	9	N/A	10 km (6.2 miles)	N/A
16	62.5	15 m (49 ft) (OM1)	N/A	N/A
	50	35 m (115 ft) (OM2) 100 m (328 ft) (OM3) 125 m (410 ft) (OM4)	N/A	N/A
	9	N/A	N/A	25 km (15.5 miles)

Serial port specifications (pinout RJ-45)

Pin	Signal	Description
1	Not supported	N/A
2	Not supported	N/A

Pin	Signal	Description
3	UART1_RXD	Receive data
4	GND	Logic ground
5	GND	Logic ground
6	UART2_TXD	Transmit 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
Stop bits	1

Memory specifications

Memory	Type	Size
Main memory	DDR2 SODIMM, 400 MHz, 72-bit bus	2 GB
Boot Flash	-	4 MB
Compact Flash	-	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	[illegible]
	蒙古文	“ཚ་བའི་ས་ཁུལ་གྱི་གནམ་གཤིས་མིན་པའི་ས་ཁུལ་ཁོ་ནར་ཞེན་མེད་བེད་སྤྱོད་བྱས་འཐུས།”
	壮文	Dan hab yungh youq gij dienheiq diuzgen mbouj dwg diegndat haenx ancienz sawjyungh.
	维文	غەيرى ئىسسىق بەلباغ ھاۋا كىلىماتى 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	[illegible]
	蒙古文	“རྒྱ་མཚོའི་ངོས་ལས་མཐོ་ཚད་སྨི2000མན་གྱི་ས་ཁུལ་ཁོ་ནར་ཞེན་མེད་བེད་སྤྱོད་བྱས་འཐུས། ”
	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.

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.

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 80.0 dB(A) in accordance with EN ISO 7779.

Maschinenlärminformations-Verordnung - 3. GPSGV, der höchste Schalldruckpegel beträgt 80.0 dB(A) gemäss EN ISO 7779.

VCCI statement (Japan)

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.

Caution and Danger Notices

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.

CAUTION

Ensure that the airflow direction of the power supply unit matches that of the installed fan tray. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I."

VORSICHT	Vergewissern Sie sich, dass die Luftstromrichtung des Netzteils der eingebauten Lüftereinheit entspricht. Die Netzteile und Lüftereinheiten sind eindeutig mit einem grünen Pfeil und dem Buchstaben "E" oder einem orangefarbenen Pfeil mit dem Buchstaben "I" gekennzeichnet.
MISE EN GARDE	Veillez à ce que le sens de circulation de l'air du bloc d'alimentation corresponde à celui du tiroir de ventilation installé. Les blocs d'alimentation et les tiroirs de ventilation sont étiquetés d'une flèche verte avec un "E " ou d'une flèche orange avec un " I ".
PRECAUCIÓN	Asegúrese de que la dirección del flujo de aire de la unidad de alimentación se corresponda con la de la bandeja del ventilador instalada. Los dispositivos de alimentación y las bandejas del ventilador están etiquetadas claramente con una flecha verde y una "E" o con una flecha naranja y una "I".

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.

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 RTC/NVRAM ne se trouvent pas dans des zones accessibles par l'opérateur. Il y a un risque d'explosion si une batterie est remplacée par un type de batterie incompatible. Éliminez les composants utilisés avec des batteries conformément aux ordonnances et aux règlements locaux.
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.

DANGER

Laser Radiation. Do Not View Directly with Optical Instruments. Class 1M Laser Products.

GEFAHR	Laserstrahlung! Schauen Sie nicht direkt mit optischen Instrumenten in den Laserstrahl herein. Klasse 1M Laserprodukte.
DANGER	Rayonnement de laser. Ne regardez pas directement avec des instruments optiques. Produits de laser de classe 1M.
PELIGRO	Radiacion de Laser. No vea directamente con Instrumentos Opticos. Clase 1M de Productos de Laser.
警告	レーザ放射 光学器具で直接ビームを見ないこと クラス 1 M レーザ製品

DANGER

Use only optical transceivers that are qualified by Brocade Communications Systems LLC 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.

GEFAHR	Verwenden Sie nur optische Transceiver, die von Brocade Communications Systems zugelassen sind und die die Anforderungen gemäß FDA Class 1 Radiation Performance Standards in 21 CFR, Unterkapitel I, sowie IEC 60825 und

	EN60825 erfüllen. Optische Produkte, die diese Normen nicht erfüllen, können Strahlen aussenden, die für das menschliche Auge gefährlich sind.
DANGER	Utilisez uniquement des émetteurs-récepteurs optiques certifiés par Brocade Communications Systems LLC et conformes aux exigences sur la puissance de rayonnement de catégorie 1 de la FDA définies au sous-chapitre 21 CFR I et à les normes IEC 60825 et EN60825. Les produits optiques non-conformes à ces normes sont susceptibles d'émettre une lumière dangereuse pour les yeux.
PELIGRO	Utilice sólo transceptores ópticos aprobados por Brocade Communications Systems LLC y que cumplan con las normas IEC 60825 y EN60825, y con los estándares de rendimiento Clase 1 de FDA definidos en el subcapítulo I de 21 CFR. Los productos ópticos que no cumplan con estos estándares pueden emitir luz dañina para los ojos.