# IBM Storage Networking SAN128B-6

MTM Service information: 8960-F96, 8960-N96

# *Installation, Service, and User Guide*

SC27-9251-00

**Read Before Using**

This product contains software that is licensed under written license agreements. Your use of such software is subject to the license agreements under which they are provided.

Before you use the information in this publication, be sure to read the general information under "Notices" on page 89.

# Contents

# Figures

# Tables

# Read this first

## Summary of changes

This is the first edition of the IBM® System Networking SAN128B-6 Installation, Service, and User Guide.

## Getting help

For the latest version of your product documentation, visit the IBM Publications Center at www.ibm.com/shop/publications/order. Search by form number or title.

For more information about IBM Storage Networking products, go to www.ibm.com/systems/networking.

IBM Redbooks® often provide in depth information about product best practices, configurations, and more technical information. For redbooks associated with this product, enter search terms on the following Web site: www.redbook.ibm.com.

For support information for this and other IBM products, see the IBM Support Portal www.ibm.com/supportportal. Search for the product Machine type or product name.

For Fabric OS Release Notes and access to Fabric OS firmware downloads, go to the IBM Support Portal www.ibm.com/supportportal. Search for the product Machine type or product name, and then follow links for **Downloads**. More detailed instructions are available through the **Accessing firmware updates and OS documentation updates** link on the product documentation CD that is shipped with this product.

You can also contact IBM within the United States at 1-800-IBMSERV (1-800-426-7378). For support outside the United States, you can find the service number through the IBM contacts directory website at www.ibm.com/planetwide/.

Visit the IBM contact website www.ibm.com/contact for contact information for your country or region.

For information about storage and networking industry standards, see the Storage Networking Industry Association (SNIA) website at www.snia.org/.

## Accessibility features for the SAN128B-6

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

### Accessibility features

The following list includes the major accessibility features in this product:

- Light emitting diodes (LEDs) that flash at different rates, to represent the same information as the colors of the LEDs
- Industry-standard devices for ports and connectors
- Management of the product through management applications is available through Web and Graphical User Interface (GUI) options

### Keyboard navigation

This product does not have an attached or integrated keyboard. Any keyboard navigation is provided through the management software and GUI.

### Vendor software

This product includes certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for the accessibility information about its products.

### Related accessibility information

You can view the publications for this product in Adobe Portable Document Format (PDF) using the Adobe Acrobat Reader. The PDFs are provided on a product documentation CD-ROM that is packaged with the product. The CD-ROM also includes an accessible HTML version of this document.

### IBM and accessibility

See the IBM Human Ability and Accessibility Center website at www.ibm.com/able/ for more information about the commitment that IBM has to accessibility.

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# Safety and environmental notices

This section contains information about:



## Safety notices and labels

When using this product, observe the danger, caution, and attention notices contained in this guide. The notices are accompanied by symbols that represent the severity of the safety condition. The danger and caution notices are listed in numerical order based on their IDs, which are displayed in parentheses, for example (D004), at the end of each notice. Use this ID to locate the translation of these danger and caution notices in the Safety Notices publication that is shipped with this product.

The following notices and statements are used in IBM documents. They are listed below in order of increasing severity of potential hazards. Follow the links for more detailed descriptions and examples of the danger, caution, and attention notices in the sections that follow.

- **Note:** These notices provide important tips, guidance, or advice.
- **"Attention notices" on page xv:** These notices indicate potential damage to programs, devices, or data.
- **"Cautions":** These statements indicate situations that can be potentially hazardous to you.
- **"Danger Notices" on page xii:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these situations.
- In addition to these notices, "Safety labels" on page xiv may be attached to the product to warn of potential hazards.

## Cautions

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

### 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.**

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

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

## 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.**

**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.**

**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.**

**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:**
**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.**

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

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

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

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

# 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.

## General dangers

**DANGER**

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

**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.**

## Electrical dangers

**DANGER**

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

**DANGER**

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

**DANGER**

**Remove both power cords before servicing.**

**DANGER**

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

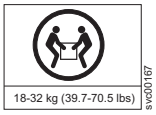
**DANGER**

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

**DANGER**

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

### 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.**

### Laser dangers


**DANGER**

**All fiber-optic interfaces use Class 1 lasers.**

## Safety labels

As an added precaution, safety labels are often installed directly on products or product components to warn of potential hazards. These can be either danger or caution notices, depending upon the level of the hazard.

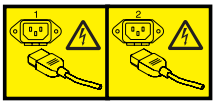
The actual product safety labels may differ from these sample safety labels:

**DANGER**

**Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)**

**DANGER**

**Rack-mounted devices are not to be used as a shelf or work space. (L002)**




**DANGER**

**Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)**

**DANGER**

**Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)**

**CAUTION:**
**Hazardous moving parts nearby. (L008)**

## Attention notices

An attention notice indicates the possibility of damage to a program, device, or system, or to data. An exclamation point symbol may accompany an attention notice, but is not required. A sample attention notice follows:

**Attention:** Do not bend a fibre cable to a radius less than 5 cm (2 in.); you can damage the cable. Tie wraps are not recommended for optical cables because they can be easily overtightened, causing damage to the cable.

## ESD precautions

**Attention:** Many of the field replaceable units (FRUs) are sensitive to electrostatic discharge (ESD), and can potentially be damaged by improper handling. When working with any FRU, use correct ESD precautions:

- Attach ground to the indicated area on the chassis
- Wear a wrist grounding strap connected to chassis ground (if the switch is plugged in) or a bench ground.

  **Note:** For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.
- Store ESD-sensitive components in antistatic packaging

## Rack safety

## Rack installation

**DANGER**

**Observe the following precautions when working on or around your IT rack system:**

- **Heavy equipment—personal injury or equipment damage might result if mishandled.**
- **Always lower the leveling pads on the rack cabinet.**
- **Always install stabilizer brackets on the rack cabinet.**
- **To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.**
- **Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.**

- **Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.**
- **Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.**
- **An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**

**(R001 part 1 of 2)**

**CAUTION:**

- **Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.**
- **Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.**
- **Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.**
- *(For sliding drawers)* **Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.**
- *(For fixed drawers)* **This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.**

**(R001 part 2 of 2)**

## Rack relocation (19" rack)

**CAUTION:**
**Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:**

- **Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must complete these steps:**
  - **Remove all devices in the 32U position and above.**
  - **Ensure that the heaviest devices are installed in the bottom of the rack cabinet.**
  - **Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.**
  - **If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.**
  - **Inspect the route that you plan to take when moving the rack to eliminate potential hazards.**
  - **Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that came with your rack cabinet for the weight of a loaded rack cabinet.**
  - **Verify that all door openings are at least 760 x 2030 mm (30 x 80 in.).**
  - **Ensure that all devices, shelves, drawers, doors, and cables are secure.**
  - **Ensure that the four leveling pads are raised to their highest position.**
  - **Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.**
  - **Do not use a ramp inclined at more than 10 degrees.**
  - **Once the rack cabinet is in the new location, do the following:**
    - **Lower the four leveling pads.**
    - **Install stabilizer brackets on the rack cabinet.**
    - **If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.**
  - **If a long distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also, lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.**

**(R002)**

## Product recycling and disposal

Refer to the *IBM Systems Environmental Notices and User Guide* (Z125-5823) for translated environmental statements and information regarding product recycling and disposal. This document may be provided either in printed version or on the product documentation CD. A more current version may be available through this link ftp://public.dhe.ibm.com/systems/support/warranty/envnotices/environmental_notices_and_user_guide.pdf

# Preface

This document is intended for use by systems administrators and technicians experienced with networking, Fibre Channel, and storage area network (SAN) technologies. It describes how to install, service, and use the IBM Storage Networking SAN128B-6 (machine type-models 8960-F96 and 8960-N96 Switch). Throughout this document, the product is referred to as the SAN128B-6, or simply the switch.

This document has been created to include information specific to SAN128B-6 switches running on Fabric OS version 7.1.1 or later. This document does not support all Fabric OS versions. It is specific to Fabric OS v7.1.1 or later. Refer to the Fabric OS Release Notes for more information.

## Product documents

The following documents contain information related to this product. The documentation may be printed material or may be on the documentation CD that is shipped with the product.

- *IBM Storage Networking SAN128B-6 Installation, Service, and User Guide*, TBD (this document)
- *IBM Storeage Networking SAN128B-6 Quick Start Guide*, TBD
- Safety Notices
- *IBM Systems Environmental Notices and User Guide*, Z125-5823
- *Warranty Information*, 45W6626

Newer versions of product documentation may be available through the IBM Publications Center website www.ibm.com/shop/publications/order. Search by publication title or publication number.

Newer versions may also be available through the IBM Support Portal www.ibm.com/supportportal. Enter your product machine type (8960) or product name in the search field, and then select **Documentation** from the displayed page.

## Brocade documents

IBM b-type switches use software licensed from Brocade Communications Systems, Inc. You can find information related to the software that supports the switch in the following documents on the CD-ROM supplied with this product:

**Brocade Fabric OS**

- *EZSwitchSetup Administrator's Guide*
- *Fabric OS Administrator's Guide*
- *Fabric OS Command Reference Manual*
- *Fabric OS MIB Reference Manual*
- *Fabric OS Message Reference Manual*
- *Fabric OS Troubleshooting and Diagnostics Guide*

**Brocade Fabric OS optional features**

- *Fabric Watch Administrator's Guide*
- *Web Tools Administrator's Guide*

## IBM and Brocade product matrix

The product matrix provides a cross-reference between the comparable IBM and Brocade product models.

When you use any of the Brocade documents, such as Fabric Operating System (FOS) publications, you will notice that the model numbers reflect the corresponding Brocade products. Table 1 provides a product matrix to correlate the Brocade products and models to the IBM product names and machine types and model numbers. Products withdrawn from marketing are not listed.

*Table 1. Brocade and IBM product and model number matrix*

| **Brocade product name** | **IBM product name** | **IBM machine type and model number** |
|---|---|---|
| Brocade G630 | SAN128B-6 | 8960 Models F96 and N96 |
| Brocade G620 | SAN64B-6 | 8960 Models F64 and N64 |
| Brocade G610 | SAN24B-6 | 8960 Models F24 |
| Brocade X6-4 Director | SAN256B-6 | 8961 Model F04 |
| Brocade X6-8 Director | SAN512B-6 | 8961 Model F08 |
| Brocade 6520 | SAN96B-5 | 2498 Models F96 and N96 |
| Brocade 6505 | SAN24B-5 | 2498 Model F24, 249824G |
| Brocade 6510 | SAN48B-5 | 2498 Model F48 |
| Brocade DCX 8510-4 | SAN384B-2 | 2499 Model 416 |
| Brocade DCX 8510-8 | SAN768B-2 | 2499 Model 816 |
| Brocade 7800 | SAN06B-R | 2498 Model R06 |
| Brocade 7840 | SAN42B-R | 2498 Model R42 |
| Brocade 300 | SAN24B-4 | 2498 Models B24 and 24E |

# Device Overview

The IBM SAN128B-6 offers the following features and capabilities:

- Up to 96 auto-sensing ports supporting high-performance 32-Gbps SFP+ ports technology in a single domain with NVMe support on egress-only.
- Up to eight auto-sensing 128-Gbps (4 x 32-Gbps) QSFP ports to connect to the QSFP ports of other devices or F_Ports.
- Dynamic Ports on Demand (Dynamic-POD) scaling from a base configuration of 48 ports to 128 ports (two 24-port SFP+ PODs and one 32-port QSFP POD).
- 4-, 8-, 16-, and 32-Gbps auto-sensing Fibre Channel switch and router ports.
  - A 32-Gbps optical transceiver can auto-negotiate to 32 Gbps, 16 Gbps, or 8 Gbps.
  - A 16-Gbps optical transceiver can auto-negotiate to 16 Gbps, 8 Gbps, or 4 Gbps.
  - A 10-Gbps FC optical transceiver can support 10 Gbps speed.

  **Note:** The port speed is determined by the maximum speed supported by the optical transceiver at the other end of the link.
- Universal ports self-configure as a E_Ports, F_Ports, or D_Ports. EX_Ports can be activated on a per-port basis with the optional Integrated Routing license.
  - Diagnostic D_Port mode provides diagnostics, troubleshooting, and verification services for the physical media.
- Up to 384 Gbps of combined in-flight data encryption/decryption and 192 Gbps of combined in-flight compression/decompression capabilities per switch.
- Dynamic buffer sharing
- Support for nonport-side intake or nonport-side exhaust airflow for cooling.
- Hardware-enabled input and output (I/O) latency statistics collection.
- Hardware-enabled VM support.
- Brocade small form-factor pluggable plus (SFP+) optical transceivers support any combination of Short Wavelength (SWL), Long Wavelength (LWL) or Extended Long Wavelength (ELWL) optical media among the switch ports.
- Extended distance Fibre Channel to support long distance native FC connectivity.
- Port-to-port latency is minimized to 900 nanoseconds (including FEC) by using cut-through frame switching at 32 Gbps.
- High performance T1042E processor with four cores operating at 1.5 GHz delivers high performance, scalability, and advanced Fabric Vision functionality.
- One 10/100/1000 Mbps RJ45 connector Ethernet port for management connection. In conjunction with EZSwitchSetup, this port supports switch IP address discovery and configuration, eliminating the need to attach a serial cable to configure the switch IP address.
- One RS-232 3-wire (Tx, Rx, and Gnd) universal asynchronous receiver/transmitter (UART) serial port to BMC with RJ-45 connector for debugging initial switch setup (if not using EZSwitchSetup) and factory default restoration. Integral LEDs remain unlit at all times.
- One internal e-USB module provides 2 GB of persistent storage, increased serviceability, and error logging functionality by facilitating easier firmware upgrades and downloads of the system log files.
- One external USB Type A connector.
- Two hot-swappable redundant power supply field-replaceable units.
- Three hot-swappable redundant fan assembly field-replaceable units.
- 128 bicolor (green/amber) LEDs to indicate the status for each port.

- One green LED to indicate valid system power.
- One bicolor (green/amber) LED to indicate the system status.
- Two Ethernet LEDs: one bicolor (green/amber) LED to indicate link at 1000/100/10 Mbps and one green LED to indicate activity.
- SEEPROM for switch identification.
- Real-time power monitoring.
- Real-time voltage monitoring.
- Real-time fan monitoring including airflow direction.
- Real-time digital thermometers for temperature monitoring.
- Real-time clock (RTC) with battery.

## License options

The SAN128B-6 uses a capacity-based Ports on Demand (POD) license method. An Integrated Routing (IR) license is required to enable EX_Port functionality on this device. Refer to the *Fabric OS Software Licensing Guide* for more details.

## Port-side view

The following illustration shows the port-side view of the SAN128B-6 Fibre Channel switch.

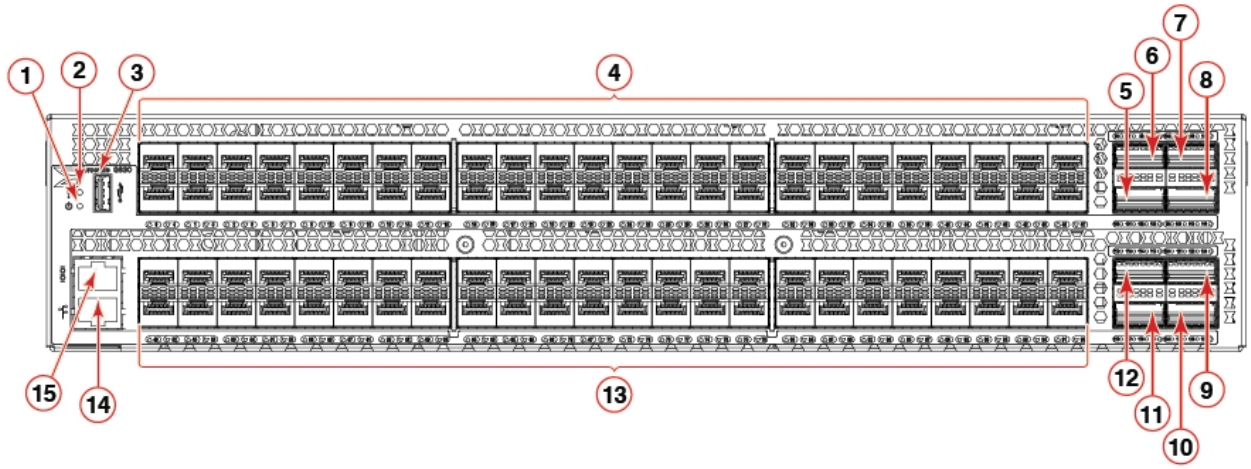



*Figure 1. Port-side view*

1. System power LED
2. System status LED
3. USB port
4. 48 SFP+ 32-Gbps FC ports
5. QSFP port 1 ( FC ports 100 - 101 - 102 - 103 )
6. QSFP port 0 ( FC ports 96 - 97 - 98 - 99 )
7. QSFP port 2 ( FC ports 104 - 105 - 106 - 107 )
8. QSFP port 3 ( FC ports 108 - 109 - 110 - 111 )
9. QSFP port 6 ( FC ports 120 - 121 - 122 - 123 )
10. QSFP port 7 ( FC ports 124 - 125 - 126 - 127 )
11. QSFP port 5 ( FC ports 116 - 117 - 118 - 119 )

12. QSFP port 4 ( FC ports 112 - 113 - 114 - 115 )
13. 48 SFP+ 32-Gbps FC ports
14. 10/100/1000 Mbps RJ-45 Ethernet management port
15. UART RJ-45 serial console port

*Table 2. SFP+ ports numbering*

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 8 | 9 | 10 | 11 | | 16 | 17 | 18 | 19 | 24 | 25 | 26 | 27 | | 32 | 33 | 34 | 35 | 40 | 41 | 42 | 43 |
| 4 | 5 | 6 | 7 | 12 | 13 | 14 | 15 | | 20 | 21 | 22 | 23 | 28 | 29 | 30 | 31 | | 36 | 37 | 38 | 39 | 44 | 45 | 46 | 47 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 48 | 49 | 50 | 51 | 56 | 57 | 58 | 59 | | 64 | 65 | 66 | 67 | 72 | 73 | 74 | 75 | | 80 | 81 | 82 | 83 | 88 | 89 | 90 | 91 |
| 52 | 53 | 54 | 55 | 60 | 61 | 62 | 63 | | 68 | 69 | 70 | 71 | 76 | 77 | 78 | 79 | | 84 | 85 | 86 | 87 | 92 | 93 | 94 | 95 |

*Table 3. QSFP ports numbering*

| | |
|---|---|
| QSFP port 0 ( FC ports 96 - 97 - 98 - 99 ) | QSFP port 2 ( FC ports 104 - 105 - 106 - 107 ) |
| QSFP port 1 ( FC ports 100 - 101 - 102 - 103 ) | QSFP port 3 ( FC ports 108 - 109 - 110 - 111 ) |
| | |
| QSFP port 4 ( FC ports 112 - 113 - 114 - 115 ) | QSFP port 6 ( FC ports 120 - 121 - 122 - 123 ) |
| QSFP port 5 ( FC ports 116 - 117 - 118 - 119 ) | QSFP port 7 ( FC ports 124 - 125 - 126 - 127 ) |

## Nonport-side view

The following illustration shows the nonport-side view of the SAN128B-6 FC switch.

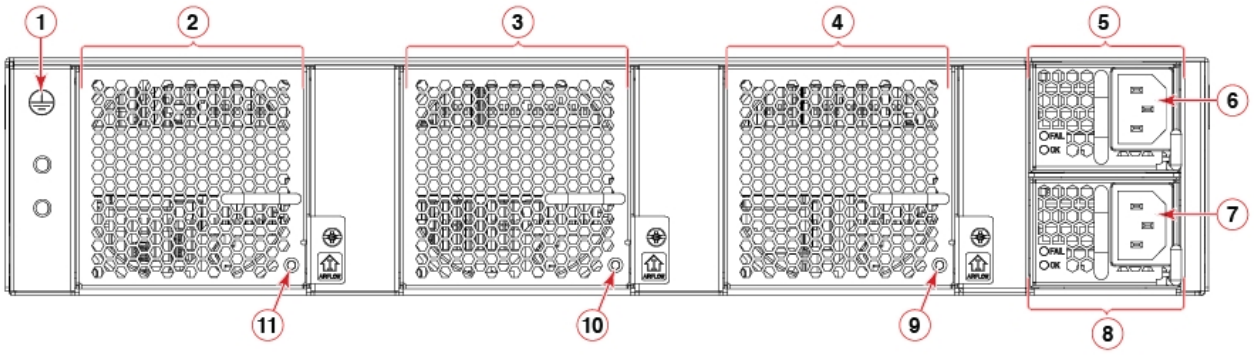



*Figure 2. Nonport-side view with AC power supply and fan assembly units*

1. Ground cable connector
2. Fan assembly unit 1
3. Fan assembly unit 2
4. Fan assembly unit 3
5. Power supply unit 1
6. Power supply receptacle 1
7. Power supply receptacle 2
8. Power supply unit 2
9. Fan assembly unit 3 status LED
10. Fan assembly unit 2 status LED

11. Fan assembly unit 1 status LED

## Device management options

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

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

*Table 4. Management options for the device*

| Management tool | Out-of-band support | Reference documents |
|---|---|---|
| Command line interface (CLI)<br><br>Up to two admin sessions and four user sessions simultaneously. | Ethernet or serial connection | *Fabric OS Administration Guide*<br><br>*Fabric OS Command Reference* |
| EZSwitchSetup<br><br>EZSwitchSetup helps to complete the basic configuration for single-switch setup. | Ethernet or serial connection | *EZSwitchSetup Software Installation Guide*<br><br>*EZSwitchSetup Administrator's Guide* |
| Web Tools | Ethernet or serial connection | *Web Tools Administration Guide* |
| Standard SNMP applications | Ethernet or serial connection | *Fabric OS MIB Reference* |
| Management Server | Ethernet or serial connection | *Fabric OS Administration Guide*<br><br>*Fabric OS Command Reference* |
| IBM Network Advisor (NA)<br><br>NA must be purchased separately. | Ethernet or serial connection | IBM Network Advisor documentation set |

# Preparing for the Installation

Use the following precautions and requirements for successful installation and operation of the switch.

## Safety precautions

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

## General precautions

**DANGER**

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

**DANGER**

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

**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.**

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

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

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

**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:**
**Never leave tools inside the chassis.**

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

**CAUTION:**
**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.**

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

## ESD precautions

**Attention:** Many of the field replaceable units (FRUs) are sensitive to electrostatic discharge (ESD), and can potentially be damaged by improper handling. When working with any FRU, use correct ESD precautions:

- Attach ground to the indicated area on the chassis
- Wear a wrist grounding strap connected to chassis ground (if the switch is plugged in) or a bench ground.

  **Note:** For safety reasons, the ESD wrist strap should contain a series 1 megaohm resistor.
- Store ESD-sensitive components in antistatic packaging

**DANGER**

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

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

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

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

## Power precautions

**DANGER**

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

**DANGER**

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

**DANGER**

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

**DANGER**

**Remove both power cords before servicing.**

**DANGER**

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

**DANGER**

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

**DANGER**

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

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

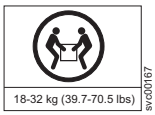
**CAUTION:**
**Ensure that the device does not overload the power circuits, wiring, and over-current protection. To determine the possibility of overloading the supply circuits, add the ampere (amp) ratings of all devices installed on the same circuit as the device. Compare this total with the rating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

**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.**

**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.**

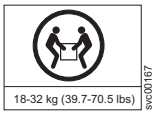
**Note:** Device control processors and management modules may contain batteries for RTC or NVRAM backup. Dispose of components containing batteries as required by local ordinances and regulations.

## Lifting and weight-related precautions



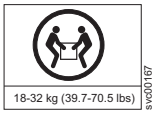

**DANGER**

**Use safe lifting practices when moving the product.**



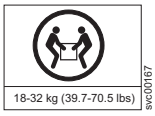

**DANGER**

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

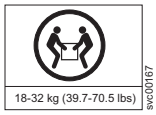



**DANGER**

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




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




**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.**

## Laser precautions


**DANGER**

**All fiber-optic interfaces use Class 1 lasers.**


**DANGER**

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

## Facility requirements

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

*Table 5. Facility requirements*

| Type | Requirements |
|---|---|
| Electrical | • Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the switch nameplate<br>• Circuit protected by a circuit breaker and grounded in accordance with local electrical codes<br>Refer to the Technical Specifications at the end of this guide for complete power supply specifications. |
| Thermal | • A minimum airflow of 79.8 cubic meters/hour (47 cubic ft/min.) available in the immediate vicinity of the switch<br>**Note:** Although this airflow may exceed the airflow maximum listed in the device Technical Specifications, the additional airflow is recommended to pressurize the inlet (cool isle) side of rack installations relative to the exhaust side to minimize recirculation of hot air back to the inlet side.<br>• Ambient air temperature not exceeding 40°C (104°F) while the switch is operating |
| Rack (when rack-mounted) | • Two rack unit (2U) in a 48.3 cm (19-inch) rack<br>• All equipment in the rack grounded through a reliable branch circuit connection<br>• Additional weight of switch not to exceed the rack's weight limits<br>• Rack secured to ensure stability in case of unexpected movement |

# Quick installation checklist

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

## Pre-installation tasks

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

*Table 6. Installation prerequisites*

| Task | Task details or additional information | Completed |
|---|---|---|
| Unpack the device. | Take an inventory of the hardware components included in your shipment. Refer to "Shipping carton contents" on page 12. | |
| Gather necessary components and required tools. | Review the time and items required information at the beginning of each chapter to ensure you have gathered all necessary components required for the following installation tasks:<br>• "Mounting the switch" on page 13<br>• "Power Supply Assemblies" on page 57<br>• "Fan Assemblies" on page 65<br>• "Installing Transceivers and Cables" on page 45 | |
| Review the safety precautions. | Refer to "Safety precautions" on page 5. For translations, refer to "Cautions" on page xi at the end of this guide. | |
| Plan the installation. | Decide whether you want to install the unit on a flat surface or in a rack. For rack installation, obtain the appropriate rack mount kit. Refer to "Mounting the switch" on page 13. | |
| Review and verify installation requirements. | Verify that the following requirements are met. Refer to "Facility requirements" on page 9.<br>• Power requirements<br>• Environmental requirements<br>• Clearance for standalone or rack installation | |
| Gather network configuration parameters. | • IP address:<br>• Subnet mask:<br>• Default gateway:<br>• Domain ID:<br>• Time zone: | |

## Installation and initial configuration

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

*Table 7. Installation and basic system configuration*

| Task | Task details or additional information | Completed |
|---|---|---|
| Mount the device. | Choose one of the following mounting options:<br>• Mount the device as a standalone unit. Refer to"Standalone installation" on page 14.<br>• Mount the device in a four-post rack. Refer to"Installing the Universal Four-Post Rack Kit" on page 14.<br>• Mount the device in a two-post rack. Refer to"Installing the Universal Two-Post Rack Kit" on page 26. | |
| Check the airflow of the power supply and fan assembly | The airflow direction of the power supply and fan should match. The power supplies and fan trays are clearly labeled with either a green arrow with an "E", or an orange arrow with an "I." For more details, refer to "Identifying the airflow direction" on page 58. | |
| Gather all components required for the initial setup. | Refer to "Items required" on page 37. | |
| Provide power to the device. | Refer to "Providing power to the device" on page 37. | |
| Attach a management station, establish a serial connection, and change the default passwords (optional). | Refer to "Establishing a first-time serial connection" on page 37. After completing this task, log in to the serial port to configure the device. | |
| Set the IP address, subnet mask, and the default gateway IP address. | Use the **ipaddrset** command to configure a static device IP address, subnet mask, and gateway IP address, or you can use a DHCP server to obtain the information dynamically. Refer to "Configuring the IP address" on page 38. | |
| Set the date and time. | • Use the **date** command to display and set the date and time.<br>• Use the **tstimezone** command to display and set the time zone.<br>• Use the **tsclockserver** command to synchronize the time with an external NTP server.<br>Refer to "Setting the date and time" on page 39 for more information. | |
| Customize the switch name and chassis name. | • Use the **swicthname** command to change the default switch name.<br>• Use the **chassisname** command to change the default chassis name.<br>Refer to "Customizing the chassis name and switch name" on page 41 for more information. | |
| Establish an Ethernet connection. | By establishing an Ethernet connection, you can complete the device configuration using a serial session, Telnet, or management application, such as Brocade Network Advisor. Refer to "Establishing an Ethernet connection" on page 41. | |
| Optional: Configure the DNS service. | Use the **dnsconfig** command to create DNS server entries. Refer to the *Brocade Fabric OS Administration Guide*. | |
| Optional: Customize the domain ID. | Use the **configure** command to change the domain ID (default ID is 1). Refer to "Setting the domain ID" on page 41 for more information. | |

*Table 7. Installation and basic system configuration (continued)*

| Task | Task details or additional information | Completed |
|---|---|---|
| Verify that the device operates correctly. | • Check the LEDs to verify operation of functional parts. Refer to"Port-side LED locations" on page 51 and"Nonport-side LED locations" on page 54.<br>• The following commands can be useful to establish an operational baseline for the device. Refer to the*Fabric OS Command Reference* for more information on these commands.<br>– **psshow**<br>– **fanshow**<br>– **tempshow**<br>– **historyshow**<br>– **errdump** | |
| Back up the configuration. | Use the interactive **configupload** command to back up the configuration. Refer to "Verifying correct operation" on page 42 for more information. | |
| Optional: Power off the devices. | Enter the **shutdown** command and wait for the device to power down, and then unplug the power cords. Refer to "Powering down the device" on page 43 for more information. | |

## Shipping carton contents

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

- The SAN128B-6 switch
- An accessory kit containing the following items:
  - A serial cable
  - Two 6-ft. power cords
  - Power cord retainer clips
  - Rubber feet
  - China-RoHS Hazardous/Toxic Substance statement
  - Network Advisor web pointer card.
  - EZSwitch web pointer card
  - Documentation web pointer card
- Inner foam

# Mounting the switch

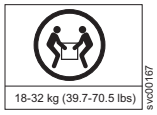
You can install the SAN128B-6 switch in several ways:

- As a standalone unit on a flat surface, for example, a table top. Use the rubber feet included with the shipment to secure the device on the surface. No other equipment is required for desktop installation.
- In a four-post EIA rack: You will need a Universal Four-Post Rack Kit to install devices in EIA racks that are between L-13.7 to 81.28 cm deep (L-5.0 to 32.0 in.), where L is the chassis depth.
- In a two-post Telco rack: You will need a Universal Two-Post Rack Kit to install 2U devices in a two-post telecommunications (Telco) rack.

**Note:** Review the "Precautions specific to mounting" before mounting the switch.

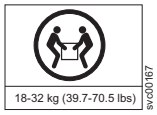
## Precautions specific to mounting

The following precautions specifically apply to mounting the device.




**DANGER**

**Use safe lifting practices when moving the product.**

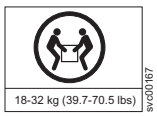



**DANGER**

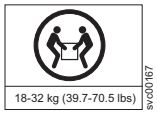
**Mount the devices you install in a rack as low as possible. Place the heaviest device at the bottom and progressively place lighter devices above.**

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

**CAUTION:**
**Never leave tools inside the chassis.**




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




**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.**

## Standalone installation

### About this task

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

### Procedure

1. Unpack the device and verify the items listed under "Shipping carton contents" on page 12 are present and undamaged.
2. Apply the adhesive rubber feet to the underside of the device. The rubber feet help prevent the device from sliding off the supporting surface.
   a. Clean the indentations at each corner of the bottom of the device 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 device on a sturdy flat surface.
4. Provide power to the device as described in "Providing power to the device" on page 37.

   **Note:** Do not connect the device to the network until the IP address is set correctly. For instructions on how to set the IP address, refer to "Configuring the IP address" on page 38.

## Installing the Universal Four-Post Rack Kit

Use the following instructions to install 1U and 2U devices in EIA racks that are between L-12.7 to 81.28 cm deep (L-5.0 to 32.0 in.), where L is the chassis depth, using the Universal Four-Post Rack Kit.

There are two ways you can mount the device in a four-post rack:

- With the port side flush with the front posts.
- With the nonport side flush with the rear posts in a recessed position. A recessed position allows a more gradual bend in the fiber-optic cables connected to the switch and less interference in the aisle at the front of the rack.

*Table 8. Space requirements*

| Chassis with port-side side vents | Notes | Chassis depth | Minimum rack depth | Maximum rack depth |
|---|---|---|---|---|
| No | Applicable to port-side and nonport-side flush mounts. | L | L-12.7 cm (L-5 in.) | 81.28 cm (32 in.) |
| Yes | Applicable to port-side flush mounts. | L | L-12.7 cm (L-5 in.) | 81.28 cm (32 in.) |
| Yes | Applicable to nonport-side flush mounts. | L | L | 81.28 cm (32 in.) |

Note that if chassis depth (L) is less than 40.64 cm (16 in.), the chassis will not fit into a rack with a maximum depth of 81.28 cm (32 in.) using the universal four-post rack kit. The maximum rack depth for a chassis less than 40.64 cm (16 in.) is 81.28 cm (32 in.) minus the difference between the chassis depth and 40.64 cm (16 in.). For example, a chassis with a depth (L) of 35.56 cm (14 in.) is 5.08 cm (2 in.) smaller than 40.64 cm (16 in.), so it will install into a rack with a maximum depth of 81.28 cm (32 in.) - 5.08 cm (2 in.) = 76.2 cm (30 in.).

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 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.

## Time and items required

Allow 15 to 30 minutes to complete the installation.

The following items are required to install the device using the Universal Four-Post Rack Kit:

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

## Parts list

The following parts are provided wit the 1U, 1.5U, and 2U Universal Kit for Four Post Racks Installation.

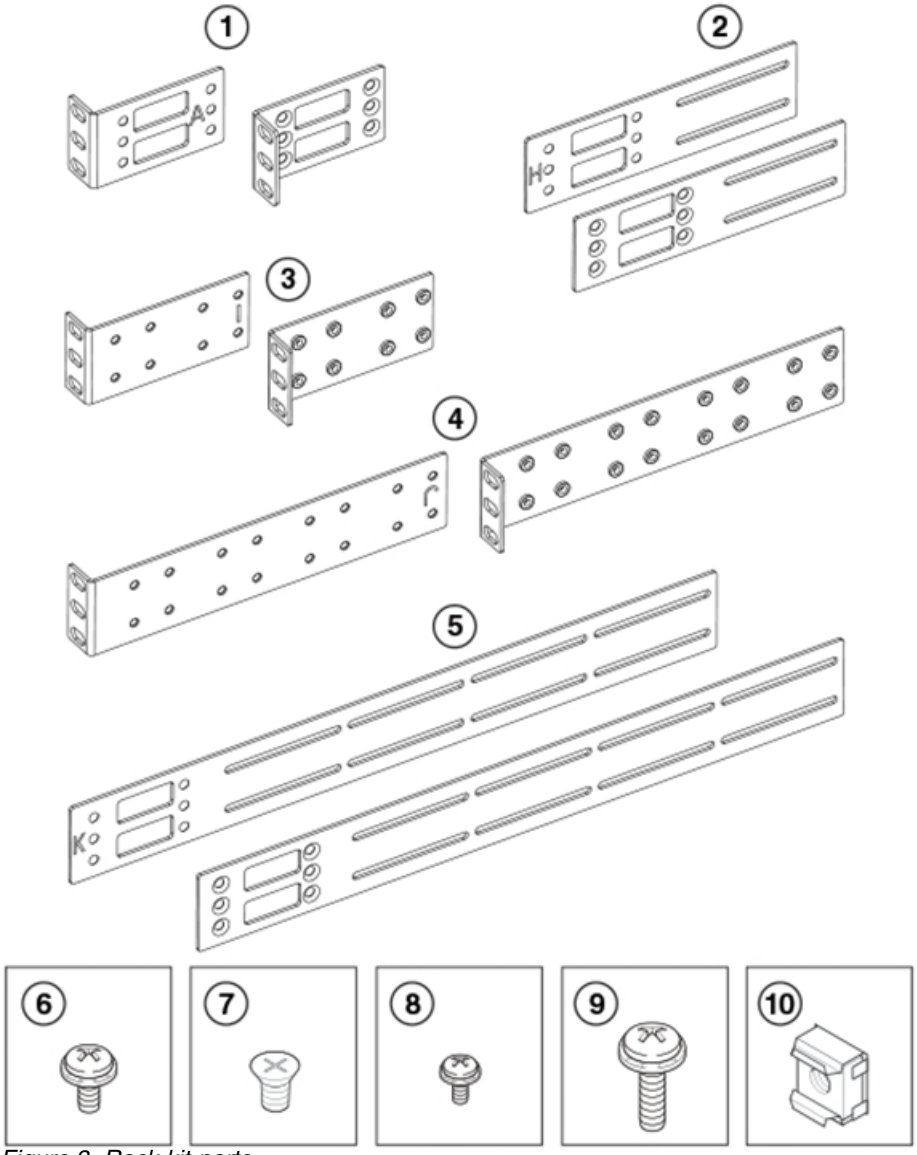


*Figure 3. Rack kit parts*

1. Front brackets (2)
2. Extension brackets, medium (2)
3. Rear brackets, short (2)
4. Rear brackets, long (2)
5. Extension brackets, long (2)
6. Screw, 8-32 x 5/16-in., panhead Phillips (8)
7. Screw, 8-32 x 5/16-in., flathead Phillips (16)
8. Screw, 6-32 x 1/4-in., panhead Phillips (8)
9. Screw, 10-32 x 5/8-in., panhead Phillips (8)
10. Retainer nut, 10-32 (8)

Ensure that the items listed and illustrated are included in the kit. Note that not all parts may be used with certain installations depending on the device type.

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

# Flush-front mounting

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

**Note:** The illustrations in the rack installation procedures are for reference only and may not show the device that you are installing.

Complete the following tasks to install the device in a four-post rack.

1. Attaching the front brackets
2. Attaching the bracket extensions to the device
3. Installing the device in the rack
4. Attaching the rear brackets to the extensions
5. Attaching the rear brackets to the rack posts

## Attaching the front brackets

### About this task

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

### Procedure

1. Position the right front bracket with the flat side against the right side of the device at the front of the device, as shown in Figure 4.
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

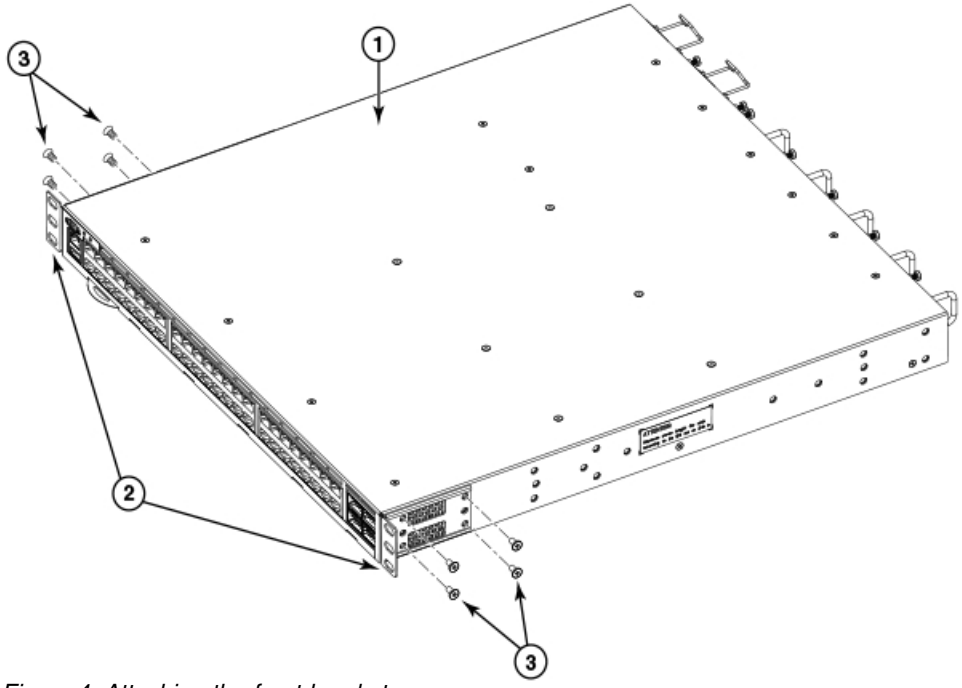



*Figure 4. Attaching the front brackets*

1. The SAN128B-6 device
2. Front brackets

3. Screws, 8-32 x 5/16-in., flathead Phillips

## Attaching the bracket extensions to the device
### About this task

Complete the following steps to attach the extension brackets to the device. There are medium and long extension brackets that you can use for this step.

### Procedure

1. Select the proper length bracket extension for your rack depth.
2. Position the right bracket extension along the side of the device as shown in Figure 5.
3. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket extension and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
4. Repeat step 2 and step 3 to attach the left bracket extension to the left side of the device.
5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

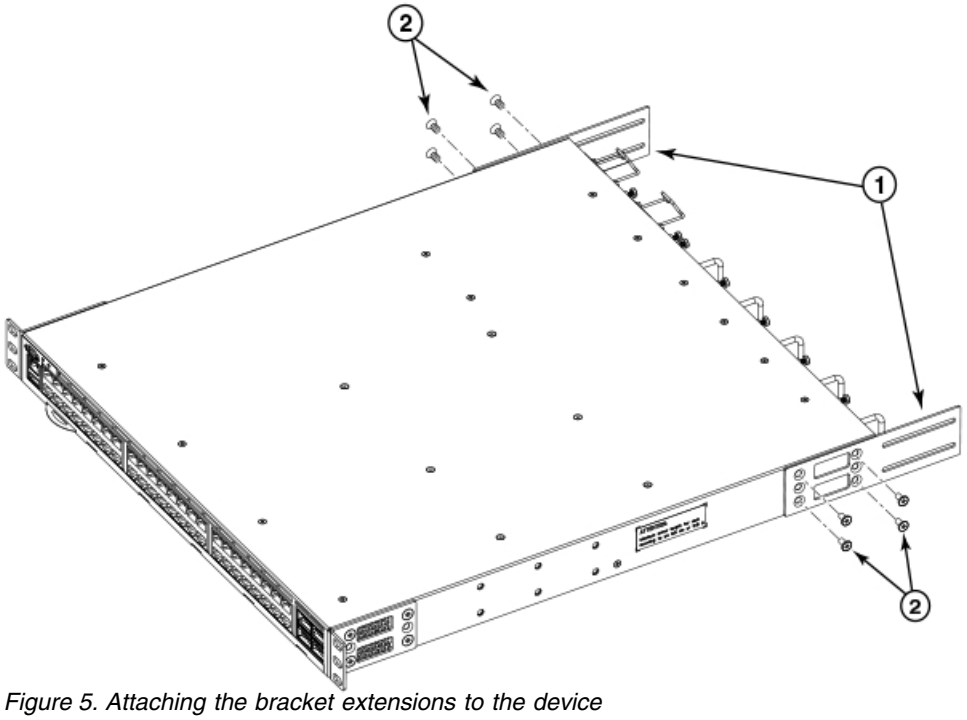



*Figure 5. Attaching the bracket extensions to the device*

Bracket extension

Screws, 8-32 x 5/16-in., flathead Phillips

## Installing the device in the rack
### About this task

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

### Procedure

1. Position the device in the rack, as shown in Figure 6 on page 19, 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. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.

3. Attach the left front bracket to the left front rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

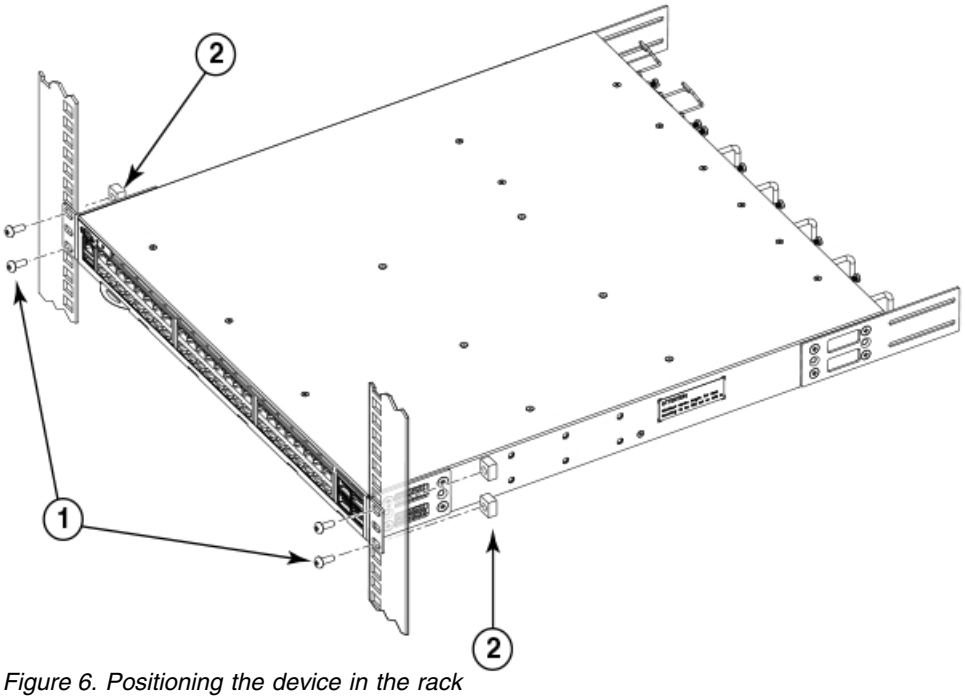



*Figure 6. Positioning the device in the rack*

1. Screws, 10-32 x 5/8-in., panhead Phillips
2. Retainer nuts, 10-32

## Attaching the rear brackets to the extensions

### About this task

Complete the following steps to attach the rear brackets to the extensions. There are short and long rear brackets that you can use for this step. Choose the correct bracket for the depth of your rack.

### Procedure

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right bracket extension, as shown in the following figure.
3. Attach the brackets using four 6-32 x 1/4-in. panhead screws. If possible, leave at least one empty vertical pair of holes between the screws for better support.
4. Repeat step 2 and 3 to attach the left rear bracket to the left bracket extension.
5. Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

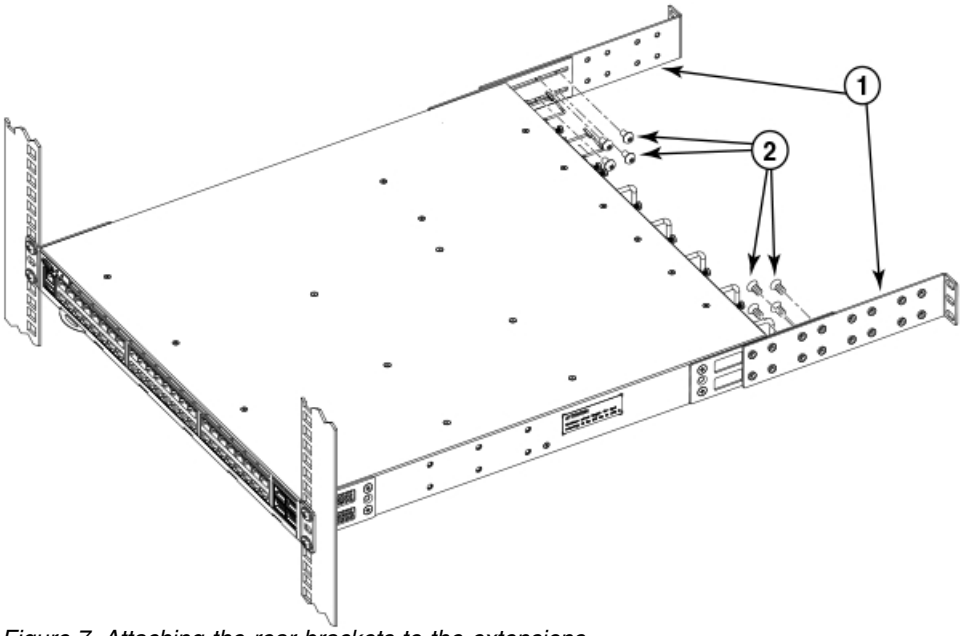



*Figure 7. Attaching the rear brackets to the extensions*

1. Rear brackets
2. Screws, 6-32 x 1/4-in., panhead Phillips

## Attaching the rear brackets to the rack posts

### About this task

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

### Procedure

1. Attach the right rear bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts, as shown in Figure 8 on page 21. Use the upper and lower holes in the bracket.
2. Attach the left rear bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

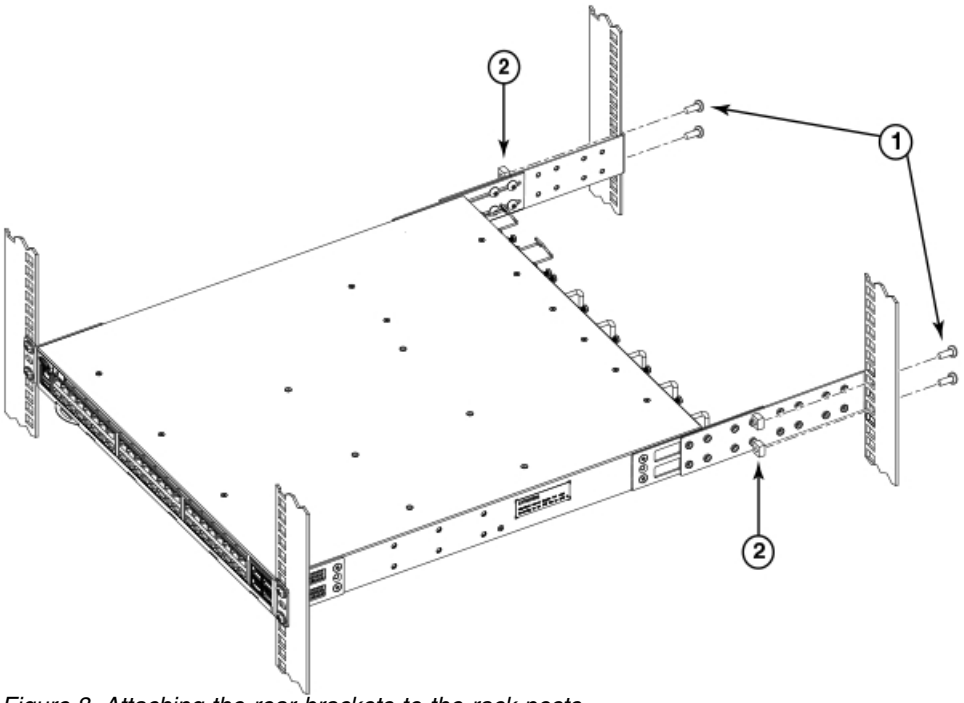



*Figure 8. Attaching the rear brackets to the rack posts*

1. Screws, 10-32 x 5/8-in., panhead Phillips
2. Retainer nuts, 10-32

## Flush-rear (recessed) mounting

The flush-rear (recessed) mounting is similar to the flush-front mounting except that the brackets are reversed on the device.

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

**Note:** The illustrations in the rack installation procedures show a 1U device, but the instructions are the same for a 2U device. The illustrations in the rack installation procedures are for reference only and may not show the actual device.

Complete the following tasks to install the device in a four-post rack:

1. Attaching the front brackets to the rear of the device
2. Attaching the extensions to the front of the device
3. Installing the device in the rack
4. Attaching the rear brackets to the extensions at the front of the device
5. Attaching the rear brackets to the front rack posts

### Attaching the front brackets to the rear of the device

#### About this task

**Note:** In this installation, the brackets are named as listed in the parts list even though the installation of the brackets is reversed from the flush-front installation.

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

### Procedure

1. Position the right front bracket with the flat side against the right rear side of the device, as shown in Figure 9.
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

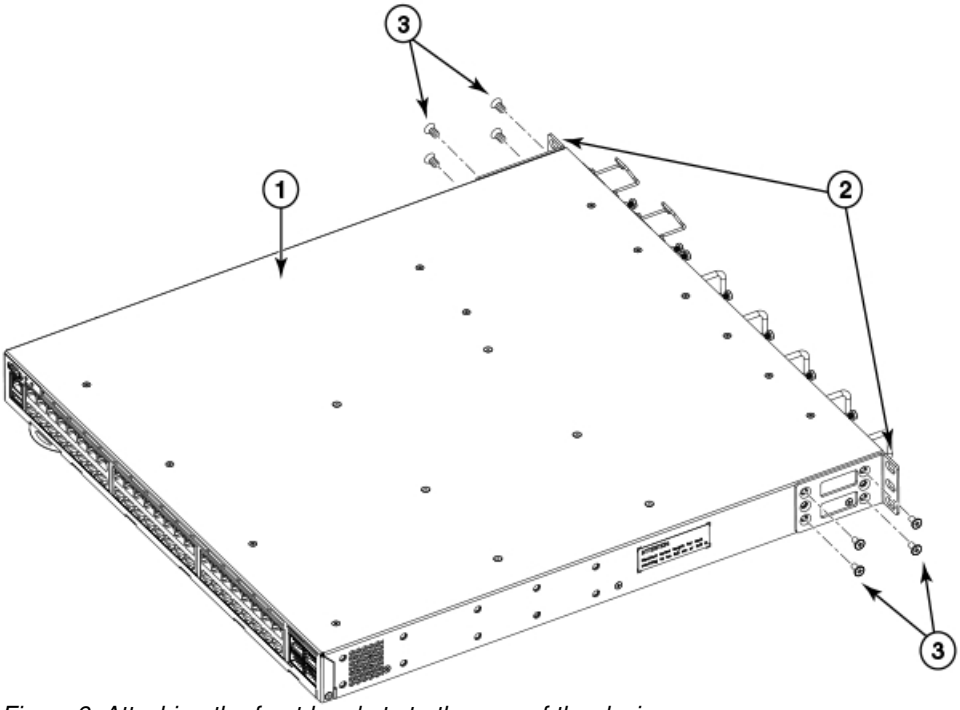



*Figure 9. Attaching the front brackets to the rear of the device*

1. The SAN128B-6 device
2. Front brackets
3. Screws, 8-32 x 5/16-in., flathead Phillips

## Attaching the bracket extensions to the front of the device

### About this task

Complete the following steps to attach the bracket extensions to the front of the device. There are medium and long extension brackets that you can use for this step.

### Procedure

1. Select the proper length extension bracket for your rack depth.
2. Position the right bracket extension along the side of the device as shown in Figure 10 on page 23.
3. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket extension and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
4. Repeat step 2 and step 3 to attach the left front bracket extension to the left side of the device.
5. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

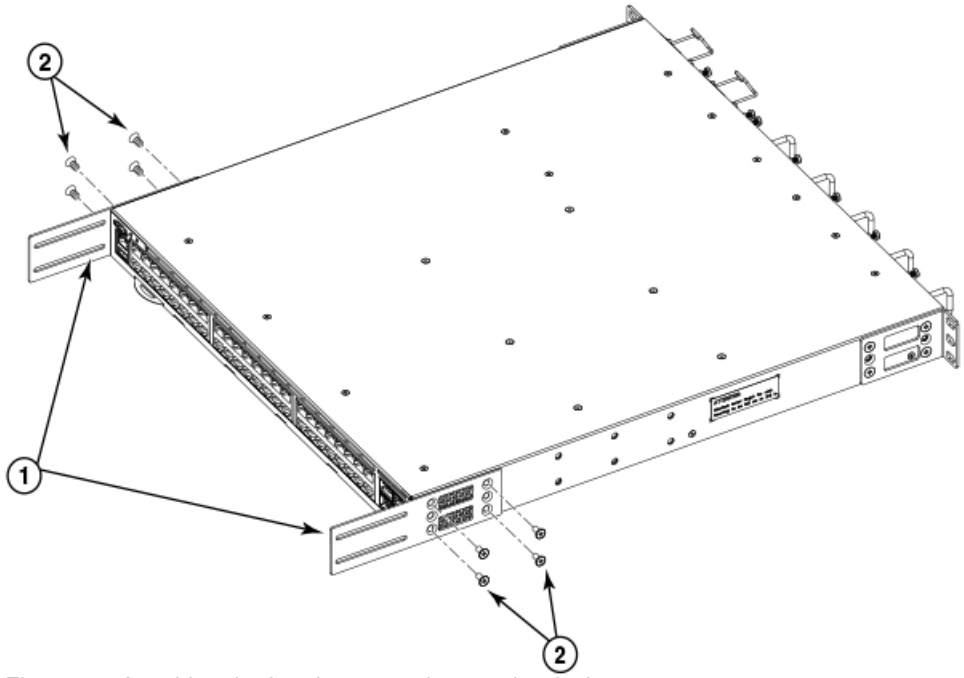



*Figure 10. Attaching the bracket extensions to the device*

1. Extension brackets
2. Screws, 8-32 x 5/16-in., flathead Phillips

## Installing the device in the rack

### About this task

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

### Procedure

1. Position the device in the rack, as shown in Figure 11 on page 24, providing temporary support under the device until the rail kit is secured to the rack.
2. Attach the right front bracket to the right rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left rear rack post using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

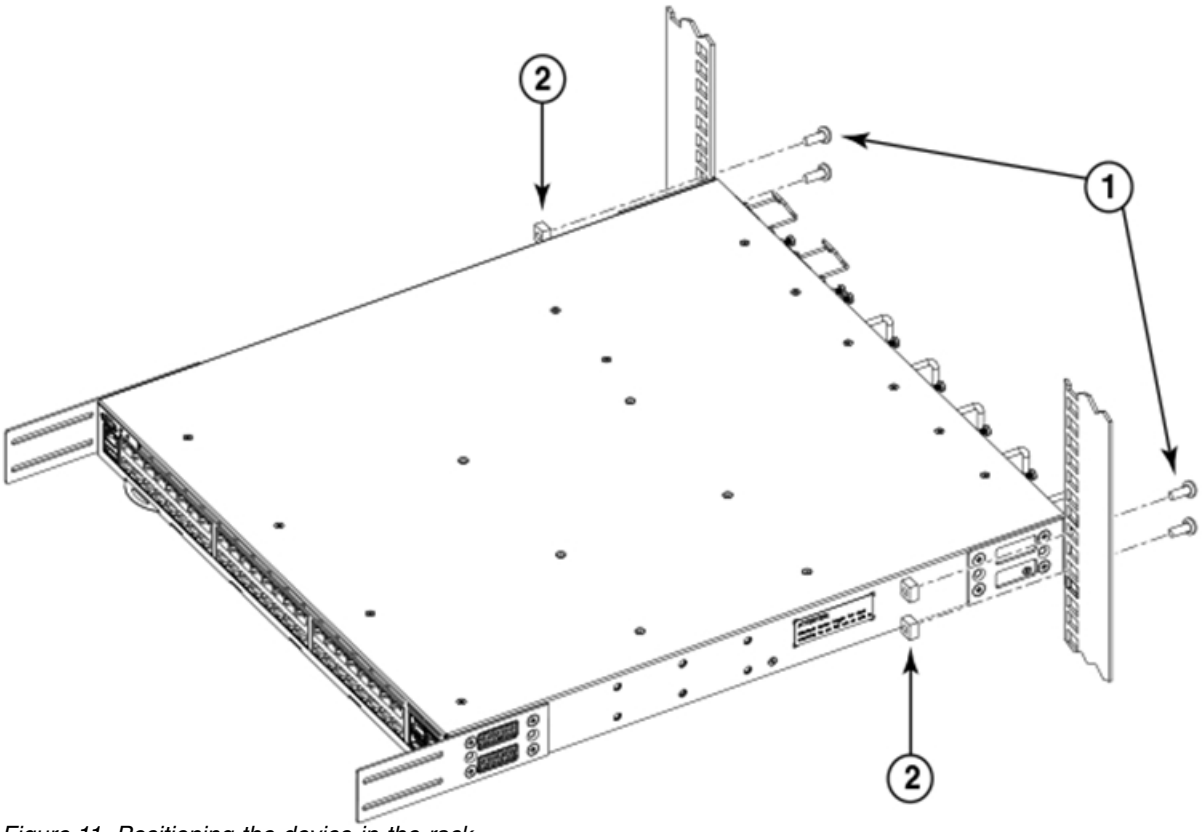



*Figure 11. Positioning the device in the rack*

Screws, 10-32 x 5/8-in., panhead Phillips

Retainer nuts, 10-32

## Attaching the rear brackets to the extensions at the front of the device

### About this task

Complete the following steps to attach the rear brackets to the extensions. There are short and long front brackets that you can use for this step.

### Procedure

1. Select the proper length rear bracket for your rack depth.
2. Slide the right rear bracket onto the right extension.

   The short rear brackets are shown in Figure 12 on page 25. Use the first and third vertical pairs of holes for the screws.

   Refer to Figure 13 on page 25 for the positioning of the short or long brackets and screws.
3. Attach the brackets using four 6-32 x 1/4-in. panhead screws.
4. Repeat step 2 and step 3 to attach the left rear bracket to the left extension.
5. Adjust the brackets to the rack depth and tighten all the 6-32 x 1/4-in. screws to a torque of 9 in-lb (10 cm-kg).

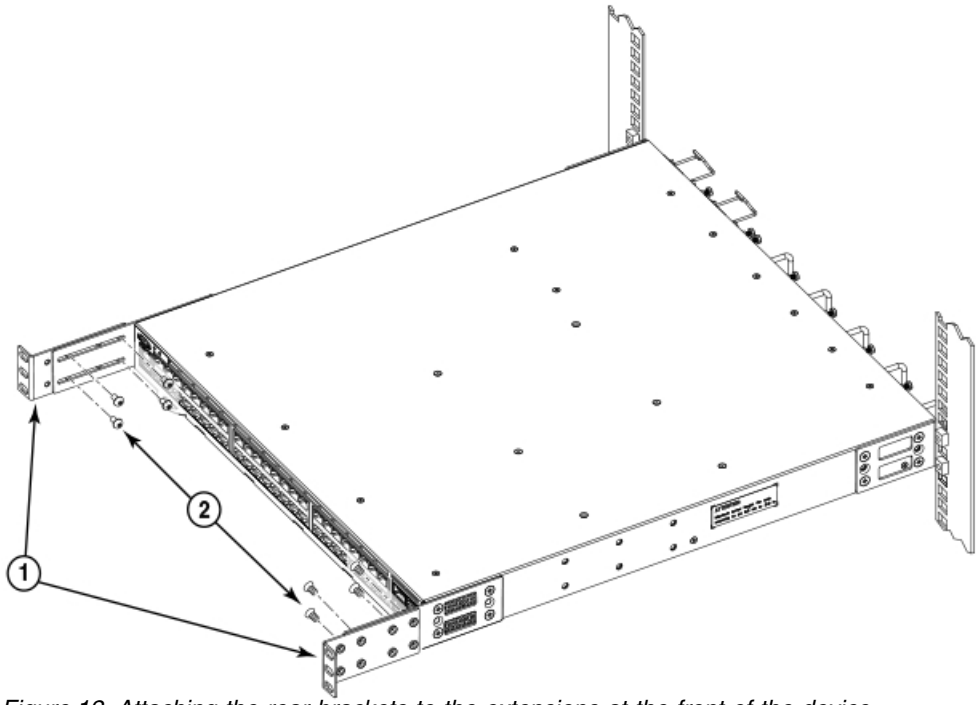



*Figure 12. Attaching the rear brackets to the extensions at the front of the device*

1. Rear brackets, short
2. Screws, 6-32 x 1/4-in., panhead Phillips

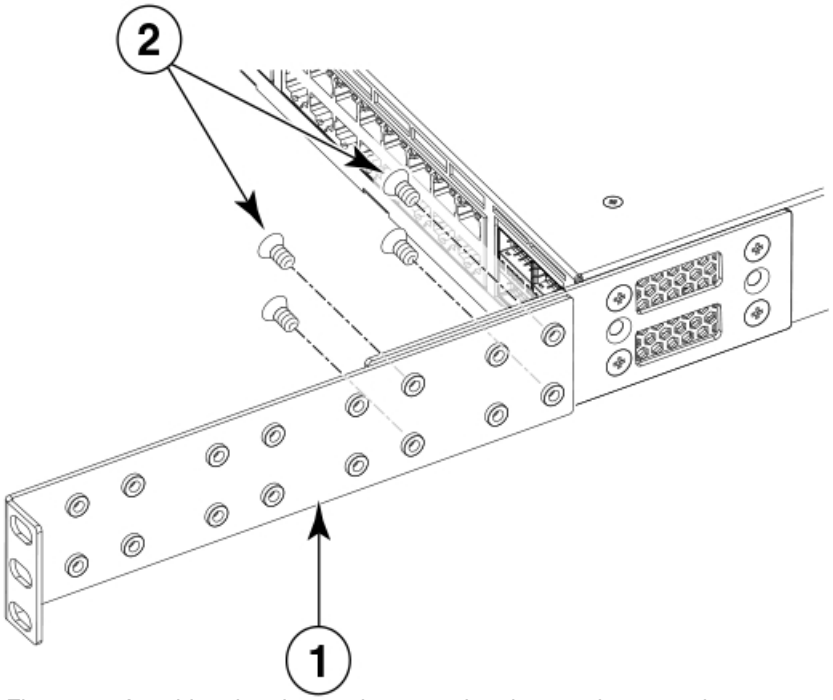



*Figure 13. Attaching the short or long rear brackets to the extensions*

1. Rear bracket, short or long
2. Screws, 6-32 x 1/4-in., panhead Phillips

### Attaching the rear brackets to the front rack posts
### About this task

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

### Procedure

1. Attach the right rear bracket to the right front rack post using two 10-32 x 5/8-in. screws and two retainer nuts, as shown in Figure 14. Use the upper and lower holes in the bracket.
2. Attach the left rear bracket to the left front rack post using two 10-32 x 5/8-in. screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

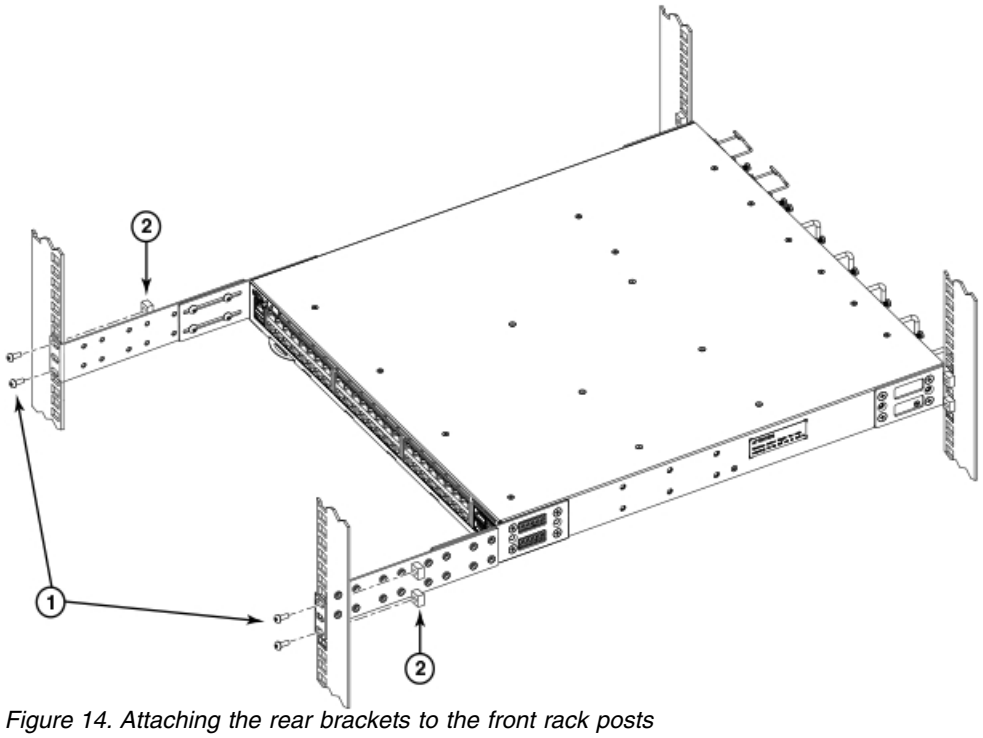



*Figure 14. Attaching the rear brackets to the front rack posts*

1. Screws, 10-32 x 5/8-in., panhead Phillips
2. Retainer nuts, 10-32

## Installing the Universal Two-Post Rack Kit

Use the following instructions to install a Brocade 1U or 2U device in a two-post telecommunications (Telco) rack using the Universal Two-Post Rack Kit.

There are two ways you can mount the device in a two-post rack:

- With the port side flush with the front posts
- With the posts mounted to the mid-section of the device

Observe the following when mounting this device:

- Two people are required to install the device in a rack. One person should hold the device, while the other 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.

## Time and items required

Allow 15 to 30 minutes to complete the installation.

The following items are required to install the device using the Universal Two-Post Rack Kit:

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

## Parts list

The following parts are provided with the Universal Two-Post Rack Kit Installation.

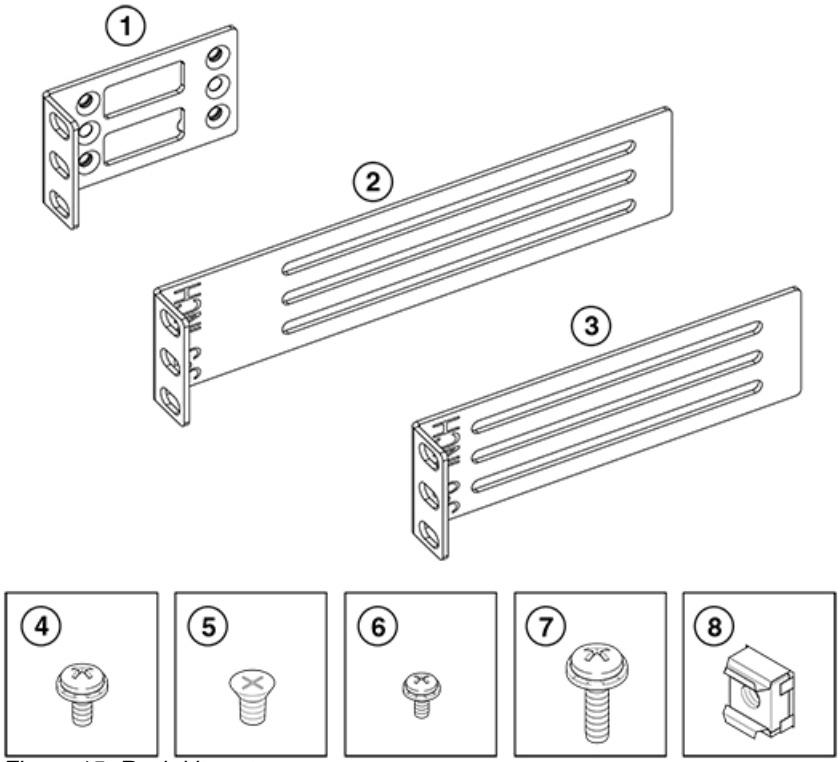



*Figure 15. Rack kit parts*

1. Front brackets (2)
2. Rear brackets, 3-5 inch post (2)
3. Rear brackets, 5-6 inch post (2)
4. Screw, 8-32 x 5/16-in., panhead Phillips (8)
5. Screw, 8-32 x 5/16-in., flathead Phillips (16)
6. Screw, 6-32 x 1/4-in., panhead Phillips (8)
7. Screw, 10-32 x 5/8-in., panhead Phillips (8)
8. Retainer nut, 10-32 (8)

Ensure that the items listed and illustrated above are included in the kit. Note that not all parts may be used with certain installations depending on the device type.

## Flush-front mounting

Observe the following notes when using this procedure:

- The device must be turned off and disconnected from the fabric during this procedure.
- The illustrations in this document show a 1U device, but the instructions are the same for a 2U device.
- The illustrations for this procedure show a two-post rack with narrow posts (3- to 5-inch) as an example.
- The illustrations in the rack installation procedures are for reference only and may not show the actual device.

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

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

1. "Attaching the front brackets to the device"
2. "Attaching the front brackets to the rack" on page 29
3. "Attaching the rear brackets to the rack" on page 30
4. "Attaching the rear brackets to the device" on page 31

### Attaching the front brackets to the device

#### About this task

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

#### Procedure

1. Position the right front bracket with the flat side against the right side of the device, as shown in Figure 16 on page 29.
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

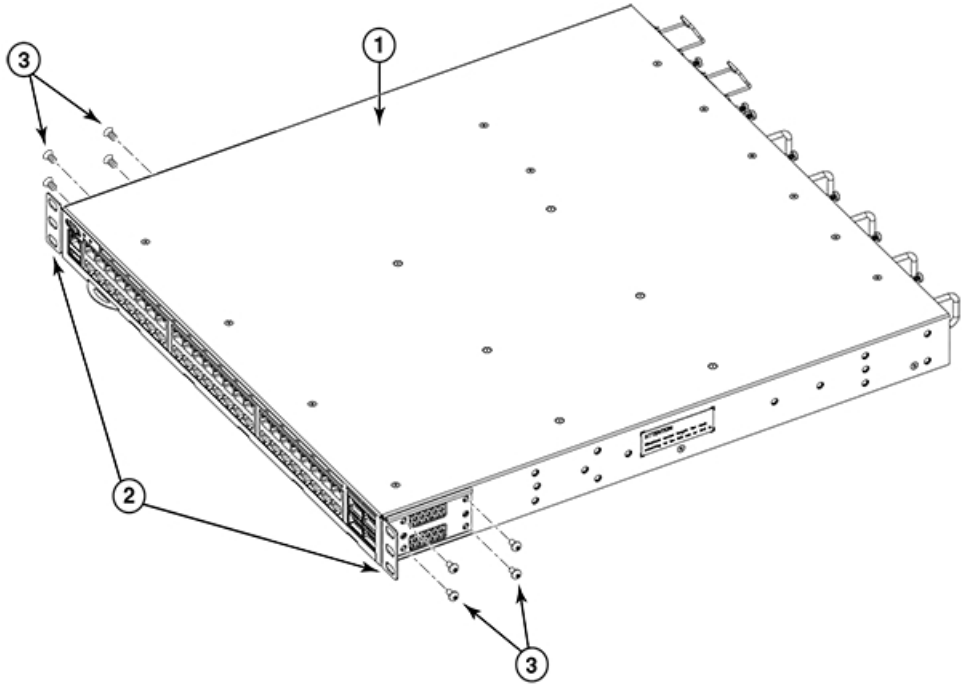



*Figure 16. Attaching the front brackets*

1. The SAN128B-6 device
2. Front brackets, right and left
3. Screws, 8-32 x 5/16-in., flathead Phillips

## Attaching the front brackets to the rack

### About this task

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

### Procedure

1. Position the device in the rack, as shown in (Figure 17 on page 30), providing temporary support under the device until the rack kit is fully secured to the rack.
2. Attach the right front bracket to the right rack upright using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left rack upright using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb. (29 cm-kg).

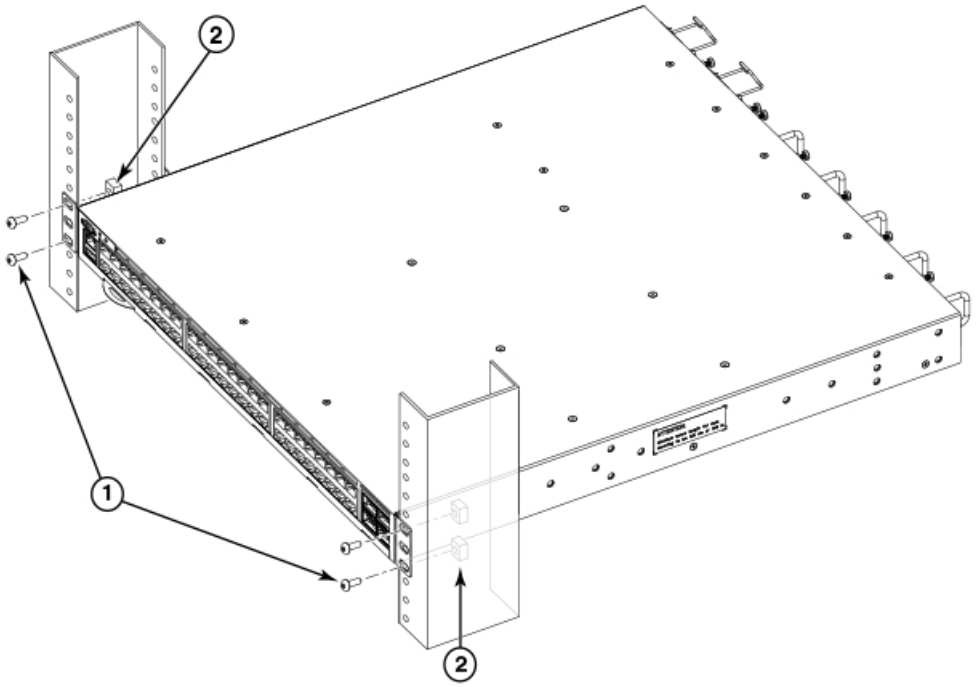



*Figure 17. Attaching front brackets to a rack*

1. Screws, 10-32 x 5/8-in., panhead Phillips
2. Retainer nuts, 10-32

## Attaching the rear brackets to the rack

### About this task

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

### Procedure

1. Select the proper length bracket for your post width. If your posts are three to five inches wide, use the brackets marked 3-5 INCH. If your posts are five to six inches wide, use the brackets marked 5-6 INCH.
2. Position the right rear bracket in the right rear of the device, as shown in Attaching rear brackets to the rack.
3. Attach the bracket to the right rack upright using two 10-32 x 5/8-in. panhead screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Repeat step 2 and step 3 to attach the left rear bracket to the left rack upright.
5. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb. (29 cm-kg).

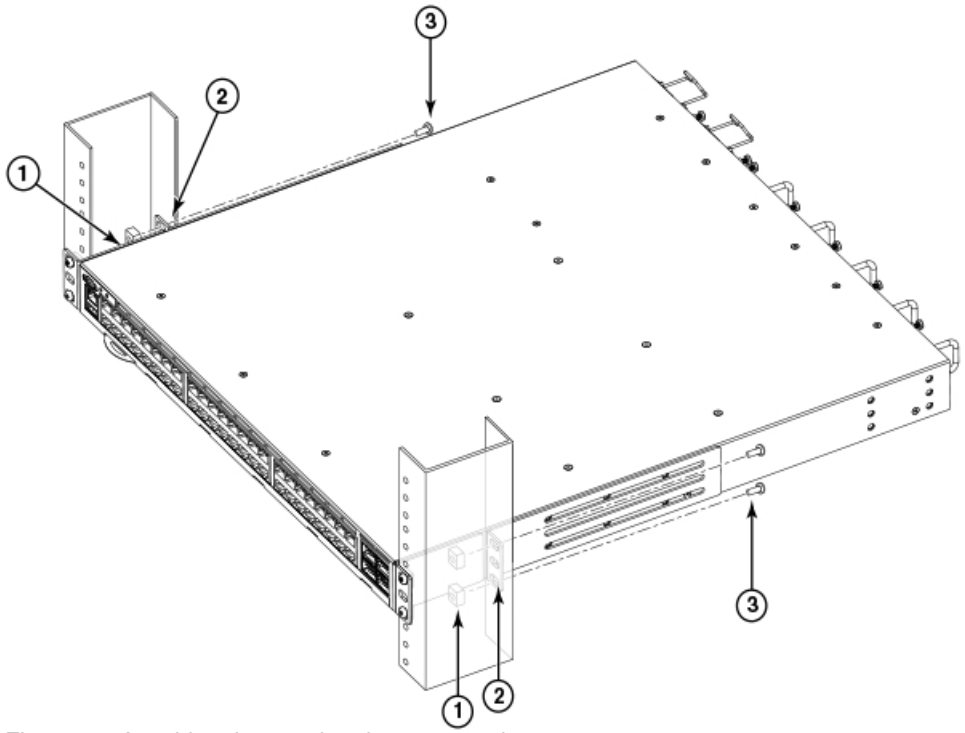



*Figure 18. Attaching the rear brackets to a rack*

1. Retainer nuts, 10-32
2. Rear brackets
3. Screws, 10-32 x 5/8-in., panhead Phillips

## Attaching the rear brackets to the device

### About this task

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

### Procedure

1. Align the right rear bracket to the right rear of the device and use four 8-32 x 5/16-in. panhead screws to attach the bracket to the device, as shown in Figure 19 on page 32. Be sure to insert the screws through the upper and lower slots in the bracket.
2. Align the left rear bracket to the left rear of the device and use four 8-32 x 5/16-in. panhead screws to attach the bracket to the device. Again, use the upper and lower slots in the bracket.
3. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

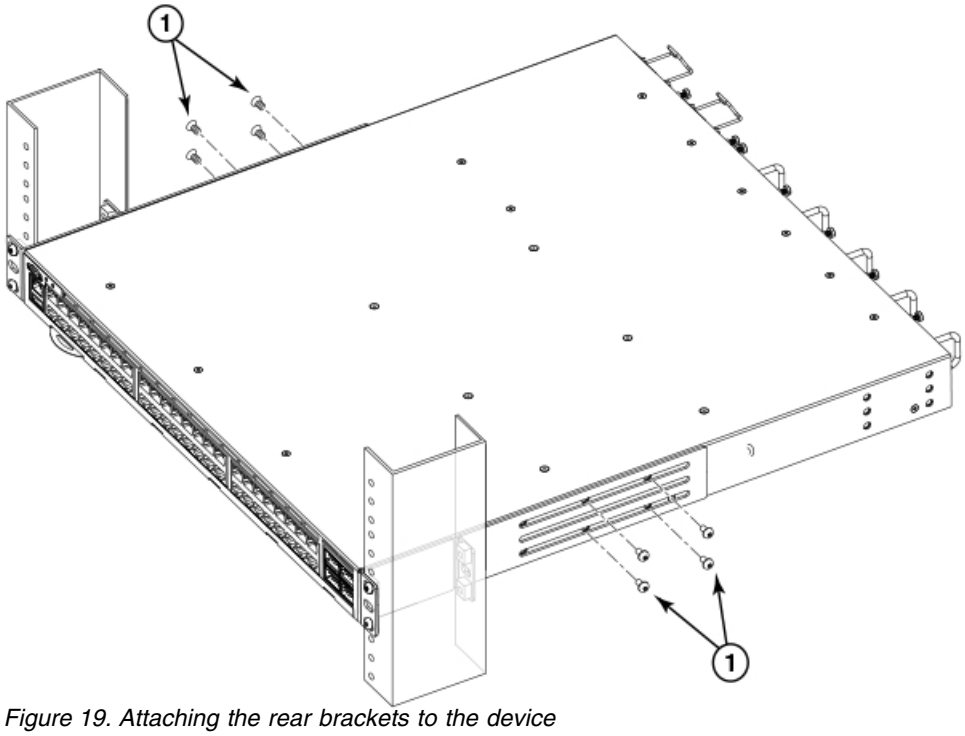



*Figure 19. Attaching the rear brackets to the device*

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

## Mid-mounting

Observe the following notes when using this procedure:

- The device must be turned off and disconnected from the fabric during this procedure.
- The illustrations in this document show a 1U device, but the instructions are the same for a 2U device.
- The illustrations in the rack installation procedures are for reference only and may not show the actual device.

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

1. "Attaching the front brackets to the device"
2. "Attaching the front brackets to the rack" on page 33
3. "Attaching the rear brackets to the rack" on page 34
4. "Attaching the rear brackets to the device" on page 35

### Attaching the front brackets to the device

#### About this task

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

#### Procedure

1. Position the right front bracket with the flat side against the right side of the device, as shown in Figure 20 on page 33.
2. Insert four 8-32 x 5/16-in. flathead screws through the vertically aligned holes in the bracket and then into the holes on the side of the device. Use the upper and lower screw holes, leaving the center holes empty.
3. Repeat step 1 and step 2 to attach the left front bracket to the left side of the device.
4. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

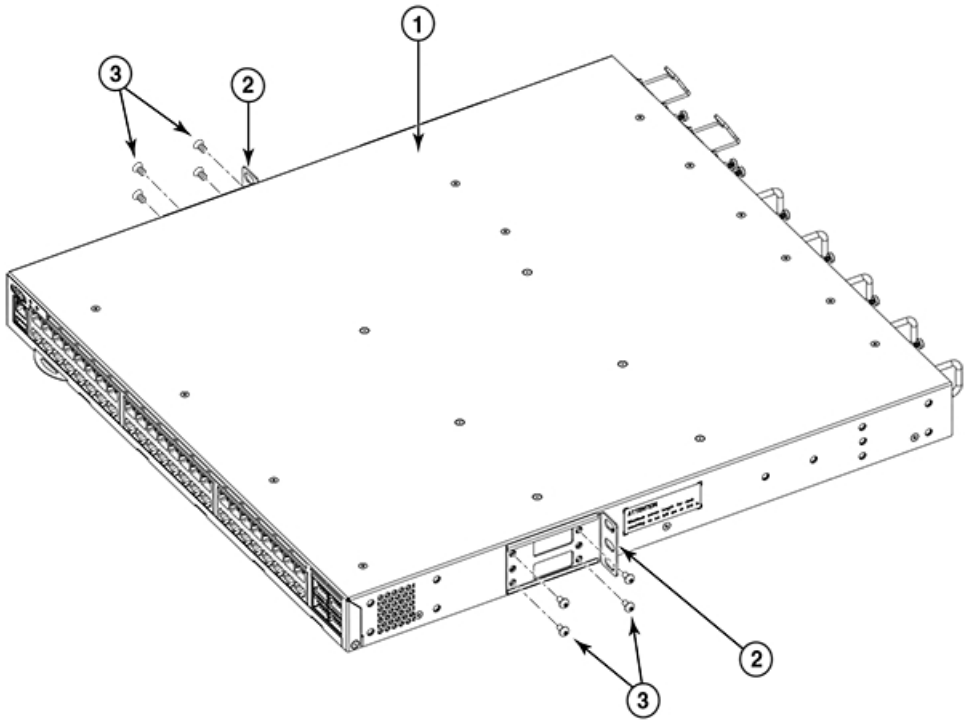



*Figure 20. Attaching the front brackets*

1. The SAN128B-6 device
2. Front brackets, right and left
3. Screws, 8-32 x 5/16-in., flathead Phillips

## Attaching the front brackets to the rack

### About this task

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

### Procedure

1. Position the device in the rack, as shown in Figure 21 on page 34, providing temporary support under the device until the rack kit is fully secured to the rack.
2. Attach the right front bracket to the right rack upright using two 10-32 x 5/8-in. screws and two retainer nuts. Use the upper and lower holes in the bracket.
3. Attach the left front bracket to the left rack upright using two 10-32 x 5/8-in. screws and two retainer nuts. Use the upper and lower holes in the bracket.
4. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

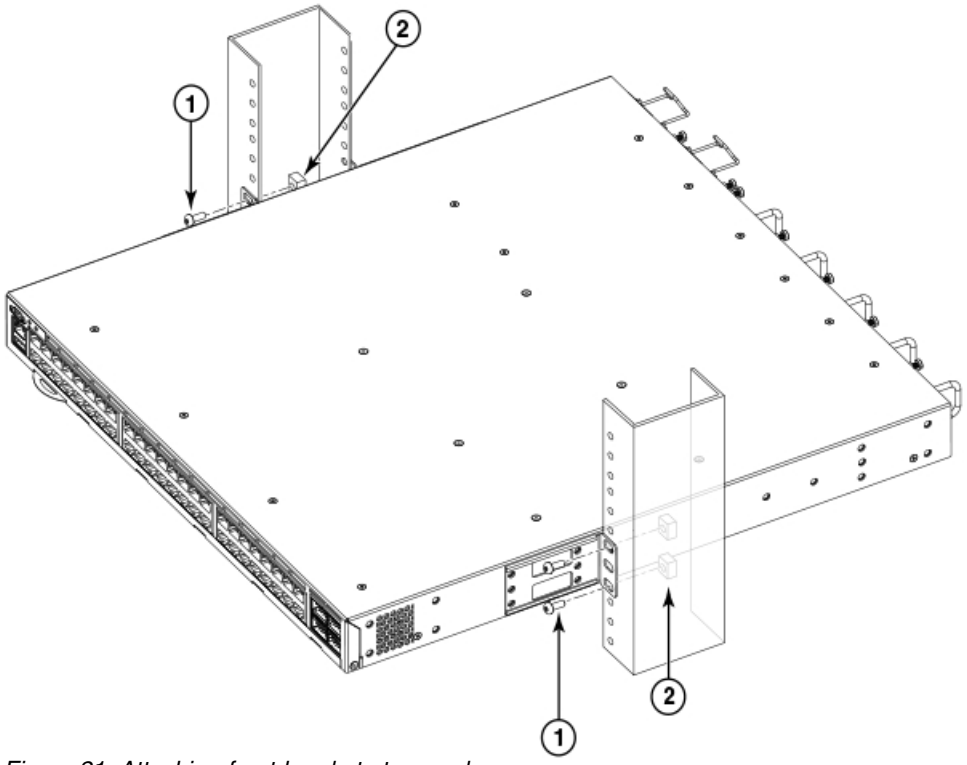



*Figure 21. Attaching front brackets to a rack*

1. Screws, 10-32 x 5/8-in., panhead Phillips
2. Retainer nuts, 10-32

## Attaching the rear brackets to the rack

### About this task

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

### Procedure

1. Select the proper length bracket for your post width. If your posts are three to five inches wide, use the brackets marked 3-5 INCH. If your posts are five to six inches wide, use the brackets marked 5-6 INCH.
2. Position the right rear bracket in the right rear of the device, as shown in the following figure. Whether you are using the 3-5 inch or the 5-6 inch bracket, the rear end of the bracket will be flush with the back of the device.
3. Attach the brackets to the right rack upright using two 10-32 x 5/8-in. panhead screws and two retainer nuts.
4. Repeat step 2 and step 3 to attach the left rear bracket to the left rack upright.
5. Tighten all the 10-32 x 5/8-in. screws to a torque of 25 in-lb (29 cm-kg).

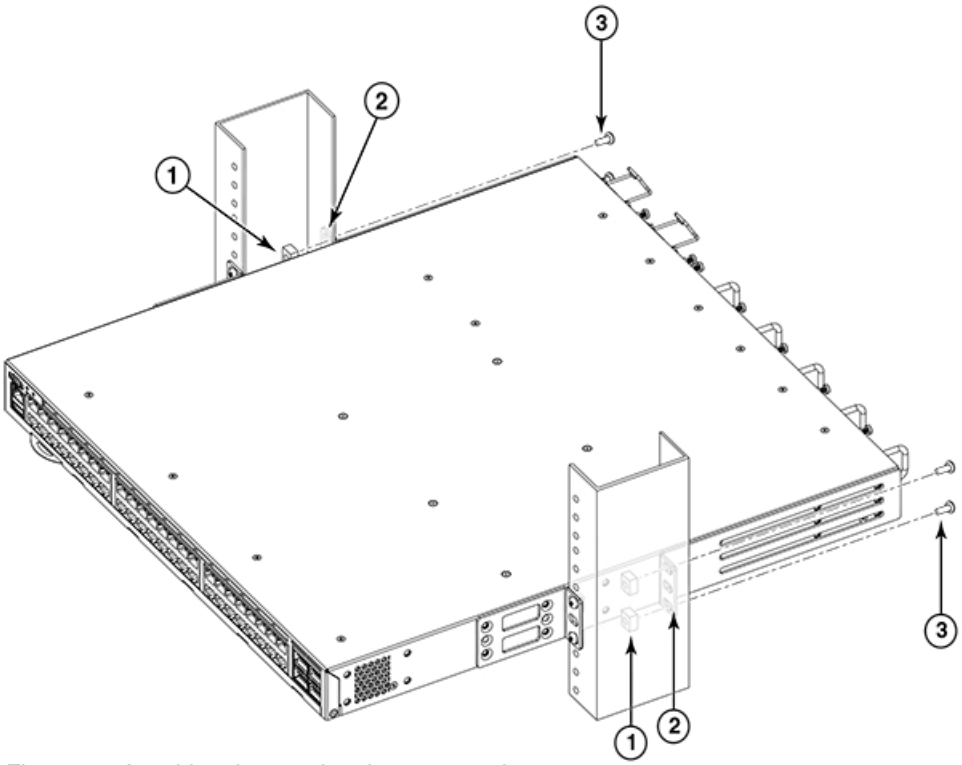



*Figure 22. Attaching the rear brackets to a rack*

1. Retainer nuts, 10-32
2. Rear brackets (right and left)
3. Screws, 10-32 x 5/8-in., panhead Phillips

## Attaching the rear brackets to the device

### About this task

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

### Procedure

1. Align the right rear bracket to the right rear of the device and use four 8-32 x 5/16-in. panhead screws to attach the bracket to the device, as shown in Figure 23 on page 36. Be sure to insert the screws through the upper and lower slots in the bracket.
2. Align the left rear bracket to the left rear of the device and use four 8-32 x 5/16-in. panhead screws to attach the bracket to the device. Again, use the upper and lower slots in the bracket.
3. Tighten all the 8-32 x 5/16-in. screws to a torque of 15 in-lb (17 cm-kg).

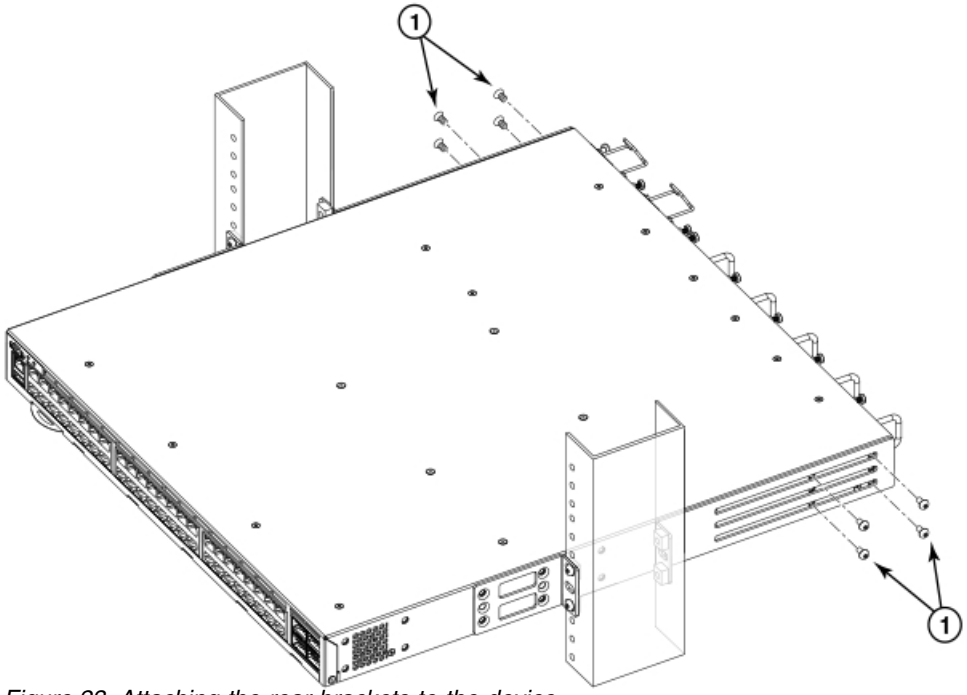



*Figure 23. Attaching the rear brackets to the device*

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

# Initial Setup and Verification

Once you have set up the SAN128B-6 in a rack or as a standalone switch, it is time to attach power and set up a basic configuration. If you are going to use the SAN128B-6 in a single-switch setup, you can use EZSwitchSetup to complete the basic configuration.

See the *EZSwitchSetup CD*, included with the switch, for more information. You can also use the *SAN128B-6 Quick Start Guide*. If you do not want to use EZSwitchSetup, follow the instructions in this section.

## Items required

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

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

## Providing power to the device

### About this task

Perform the following steps to provide power to the device.

### Procedure

1. Connect the power cords to both power supplies, and then to power sources on separate circuits to protect against power failure. Ensure that the power cords have a minimum service loop of 6 inches available and are routed to avoid stress.
2. Power on the power supplies by flipping both switches to the on position (the "I" symbol). The power supply LEDs display amber until power-on self-test (POST) is complete, and then change to green. The switch usually requires several minutes to boot and complete POST.

   **Note:** Power is supplied to the device as soon as the first power supply is connected and turned on.
3. After POST is complete, verify that the switch power and switch status LEDs are green. For more information about how to interpret POST, BOOT, and diagnostics tests, refer to “Monitoring the device” on page 51.

## Establishing a first-time serial connection

### About this task

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

### Procedure

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

   If the serial port on the workstation is RJ-45 instead of RS-232, remove the adapter on the end of the serial cable and insert the exposed RJ-45 connector into the RJ-45 serial port on the workstation.
2. Disable any serial communication programs running on the workstation such as synchronization programs.
3. Open a terminal emulator application such as PuTTY, XShell, or SecureCRT on a Windows PC, or TERM, TIP, or C-Kermit in a LINUX environment, and configure the application as follows:
   - In a Windows environment, use the following values:

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

     **Note:** Flow control is not supported on the serial connection when attached to a remote terminal and must be disabled on the customer-side remote terminal server in addition to the host-side clients.
   - In a UNIX environment using TIP, enter the following string at the prompt:

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

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

     ```
     tip /dev/ttya -9600
     ```
4. When the terminal emulator application stops reporting information, press **Enter** to display the login prompt.

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

   ```
   Fabric OS (swDir)
   swDir login: admin
   Password:
   Please change your passwords now.
   Use Control-C to exit or press 'Enter' key to proceed.
   swDir:admin>
   ```
6. Modify passwords. To skip modifying the password, press **Ctrl+C**.

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

## Configuring the IP address

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

## Using DHCP to set the IP address

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

## Setting a static IP address

### About this task

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

### Procedure

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

     ```
     Ethernet IP Address: [192.168.74.102]
     ```

   - If you are going to use an IPv6 address, enter the network information in colon-separated notation as prompted.

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

3. Complete the rest of the network information as prompted. (IPv4 format shown):

   ```
   Ethernet Subnetmask: [255.255.255.0]
   Ethernet IP Address: [192.168.74.102]
   Gateway IP Address: [192.168.74.1]
   ```

4. Enter `off` to disable DHCP when prompted.

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

---

## Setting the date and time

### About this task

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

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

Perform the following steps to set the date and time.

### Procedure

1. Log in to the device as admin.
2. Enter the **date**["*newdate*"] command at the command line.

   The *newdate* variable specifies the new date and time enclosed in double quotation marks. The operand is optional; if omitted, the current date and time is displayed. Date and time are specified as a string in the *mmddhhmmyy* format:
   - *mm*: Specifies the month. Valid values are 01 to 12.
   - *dd*: Specifies the date. Valid values are 01 to 31.
   - *hh*: Specifies the hour. Valid values are 00 to 23.
   - *mm*: Specifies the minutes. Valid values are 00 to 59.

- *yy*: Specifies the year, valid values are 00 to 37 and 70 to 99. Year values from 70 to 99 are interpreted as 1970 to 1999; year values from 00 to 37 are interpreted as 2000 to 2037.

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

# Setting the time zone

## About this task

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

## Procedure

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

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

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

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

*Table 9. tsTimeZone command parameter selection for the US time zones*

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

3. Reboot the device.

# Synchronizing local time with an external source

## About this task

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

## Procedure

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

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

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

# Customizing the chassis name and switch name

## About this task

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

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

## Procedure

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

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

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

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

# Establishing an Ethernet connection

## About this task

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

## Procedure

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

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

# Setting the domain ID

## About this task

Perform the following steps to set the switch domain ID.

## Procedure

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

   The default domain ID is 1. If the switch is not powered on until after it is connected to the fabric and the default domain ID is already in use, the domain ID for the new switch is automatically reset to a unique value. If the switch is connected to the fabric after it has been powered on and the default

domain ID is already in use, the fabric segments. To find the domain IDs that are currently in use, enter the **fabricShow** command on another switch in the fabric.

Perform the following steps to modify the domain ID.

a. Disable the switch by entering the **switchDisable** command.
b. Enter the **configure** command. The command prompts display sequentially; enter a new value or press **Enter** to accept each default value.
c. Enter **y** after the "Fabric param" prompt.

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

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

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

e. Complete the remaining prompts or press **Ctrl+D** to accept the remaining settings without completing all the prompts.
f. Re-enable the switch by entering the **switchEnable** command.

# Verifying correct operation

## About this task

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

## Procedure

1. Check the LEDs to verify that all components are functional.
2. Verify the correct operation of the device by entering the following commands from the workstation.

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

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

```
sb_70:admin> switchshow
switchName:     sb_70
switchType:     173.0
switchState:    Online
switchMode:     Native
switchRole:     Subordinate
switchDomain:   70
switchId:       fffc46
switchWwn:      10:00:00:05:1e:65:79:04
zoning:         ON (PERF_CFG)
switchBeacon:   OFF
FC Router:      OFF
Fabric Name:    abcfabric
Allow XISL Use: OFF
LS Attributes:  [FID: 128, Base Switch: No, Default Switch: Yes, Address Mode 0]

Index Port Address Media Speed       State   Proto
==================================================
   0   0   460000   id    N32      Online      FC  F-Port  20:05:00:11:0d:a8:01:00
   1   1   460100   id    N32      Online      FC  F-Port  20:01:00:11:0d:bb:01:00
   2   2   460200   id    N32      Online      FC  F-Port  20:03:00:11:0d:84:01:00
   3   3   460300   id    N32      Online      FC  F-Port  20:07:00:11:0d:26:01:00
```

```
  4   4   460400   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:5c:c5:01
  5   5   460500   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:58:4c:00
  6   6   460600   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:5c:c9:01
  7   7   460700   id    N32      Online      FC  F-Port  10:00:8c:7c:ff:5c:bd:00
  8   8   460800   --    N32      No_Module   FC
  9   9   460900   --    N32      No_Module   FC
 10  10   460a00   --    N32      No_Module   FC
 11  11   460b00   --    N32      No_Module   FC
 12  12   460c00   --    N32      No_Module   FC
 13  13   460d00   --    N32      No_Module   FC
 14  14   460e00   --    N32      No_Module   FC
 15  15   460f00   --    N32      No_Module   FC
 16  16   461000   --    N32      No_Module   FC
 17  17   461100   --    N32      No_Module   FC
 18  18   461200   --    N32      No_Module   FC
 19  19   461300   --    N32      No_Module   FC
 20  20   461400   --    N32      No_Module   FC
 21  21   461500   --    N32      No_Module   FC
 22  22   461600   --    N32      No_Module   FC
 23  23   461700   --    N32      No_Module   FC
<Output truncated>
```

# Backing up the configuration

## About this task

It is recommended that you back up the configuration on a regular basis to ensure that a complete configuration is available for downloading to a replacement switch.

## Procedure

1. Log in to the device as the admin user.
2. Back up the device configuration to an FTP server by entering the **configUpload** command and following the prompts.

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

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

   **Note:** If Virtual Fabrics (VF) is enabled, you must enter **configUpload** for each VF separately.

# Powering down the device

## About this task

Complete the following steps to power down the device.

## Procedure

1. Shut down the Fabric OS software using the **sysShutdown** command.
2. Identify the power-on switches in the nonport-side of the device.
3. Power off both power supplies by setting each power switch to the “O” position.
4. Unplug the power cables from the power source before servicing the device or FRUs.

## Results

All devices are returned to their initial state the next time the switch is powered on.

# Installing Transceivers and Cables

The SAN128B-6 only supports Brocade-branded 8 Gbps, 10 Gbps, and 16 Gbps SFP+ optical transceivers. For the Fibre Channel connections, the switch uses SFP+ transceivers that support any combination of Short Wavelength (SWL), Long Wavelength (LWL), and Extended Long Wavelength (ELWL) optical media. If the switch is shipped without SFP+ transceivers already installed, complete these steps to first install the transceivers and then to connect the cables.

## Time and items required

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

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

  **DANGER**

  **Use only optical transceivers that are qualified by IBM 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.**

- Required number of compatible fiber-optic cables
- Optical transceiver extraction tool

  **Note:** Many switches, backbones, and directors come with a transceiver extraction tool and holster. The extraction tool is designed to remove transceivers from modules where the space is limited. If you did not receive this tool with your product, you can order it from IBM.

*Figure 24. Optical transceiver extraction tool*

## Precautions specific to transceivers and cables


**DANGER**

**All fiber-optic interfaces use Class 1 lasers.**

**DANGER**

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

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

## Cleaning the fiber-optic connectors

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

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

## Managing cables

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

**Note:** You should not use tie wraps with optical cables because they are easily overtightened and can damage the optic fibers.
**CAUTION:**
**Before plugging a cable into any port, be sure to discharge the voltage stored on the cable by touching the electrical contacts to ground surface.**

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

## Installing an SFP+ transceiver

### About this task

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

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

### Procedure

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

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

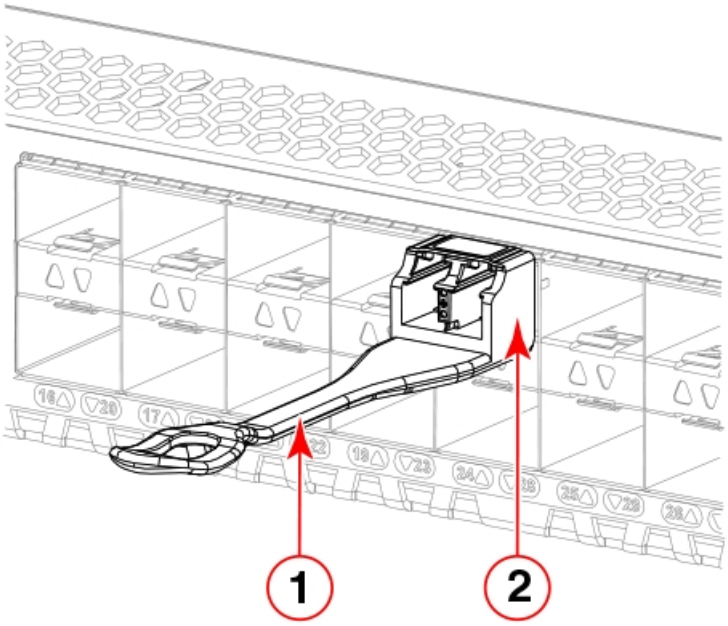



*Figure 25. Installing a 32-Gbps SFP+ transceiver into an upper port*

   1. Pull tab
   2. Transceiver

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

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

## Replacing an SFP+ transceiver

### About this task

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

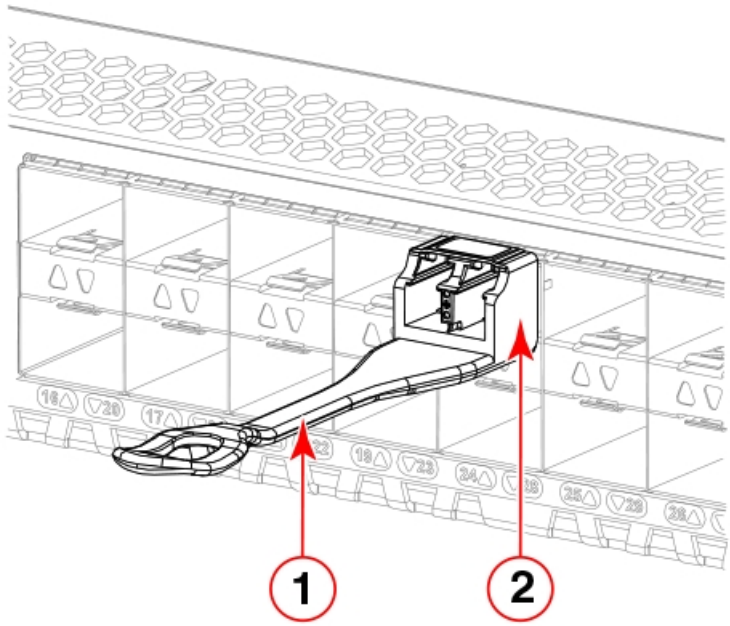
**Note:** 16- and 32-Gbps SFP+ transceivers have pull tabs instead of bails. Always use the pull tab to insert or remove the SFP+ transceivers, as the SFP might be hot.

### Procedure

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

   **Note:** Grasp the tab near the body of the transceiver to reduce the chances of bending the pull tab. As the SFP may be hot, avoid touching it.
3. To insert the replacement transceiver, use the pull tab on the SFP+ transceiver to carefully push the transceiver into the port. Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.

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




a. Pull tab
b. Transceiver

*Figure 26. Replacing a 32-Gbps SFP+ optical transceiver in an upper port*

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

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

## Installing a QSFP transceiver

### About this task

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

**Note:** QSFP transceivers have pull tabs rather then bails. Always use the pull tab to insert or remove the QSFP transceivers, as the QSFP might be hot.

### Procedure

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

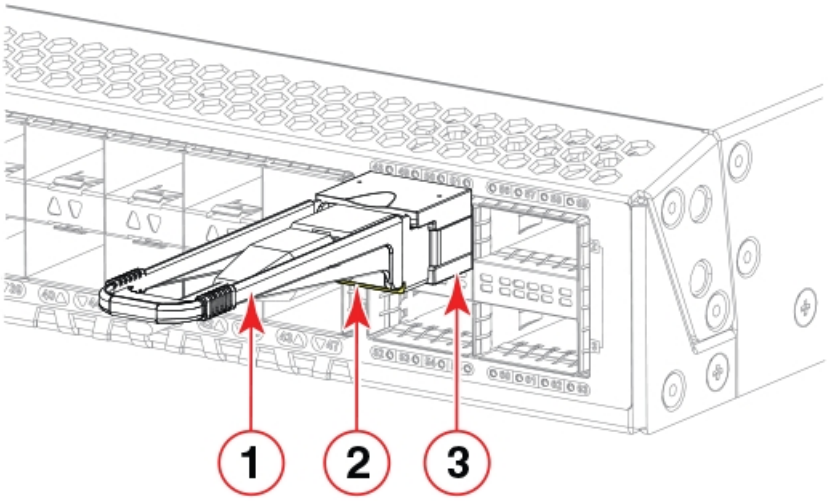



*Figure 27. Installing a 32-Gbps QSFP transceiver in an upper port*

1. Pull tab
2. QSFP cable
3. QSFP transceiver

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

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

## Replacing a QSFP transceiver

### About this task

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

**Note:** QSFP transceivers have pull tabs rather than bails. Always use the pull tab to insert or remove the QSFP transceivers, as the QSFP might be thermally hot.

### Procedure

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

   **Note:** Grasp the pull tab near the body of the transceiver to reduce the chances of bending the pull tab. As the QSFP may be hot, avoid touching it.

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

transceiver until the latching mechanism clicks.

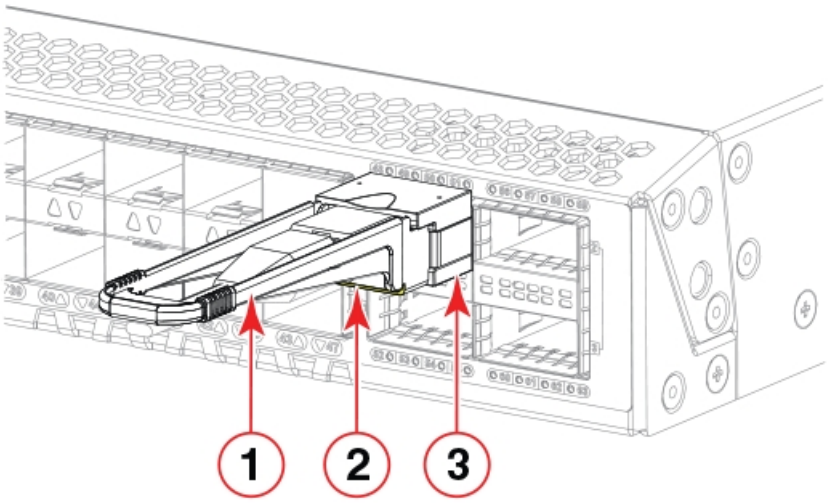



*Figure 28. Replacing a QSFP optical transceiver*

1. Pull tab
2. QSFP cable
3. QSFP transceiver

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

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

## Verifying the operation of new transceivers

### About this task

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

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

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

# Monitoring the device

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

## Port-side LED locations

The port-side of the switch has the following LEDs:

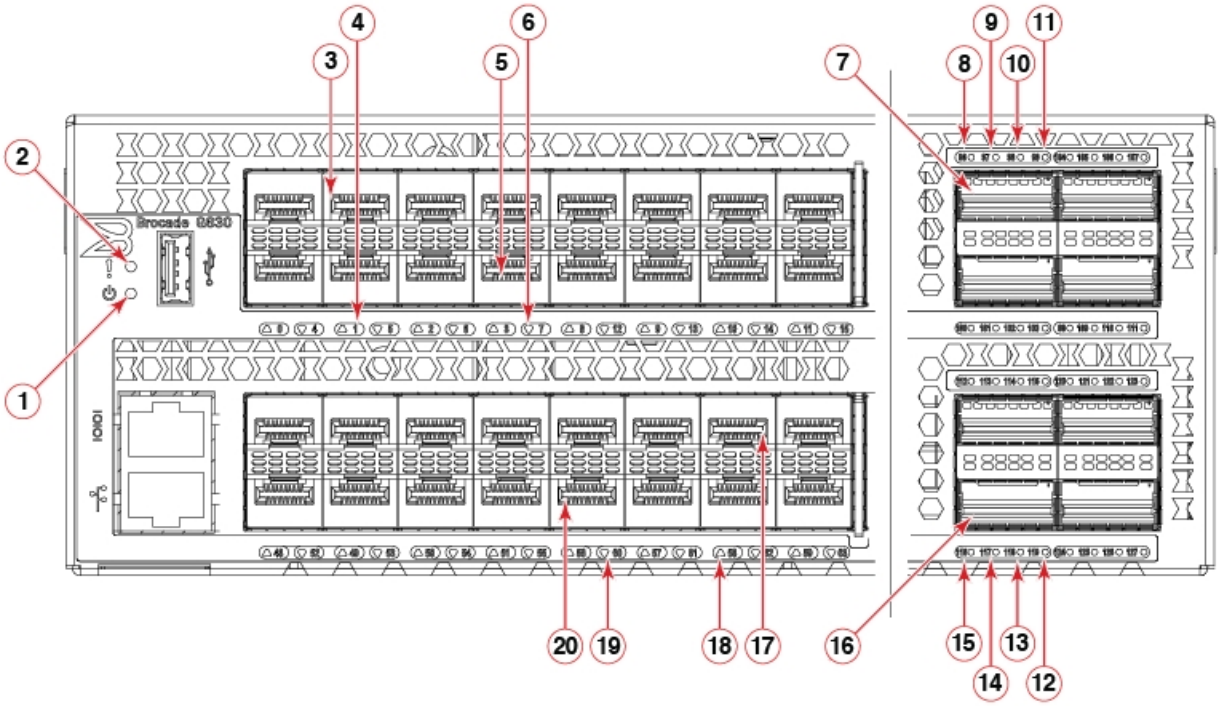



*Figure 29. SAN128B-6 port-side LEDs*

1. System status LED
2. System power LED
3. SFP+ (upper) port 1
4. SFP+ (upper) port 1 status LED
5. SFP+ (lower) port 7
6. SFP+ (lower) port 7 status LED
7. QSFP port 0
8. FC port 96 (QSFP 0) status LED
9. FC port 97 (QSFP 0) status LED
10. FC port 98 (QSFP 0) status LED
11. FC port 99 (QSFP 0) status LED
12. FC port 119 (QSFP 5) status LED

13. FC port 118 (QSFP 5) status LED
14. FC port 117 (QSFP 5) status LED
15. FC port 116 (QSFP 5) status LED
16. QSFP port 5
17. SFP+ (upper) port 58
18. SFP+ (upper) port 58 status LED
19. SFP+ (lower) port 60 status LED
20. SFP+ (lower) port 60

## System power LED

Refer to the following table to interpret the system power status LED.

*Table 10. System power LED patterns during normal operation*

| LED color | Status of hardware | Recommended action |
|---|---|---|
| No light | System is off or there is an internal power supply failure. | Verify that system is powered on, the power cables attached, and your power source is live.<br><br>If the system power LED is not green, the unit may be faulty.<br><br>Contact your solution provider. |
| Steady green | System is on and power supplies are functioning properly. | No action required. |

## System status LED

Refer to the following table to interpret the system status LED.

*Table 11. System status LED patterns during normal operation*

| LED color | Status of hardware | Recommended action |
|---|---|---|
| No light | System is off or there is no power. | Verify that system is on and has completed booting. |
| Steady green | POST and initialization is completed. System is on and functioning properly. | No action required. |
| Steady amber (for more than five seconds—can take over a minute to complete POST) | System is going through the power-up process. | No action required. |
| Steady amber (for more than a few minutes) | Unknown state, boot failed, or the system is faulty.<br>**Note:** Once POST completes and the switch has failed, steady amber may result. | Perform the following steps:<br>1. Connect a serial cable to the system.<br>2. Reboot the system.<br>3. Check the failure indicated on the system console<br>4. Contact your solution provider. |
| Flashing amber/green | 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 have been exceeded. | Check the management interface and the error log for details on the cause of the status.<br><br>Contact your solution provider. |

## FC port status LED

Refer to the following table to interpret the FC port status LEDs.

*Table 12. SFP+ FC port status LED patterns during normal operation*

| LED color | Status of hardware | Recommended action |
|---|---|---|
| No light | Indicates one of the following:<br>• No signal or light carrier (media or cable) detected.<br>• Device may be currently initializing.<br>• Connected device is configured in an offline state. | • Verify the power LED is on, and check the SFP+ and cable.<br>• Verify the device is not currently being initialized.<br>• Verify the status of the connected device. |
| Steady green | Port is online (connected to external device) but has no traffic. | No action required. |
| Slow-flashing green (on 1 second; then off 1 second) | Port is online but segmented because of a loopback cable or incompatible device connection. | Verify that the correct device is attached to the switch. |
| Fast-flashing green (on 1/4 second; then off 1/4 second) | Port is online and an internal loopback diagnostic test is running. | No action required. |
| Flickering green | Port is online and frames are flowing through the port. | No action required. |
| Steady amber | Port is receiving light or signal carrier, but it is not online yet. | No action required. |
| Slow-flashing amber (on 2 seconds; then off 2 seconds) | Port is disabled because of diagnostics or the **portDisable** command. | Reset the port.<br>The **portCfgPersistentDisable** command is persistent across reboots. |
| Fast-flashing amber (on 1/2 second; then off 1/2 second) | SFP+ or port is faulty. | Reset the port.<br>Replace the SFP+. Must be a Brocade-branded SFP+. |

## QSFP port status LED

Refer to the following table to interpret the QSFP port status LEDs

*Table 13. QSFP port status LED patterns during normal operation*

| LED color | Status of hardware | Recommended action |
|---|---|---|
| No light | Indicates one of the following:<br>• No signal or light carrier (media or cable) detected.<br>• Device may be currently initializing.<br>• Connected device is configured in an offline state. | • Verify the power LED is on, and check the QSFP and cable.<br>• Verify the device is not currently being initialized.<br>• Verify the status of the connected device. |
| Steady green | Port is online (connected to external device) but has no traffic. | No action required. |
| Slow-flashing green (on 1/2 second; then off 1/2 second) | Port is online but segmented because of a loopback cable or incompatible device connection. | Verify that the correct device is attached to the switch. |

*Table 13. QSFP port status LED patterns during normal operation (continued)*

| LED color | Status of hardware | Recommended action |
|---|---|---|
| Fast-flashing green (on 1/4 second; then off 1/4 second) | Port is online and an internal loopback diagnostic test is running. | No action required. |
| Flickering green | Port is online and frames are flowing through the port. | No action required. |
| Steady amber | Port is receiving light or signal carrier, but it is not online yet. | No action required. |
| Slow-flashing amber (on 2 seconds; then off 2 seconds) | Port is disabled because of diagnostics or the **portDisable** command. | Reset the port.<br>The **portCfgPersistentDisable** command is persistent across reboots. |
| Fast-flashing amber (on 1/2 second; then off 1/2 second) | QSFP or port is faulty. | Reset the port.<br>Replace the QSFP. Must be a Brocade-branded QSFP. |

**Note:** For the QSFP ports, if the port is configured as individual SFP+ FC ports on the other end using break-out cables, then the four individual port status LEDs for each QSFP should be monitored.

## Nonport-side LED locations

Each field-replaceable power supply and fan assembly unit contains a status LED.

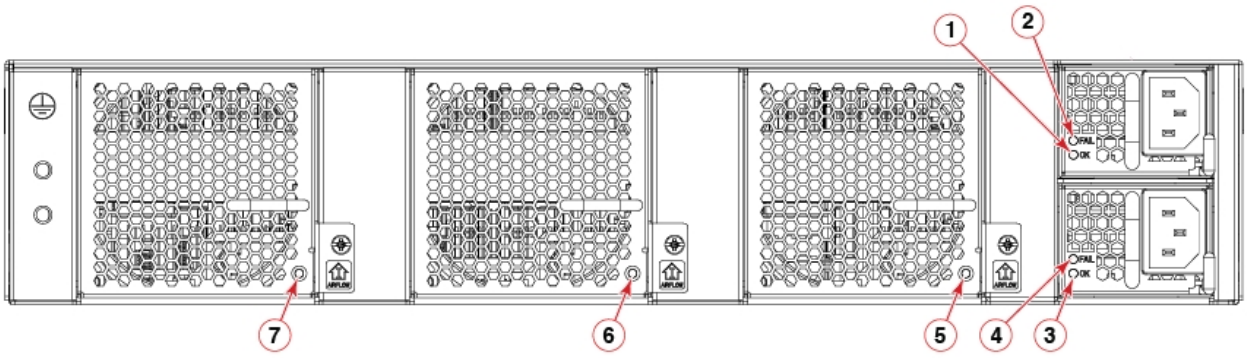



*Figure 30. Nonport-side LEDs with AC power supplies*

1. Power supply unit 1 OK LED
2. Power supply unit 1 FAIL LED
3. Power supply unit 2 OK LED
4. Power supply unit 2 FAIL LED
5. Fan assembly unit 3 status LED
6. Fan assembly unit 2 status LED
7. Fan assembly unit 1status LED

## Power supply OK and FAIL status LEDs

Refer to the following table to interpret the power supply status LEDs during normal operation.

*Table 14. Power supply status LEDs during normal operation*

| OK LED | FAIL LED | Description | Action required |
|---|---|---|---|
| Off | Off | No AC power to all the power supplies. | None. |
| Off | Blinking amber | Power supply continues to operate but experiencing either high temperature, high power, or slow fan. | Check and replace the power supply unit before it fails completely. |
| Off | Steady amber | Power supply unit failed due to over voltage, over current, over temperature or fan failure. | Check and replace the power supply unit. |
| Slow blinking green | Off | AC is applied to the power supply unit and standby voltage is available | None. |
| Steady green | Off | Power supply is on and running normally | None. |

## Fan assembly status LED

Refer to the following table to interpret the fan assembly status LED during normal operation

*Table 15. Fan assembly status LED patterns during normal operation*

| LED color | Description | Action required |
|---|---|---|
| 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:<br>• A fan assembly with mismatched airflow is present.<br>• One or more of the fans in the fan assembly has failed. | Try one of the following:<br>• Replace the mismatched fan assembly with one that has the correct airflow direction.<br>• Replace the faulty fan assembly. |

**Note:** The SAN128B-6 device requires minimum of two fan assemblies to be functional. Up to one fan assembly failure is supported.

## Interpreting the POST results

### About this task

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

The POST includes the following tasks:

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

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

### Procedure

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

## Interpreting the BOOT results

### About this task

BOOT includes the following tasks after POST is complete.

### Procedure

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

## Running diagnostic tests

### About this task

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

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

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

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

### What to do next

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

# Power Supply Assemblies

The power supply assembly units in the SAN128B-6 chassis can be removed and replaced without special tools. The device can continue operating during the replacement.

The device supports the following types of power supplies.

- AC power supply with nonport-side air exhaust. This unit moves the air from the port-side to the nonport-side of the device.
- AC power supply with nonport-side air intake. This unit moves the air from the nonport-side to the port-side of the device.

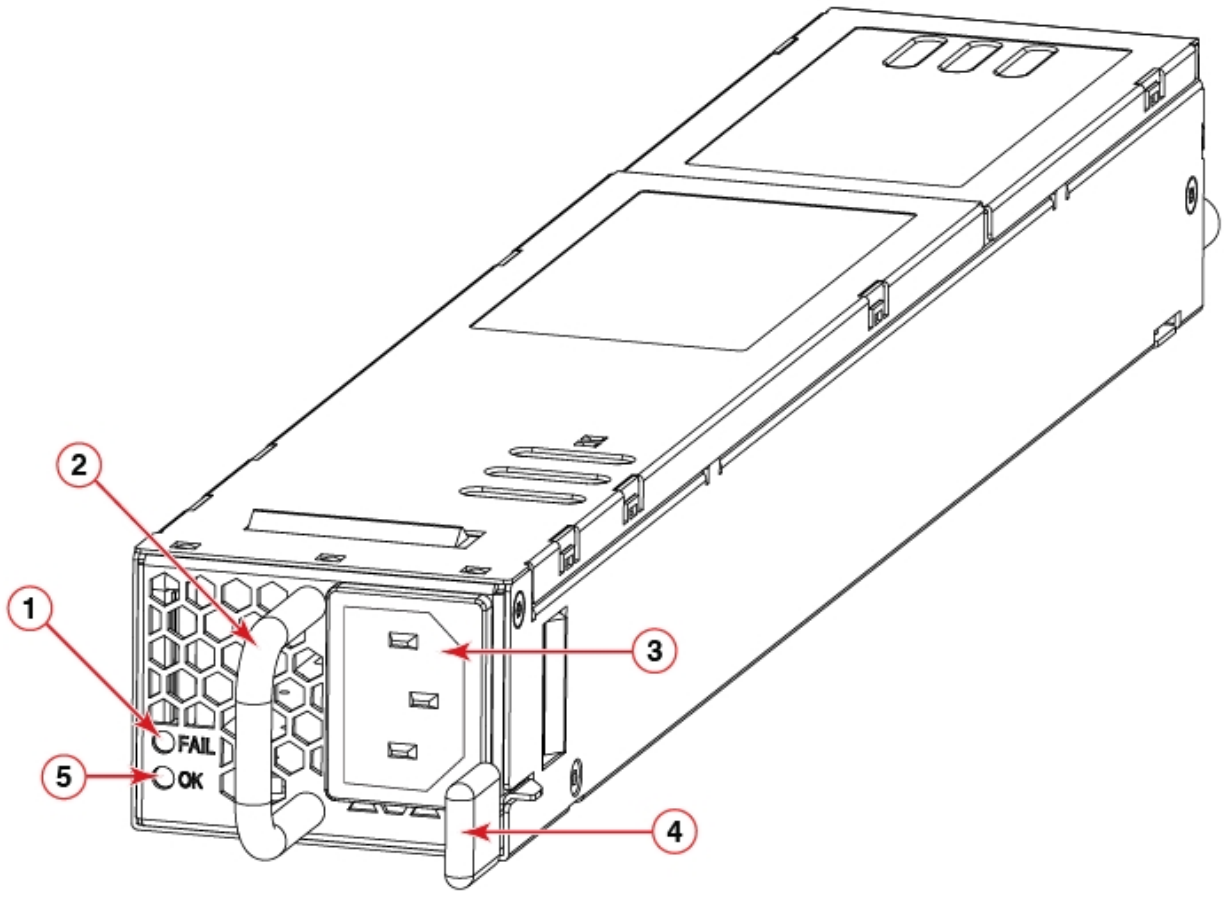



*Figure 31. AC power supply assembly*

1. Power supply unit FAIL LED
2. Power supply unit handle
3. AC power cable receptacle
4. Power supply assembly latch
5. Power supply unit OK LED

**Note:** The two power supply assemblies concurrently installed in the chassis must be of the same power type, model (airflow direction), and part number. If the airflow directions are different, an error is generated on the console.

**Note:** The power supply assembly units are hot-swappable if they are replaced one at a time. They are identical and fit into either slot.

**Note:** The device can operate all the ports with one power supply assembly unit if you do not require redundancy.

Each power supply unit has one internal fan.

## Precautions specific to the power supply assemblies

**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.**

**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:**
**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.**

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

**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.**

**Note:** The equipment installation must meet NEC/CEC code requirements. Consult local authorities for regulations.

**Note:** If the ambient temperature is above the recommended operational limits, the power supply units shutdown, which in turn shuts down the device without any warning message.

## Identifying the airflow direction

The power supply and fan assemblies are identified by the following airflow directions:

- **Intake power supply and fan assembly with an orange "I" label or without any label**: Pulls air from the nonport-side of the switch and exhausts it out the port side.

| | |
|---|---|
|  | • Nonport-side air intake<br>• Port-side air exhaust<br>• Back-to-front (nonport-side to port-side) airflow<br>• Part numbers ending with **-R** |

- **Exhaust power supply and fan assembly with a green "E" label**: Pulls air from the port side of the switch and exhausts it out the nonport-side.

| | |
|---|---|
|  | • Nonport-side air exhaust<br>• Port-side air intake<br>• Front-to-back (port-side to nonport-side) airflow<br>• Part numbers ending with **-F** |

## Power supply OK and FAIL status LEDs

Refer to the following table to interpret the power supply status LEDs during normal operation.

*Table 16. Power supply status LEDs during normal operation*

| OK LED | FAIL LED | Description | Action required |
|---|---|---|---|
| Off | Off | No AC power to all the power supplies. | None. |
| Off | Blinking amber | Power supply continues to operate but experiencing either high temperature, high power, or slow fan. | Check and replace the power supply unit before it fails completely. |
| Off | Steady amber | Power supply unit failed due to over voltage, over current, over temperature or fan failure. | Check and replace the power supply unit. |
| Slow blinking green | Off | AC is applied to the power supply unit and standby voltage is available | None. |
| Steady green | Off | Power supply is on and running normally | None. |

## Power supply assembly unit fault indicators

Use one of the following methods to determine the status of the power supply assemblies:

- Check the power supply OK and FAIL status LEDs.
- In Web Tools, click the Power Status icon.
- Enter the **psShow** command at the prompt to display power supply assembly status, as shown in the following example:

```
Device:admin> psshow
Power Supply #1 is OK
Power Supply #2 is OK
```

## Power supply assembly task guide

You can perform an easy set of steps to install or replace a power supply assembly or to replace both power supply assemblies. By default, both of the power supply assemblies are installed in the device.

### Installing an additional power supply and fan assembly (hot-install)

If your device is up and running with a single power supply assembly and you want to install an additional power supply, complete the following steps.

1. Insert the new power supply assembly.
2. Plug in the power cord on to the power supply assembly and the power source.
3. Turn on power source.
4. Verify the power supply assembly OK and FAIL status LEDs.

### Replacing a power supply and fan assembly (hot-swap)

If your device is up and running with two power supply assemblies, but one of them has failed, complete the following steps.

1. Power down source for the old or failed power supply assembly.
2. Remove the old or failed power supply assembly.
3. Insert the new power supply assembly.
4. Power on the source for the new power supply assembly.
5. Verify the power supply assembly OK and FAIL status LEDs.

### Replacing both power supply and fan assemblies (cold-swap)

If your device is up and running with both power supply assemblies, and you want to replace both of them, complete the following steps.

1. Shut down the system using the **sysShutdown** command.
2. Power down the both power supply assemblies.
3. Remove the old/failed power supply assemblies.
4. Insert the new power supply assemblies.
5. Power on the power supply assemblies.
6. Verify the power supply assemblies' OK and FAIL status LEDs.

## Time and items required

Installing or removing and replacing a power supply assembly should require less than five minutes to complete.

The following items are required to replace a power supply assembly:

- New power supply assembly (must have the same airflow direction as the power supply assembly being replaced)
- #1 Phillips-head screwdriver

## Recording power supply assembly critical information

### About this task

You can use the following commands to record the power supply assembly configuration and operations information:

- **chassisshow**
- **fanshow**
- **psshow**
- **historyshow**

- **tempshow**
- **sensorshow**

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

# Removing a power supply and fan assembly

## About this task

Complete the following steps to remove a faulty power supply and fan assembly.

**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.**

## Procedure

1. To leave the device in service while replacing a power supply and fan assembly, verify that the other power supply and fan assembly (the one not being replaced) has been powered on for at least four seconds and has a steady green LED.

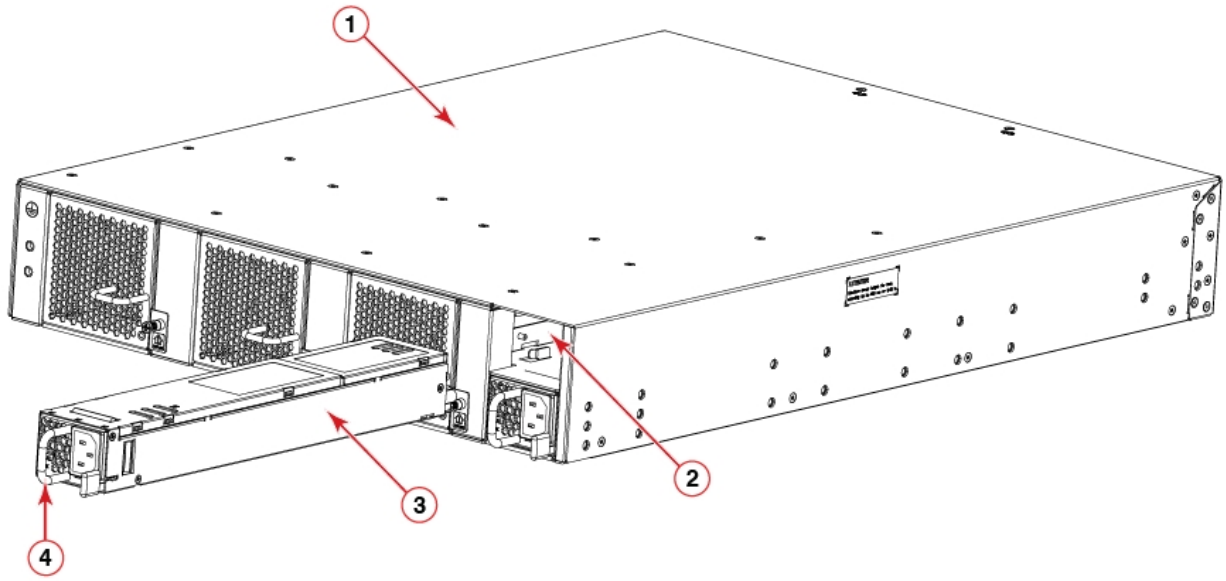



*Figure 32. Removing an AC power supply and fan assembly*

1. The SAN128B-6 device
2. Power supply slot 1
3. Power supply assembly unit
4. Power supply assembly handle
5. Captive screw

2. Unplug the power cord from the power supply that is being replaced.
3. Push the lever on the lower right corner of the power supply unit towards the IEC socket.
4. Remove the power supply assembly from the chassis by pulling the handle out and away from the chassis.

# Inserting a new power supply assembly

## Before you begin

The new power supply assembly must have the same part number and airflow label (or lack thereof) as the power supply assembly already installed.

## About this task

Complete the following steps to insert a new power supply assembly into the chassis.

**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.**

## Procedure

1. To leave the device in service while installing a power supply assembly, verify that the other power supply assembly (the one already installed) has been powered on for at least four seconds and has a steady green LED.
2. Orient the new power supply assembly unit and slide push in until the latch on the right side is secured. Pull on the handle to check and ensure that it is fully seated.

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

   **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.**

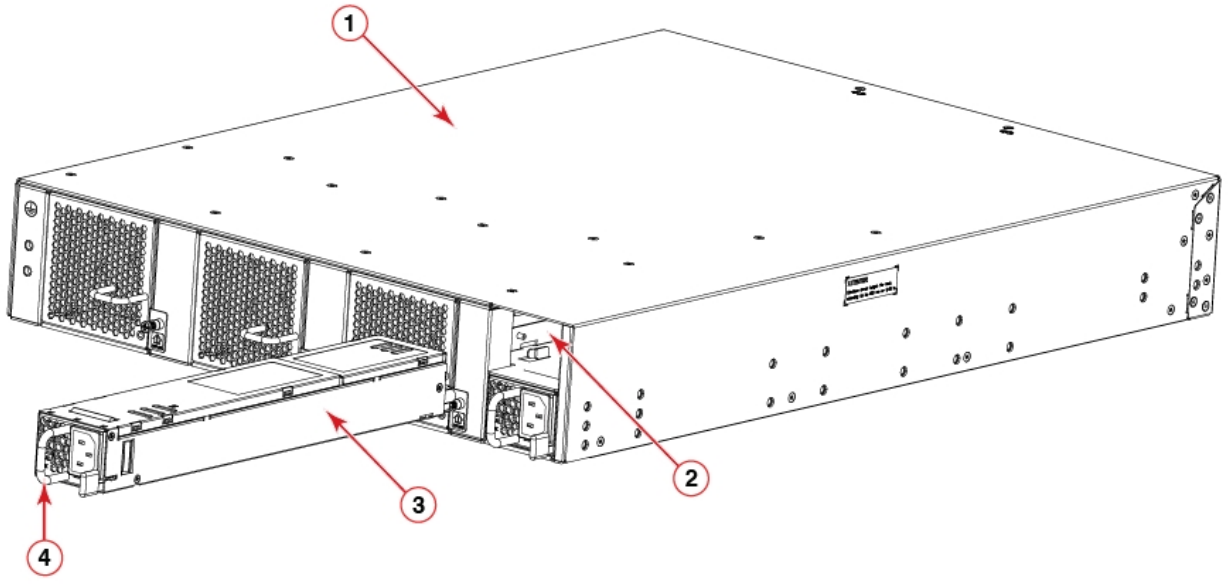



*Figure 33. Inserting an AC power supply and fan assembly*

1. The SAN128B-6 device
2. Power supply slot 1
3. Power supply assembly unit
4. Power supply assembly handle

3. Gently push the power supply assembly into the chassis until it is firmly seated.
4. Plug the power cord into the power supply assembly and power is provided to the device immediately.
5. Verify that the LED on the new power supply assembly displays a steady green light while the device is operating. If the LED is not a steady green, ensure that the power supply is securely installed and seated properly.
6. Optional: Enter **psshow** to display the PSU status. The power supply assembly status can also be viewed using Web Tools.

## Verifying the operation of the power supply and fan assemblies

### About this task

You can use the following commands to verify that the power supply and fan assemblies are operational:

- **psShow**
- **fanShow**
- **switchShow**
- **errDump**

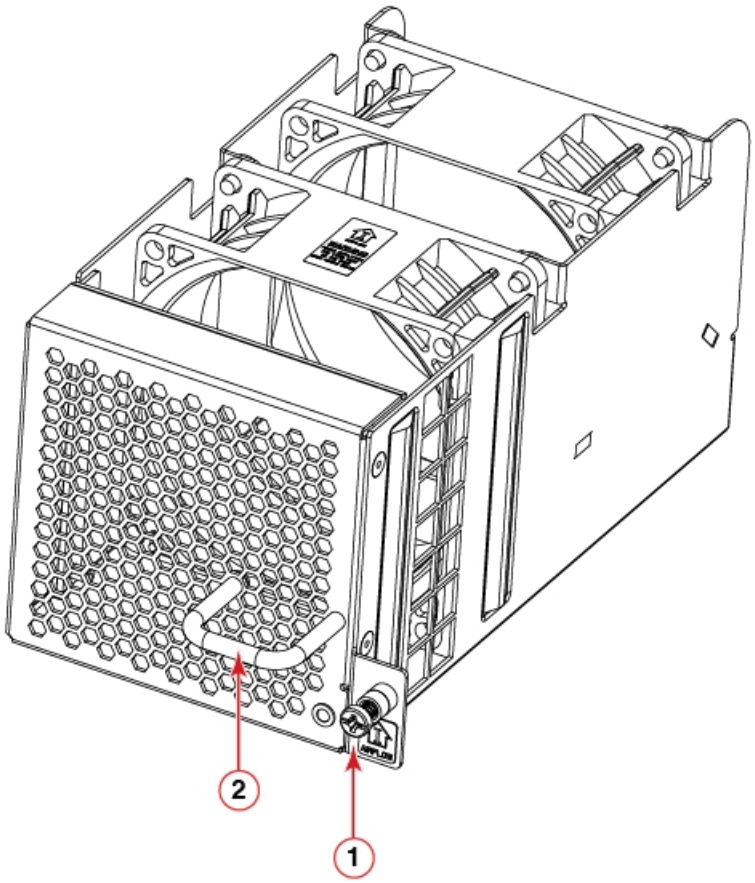
Refer to the *Fabric OS Command Reference* for output examples and descriptions.

# Fan Assemblies

The fan assembly units in the SAN128B-6 chassis can be removed and replaced without special tools. The device can continue operating during the replacement.

The device supports the following types of fan assemblies.

- Fan assembly with nonport-side air exhaust. This unit moves the air from the port-side to the nonport-side of the device.
- Fan assembly with nonport-side air intake. This unit moves the air from the nonport-side to the port-side of the device




1. Fan assembly unit handle
2. Captive screw

*Figure 34. Fan assembly*

**Note:** The three fan assemblies concurrently installed in the chassis must be of the same power type, model (airflow direction), and part number. If the airflow directions are different, an error is generated on the console.

**Note:** The fan assembly units are hot-swappable if they are replaced one at a time. They are identical and fit into any fan slot.

**Note:** The device can operate all the ports with two fan assemblies if you do not require redundancy.

The device fans are fixed inside the fan assemblies to provide necessary airflow to cool the whole system. There are two fans located in each unit. The system software sets fan speed and measures fan speed through the tachometer interface.

## Precautions specific to the fan assemblies

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

**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:**
**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.**


**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.**

**Note:** The equipment installation must meet NEC/CEC code requirements. Consult local authorities for regulations.

## Identifying the airflow direction

The power supply and fan assemblies are identified by the following airflow directions:

- **Intake power supply and fan assembly with an orange "I" label or without any label**: Pulls air from the nonport-side of the switch and exhausts it out the port side.

| | |
|---|---|
|  | • Nonport-side air intake<br>• Port-side air exhaust<br>• Back-to-front (nonport-side to port-side) airflow<br>• Part numbers ending with **-R** |

- **Exhaust power supply and fan assembly with a green "E" label**: Pulls air from the port side of the switch and exhausts it out the nonport-side.

| | |
|---|---|
|  | • Nonport-side air exhaust<br>• Port-side air intake<br>• Front-to-back (port-side to nonport-side) airflow<br>• Part numbers ending with **-F** |

## Fan assembly status LED

Refer to the following table to interpret the fan assembly status LED during normal operation

*Table 17. Fan assembly status LED patterns during normal operation*

| LED color | Description | Action required |
|---|---|---|
| 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:<br>• A fan assembly with mismatched airflow is present.<br>• One or more of the fans in the fan assembly has failed. | Try one of the following:<br>• Replace the mismatched fan assembly with one that has the correct airflow direction.<br>• Replace the faulty fan assembly. |

**Note:** The SAN128B-6 device requires minimum of two fan assemblies to be functional. Up to one fan assembly failure is supported.

## Fan assembly unit fault indicators

Use one of the following methods to determine the status of the fan assemblies:

- Check the fan assembly status LED.
- In Web Tools, click the Fan Status icon.
- Enter the **fanShow** command at the prompt to display fan assembly status, as shown in the following example:

```
Device:admin> fanshow
Fan #1 is OK
Fan #2 is OK
Fan #3 is FAILED
```

## Fan assembly task guide

You can perform an easy set of steps to install or replace a fan assembly or to replace two or all the three fan assemblies. By default, all the three fan assemblies are installed in the device.

### Installing an additional fan assembly (hot-install)

If your device is up and running with two fan assemblies and you want to install an additional fan assembly, complete the following steps.

1. Remove the existing filler panel.
2. Insert the new fan assembly.
3. Verify the fan assembly status LED.

### Replacing a fan assembly (hot-swap)

If your device is up and running with three fan assemblies, but one of them has failed, complete the following steps.

1. Remove the old or failed fan assembly.
2. Insert the new fan assembly.
3. Verify the fan assembly status LED.

### Replacing more than one fan assemblies (cold-swap)

If your device is up and running with all the three fan assemblies, but you want to replace more than one of them, complete the following steps.

1. Shut down the device using the **sysShutdown** command.
2. Remove the old/failed fan assemblies.
3. Insert the new fan assemblies.
4. Power on the device.
5. Verify the fan assembly status LEDs.

## Time and items required

Installing or removing and replacing a fan assembly should require less than five minutes to complete.

The following items are required to replace a fan assembly:

- New fan assembly (must have the same airflow direction as the fan assembly being replaced)
- #1 Phillips-head screwdriver

## Recording power supply and fan assembly critical information

### About this task

You can use the following commands to record the power supply and fan assembly configuration and operations information:

- **chassisshow**
- **fanshow**
- **psshow**
- **historyshow**
- **tempshow**
- **sensorshow**

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

## Removing a fan assembly

### About this task

Complete the following steps to remove a faulty fan assembly.

### Procedure

1. To leave the device in service while replacing a fan assembly, verify that the other power supplies and fan assemblies (the one not being replaced) have been powered on for at least four seconds and has a

steady green LED.

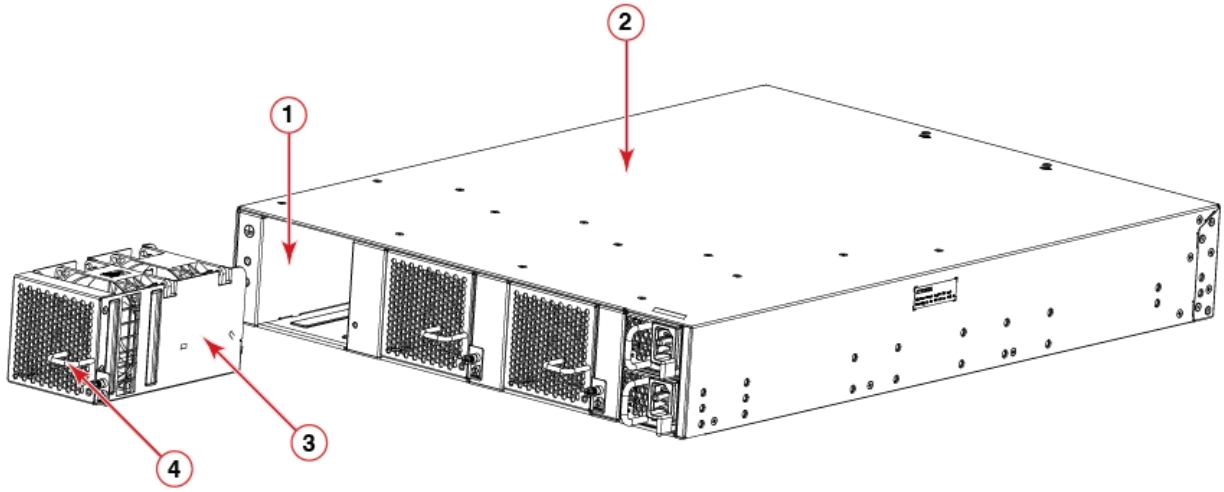



*Figure 35. Removing a fan assembly*

1. The SAN128B-6 device
2. Fan assembly slot 1
3. Fan assembly unit
4. Fan assembly handle

2. Using a Phillips screwdriver, unscrew the captive screw.
3. Remove the power supply and fan assembly from the chassis by pulling the handle out and away from the chassis. The fans in the other power supply will automatically switch to high speed to maintain adequate cooling.

## Inserting a new fan assembly

### Before you begin

The new fan assembly must have the same part number and airflow label (or lack thereof) as the fan assembly already installed.

### About this task

Complete the following steps to insert a new fan assembly into the chassis.

### Procedure

1. To leave the device in service while installing a fan assembly, verify that the other fan assemblies (the ones already installed) have been powered on for at least four seconds and has a steady green LED.
2. Using a Phillips screwdriver, unscrew the captive screw of the filler panel that is located in the empty fan assembly slot.
3. Orient the new fan assembly with the captive screw on the right, as shown in the figure.

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

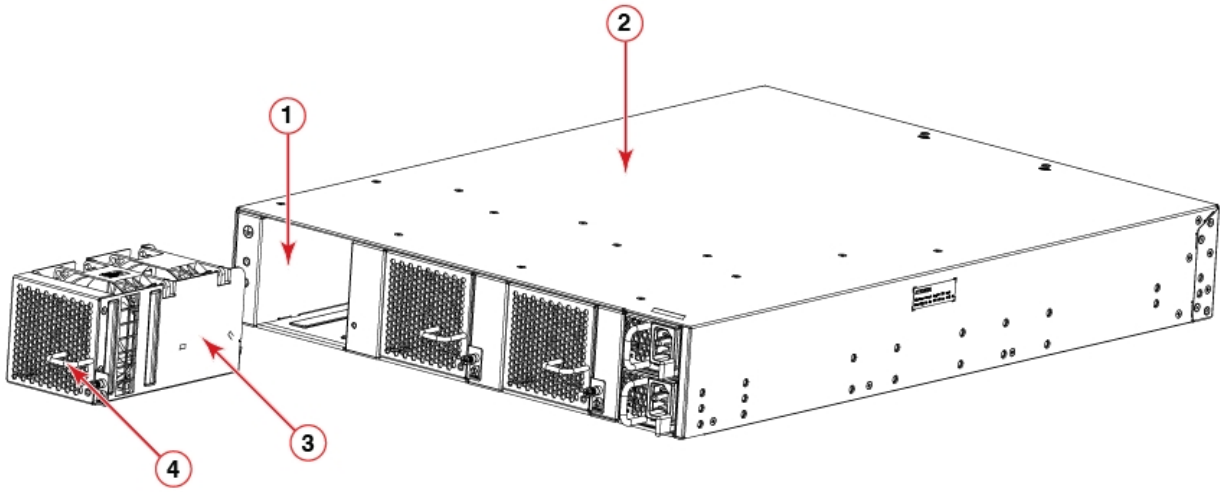



*Figure 36. Inserting a fan assembly*

1. The SAN128B-6 device
2. Fan assembly slot 1
3. Fan assembly unit
4. Fan assembly handle

4. Gently push the fan assembly into the chassis until it is firmly seated.
5. Using the Phillips screwdriver, secure the fan assembly to the chassis by tightening the captive screw.
6. Verify that the LED on the new fan assembly displays a steady green light while the device is operating.
7. Optional: Enter **fanshow** to display the fan assembly status. The fan assembly status can also be viewed using Web Tools.

## Verifying the operation of the power supply and fan assemblies

### About this task

You can use the following commands to verify that the power supply and fan assemblies are operational:

- **psShow**
- **fanShow**
- **switchShow**
- **errDump**

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

# Chassis replacement

The SAN128B-6 chassis is highly reliable and unlikely to fail. However, the chassis is available as a FRU and can be replaced using the following basic tasks. Since chassis replacement is a collaborative process between customers and SSRs please review the information provided in "Customer replacement responsibilities" and "IBM service replacement responsibilities" on page 79 to gain an understanding of your specific responsibilities for this procedure.

1. "Determining the need to replace the chassis"
2. "Chassis replacement overview"
3. "Preparing for replacement" on page 72
4. "Recording critical device and SAN information" on page 72
5. "Powering down the switch" on page 75
6. "Disconnecting the cables" on page 79
7. "Remove the old switch chassis and install the new switch chassis" on page 79
8. "Reconnecting system to the network and fabric" on page 75
9. "Downloading the configuration" on page 76
10. "Verifying correct operation of system" on page 77
11. "Verifying correct configuration of the fabric" on page 78

## Customer replacement responsibilities

Chassis replacement is a combined effort between the customer and the IBM System Services Representative (SSR). Before the IBM SSR can perform the physical replacement and labeling procedures, you must prepare your environment for chassis replacement by performing the following tasks:

- "Determining the need to replace the chassis"
- "Preparing for replacement" on page 72
- "Recording critical device and SAN information" on page 72
- "Powering down the switch" on page 75
- "Disconnecting the cables" on page 79
- "Reconnecting system to the network and fabric" on page 75
- "Downloading the configuration" on page 76
- "Verifying correct operation of system" on page 77
- "Verifying correct configuration of the fabric" on page 78

## Determining the need to replace the chassis

Before replacing the chassis, verify that the replacement is necessary. Ensure that the components are firmly seated when troubleshooting. Contact IBM support if you have any questions about whether the chassis should be replaced. Any of the following events might indicate that the chassis requires replacement:

- One or more components do not function properly.
- The **psShow** or **fanShow** commands continue to show a faulty component even though the component has been replaced.

## Chassis replacement overview

Use the following information to help prepare for a chassis replacement. Do not remove components without following procedures in this section exactly as you will need to save critical device and SAN

information for these components before disconnecting the chassis from the network, fabric, and power to begin removal procedures. After you reinstall components in the new chassis, follow exact procedures to reconnect to the network, fabric and power, and then download firmware if necessary and verify system operation and configuration.

Before beginning these procedures, perform the following tasks:

- Place the replacement chassis in close proximity to the old chassis.
- Provide a surface on which to place the old chassis, such as a second lift or the pallet originally provided with the chassis.
- Obtain all tools and other materials listed below.

**Attention:** Refer to "Safety notices and labels" on page xi and "ESD precautions" on page xvi before performing any removal or installation procedures.

## Time and items required

The chassis replacement procedure takes approximately 1 hour to complete, depending on number of SFPs and cables installed.

The following items are required for the chassis replacement procedure:

- Replacement chassis
- ESD grounding strap
- Phillips #2 screwdriver
- 1/4 in. straight slot screwdriver

## Preparing for replacement

Before beginning replacement procedures you must run a series of Fabric OS commands and record device information for safekeeping that may be required for installing and configuring the new chassis. This includes information on licenses, IP address, WWN, serial numbers, switch ID, location of configuration files, and fabric details. It also includes information that might be required by Technical Support. "Recording critical device and SAN information" instructs you to run the following commands and record specific output:

- supportShow
- configUpload
- configupload -vf
- ipAddrShow
- chassisShow
- nsShow
- nsAllShow
- switchShow
- fabricShow
- licenseShow

Before beginning replacement, you must also properly shut down the device and disconnect from the fabric and power using procedures under "Powering down the switch" on page 75.

## Recording critical device and SAN information

### About this task

Perform the following steps. All commands must be entered from a CLI session (telnet or serial) to the active CP blade unless otherwise indicated.

## Procedure

1. Run **supportShow**, which includes most of the information in the following table and more. Be sure to record the location of the .txt files that you create in this procedure that are not called out in the **supportShow** results. For detailed information about Fabric OS commands, refer to the *Fabric OS Command Reference*. Use a checklist to ensure that all required information is recorded.

*Table 18. Critical information checklist*

| Checked? | Data | Notes |
|---|---|---|
| Configuration information | | |
| | Location of "config-switch.txt" file | |
| | Location of "config-miscinfo.txt" file | |
| | IP address, subnet mask | |
| | WWN for the device | |
| SAN profile | | |
| | Location of "SANbefor.txt" file | |
| | Notes regarding **nsshow** output | |
| | Notes regarding **nsallshow** output | |
| | Notes regarding **switchshow** output | |
| | Notes regarding **fabricshow** output | |
| Output from **chassisshow** command<br>**Important:** The information displayed for Part Num and Serial Num are critical when replacing a chassis. This information allows the replacement chassis to assume the identity of the old chassis. | | |
| Output from **licenseshow** command | | |
| | License keys and other licensing data for licensed products enabled on device. | |
| Output from **supportshow** command | | |
| | Location of "spptshow.txt" file | |
| | Notes regarding **supportshow** output | |
| Information about the new chassis | | |
| | New factory serial number | |
| | New serial number (if available) | |
| | | |

2. Open a telnet session and log into the device as **admin**. The default password is *password*. Enable the logging function on your telnet or serial console connection.
3. Back up the current configuration by entering **configUpload**. Enter the requested information at the prompts.

   **Note:** If you are using the Virtual Fabric feature, run **configupload -vf** before running the **configupload** command to save the logical switch configuration.

   This **configUpload** command uploads the device configuration to the customer-defined FTP server, making it available for downloading. Alternatively, you can save the configuration file to a USB device. For more information about this command, refer to the *Fabric OS Command Reference*.

```
switch:admin> configupload
Protocol (scp, ftp, sftp, local)  [ftp]: ftp
Server Name or IP Address [host]: 123.123.123.123
User Name [user]: Admin24
```

```
Path/Filename [<home dir>/config.txt]: config-switch0.txt
Section (all|chassis|switch [all]): all
Password:
Upload complete
switch: admin>
```

4. Record the WWN value: Enter **wwn**, and then copy the command output into a file named config-miscinfo.txt.

```
switch:admin> wwn
10:00:00:60:69:00:00:0a
```

5. Enter **ipAddrShow**, and then copy the command output into the config-miscinfo.txt file.

```
switch:admin> ipaddrshow

SWITCH
Ethernet IP Address: 14.25.60.14
Ethernet Subnetmask: 255.55.0.0
Gateway IP Address: 14.25.43.1
DHCP: Off
```

6. Display and record the manufacturer serial numbers.

   Enter **chassisShow**, and then copy the command output into the config-miscinfo.txt file.

   "Factory Serial Num" and "Serial Num" are listed under "Chassis/WWN Unit 1" and "Chassis/WWN Unit 2". If the current WWN cards are the original cards, the factory serial number listed is the same as the chassis serial number.

```
CHASSIS/WWN  Unit: 1
Header Version:         2
Power Usage:            -288W
Factory Part Num:       40-1000864-11
Factory Serial Num:     CWA2551K00V
Manufacture:            Day:  1  Month: 11  Year: 2014
Update:                 Day: 29  Month:  6  Year: 2017
Time Alive:             774 days
Time Awake:             17 days
ID:                     IBM0000CA
Part Num:               0024980000R42
Serial Num:             10450TC
```

7. Create a SAN "profile" by entering and recording the information provided by the following commands:

   - **nsShow**
   - **nsAllShow**
   - **switchShow**
   - **fabricShow**

   Copy the command output into a text file named "SANbefor.txt." After the device is restored to the fabric, this information can be used to verify that no unintentional changes have occurred to the fabric.

```
switch:admin> nsshow
Enter Pid COS PortName NodeName TTL
<output truncated>
switch:admin> nsallshow
 12 Nx_Ports in the Fabric
<output truncated>
switch:admin> switchshow
switchName: switch
<output truncated>
switch:admin> fabricshow
Switch ID Worldwide Name Enet IP Addr FC IP Addr Name
<output truncated>
switch:admin>
```

8. Enter **licenseShow**, and then copy the command output into a text file named "licenseshow.txt."

```
switch:admin> licenseshow
S9bddb9SQbTAceeC:
Fabric license
eezeRRySff0fSe:
Remote Switch license
bzbzRcbcSc0c0SY:
Remote Fabric license
dSeR9RcSeeTfSAq:
Extended Fabric license
RyeSzRScycTzfT09:
Entry Fabric license
RyeSzRScycazfT0G:
Trunking license
RyeSzRScycS0fT09:
4 Domain Fabric license
```

9. Enter **supportShow**; then copy the command output into a text file named "spptshow.txt."

   **Note:** The **supportShow** command has a very long output and time for completion. It may last 20 minutes or longer depending on the size of the SAN.

   This file provides a backup of all the information that might be required by Technical Support. The information can be used after the device is restored to the fabric to verify that no unintentional changes have occurred to the fabric.

```
switch:admin> supportshow
version: 8.0.1
<output truncated>
switch:admin>
```

10. Record the cable connections between the chassis and the target device and ports.
11. Run **supportSave** on the active CP blade. The information recorded can be very important in case you have difficulties during the replacement process.

### Powering down the switch

If the switch is functioning at all, it must be disconnected from the network and fabric. To disconnect the switch from the network and fabric shut down the system by entering the **sysShutdown** command.

## Reconnecting system to the network and fabric

### About this task

Complete the following steps to reconnect the device to the network and fabric.

### Procedure

1. Connect the switch to the local area network.
   a. Insert the appropriate Ethernet cables into the Ethernet port.
   b. Connect the other ends to an appropriate Ethernet LAN, if not already connected.

      **Note:** The device can be accessed by remote connection using any of the available management tools, such as Telnet or Web Tools. Ensure that the device is not modified using other connections during the rest of this procedure.
2. Reconnect the transceivers and cables to the port.

   **Note:** The ports and cables used in trunking groups must meet specific requirements. For a list of these requirements, refer to the *Fabric OS Administrator's Guide*.

   a. Position one of the transceivers so that the key is oriented correctly to the port and insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.
   b. Select the cable that corresponds to the port and position it 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.

c. Repeat step a and step b for the remaining ports.
d. Organize the cables as required.

**Note:** Do not route cables in front of the air exhaust vents.

### What to do next

Allow the customer to "Downloading the configuration" and "Verifying correct operation of system" on page 77 and then proceed with "Reconnecting system to the network and fabric" on page 75.

## Downloading the configuration

### About this task

Once the chassis and its various components have been reassembled and powered back on, use the **configDownload** command to restore the original configuration. The **configDownload** command can be entered through a Telnet or serial session, but the device must have an Ethernet connection to the server name or IP address of the host for the download process to complete. For more information, refer to the **help configdownload** command or the *Fabric OS Command Reference*.

Complete the following steps to download the configuration.

### Procedure

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

```
switch:admin> login
login: admin
password: xxxxxxxx
switch:admin>
```

**Note:** If you are using the Virtual Fabric feature, you must run **configdownload -vf** *before* running the **configdownload** command to restore the logical switch configuration.

2. Enter the **chassisDisable** command.
3. Enter the **configDownload** command.

```
switch:admin> configdownload
Protocol (scp, ftp, sftp, local) [ftp]: ftp
Server Name or IP Address [host]: 123.123.123.123
User Name [user]: Admin24
Path/Filename [<home dir>/config.txt]: config-switch.txt
Section (all|chassis|switch [all]): all
```

**CAUTION:**
**This command is used to download a back-up configuration for a specific switch. If you use a file from a different switch, its configuration settings will override current switch settings.**
**Downloading a configuration file that was uploaded from a different type of switch, can cause this switch to fail.**

**Reboot the system for the configuration to take effect.**

```
configDownload operation may take several minutes to complete for large files.
Do you want to continue [y/n]: y
Password:
```

4. Reboot the device.
5. Enter the **chassisEnable** command to enable all user ports and enable a virtual fabric-aware chassis.

# Verifying correct operation of system

## About this task

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

## Procedure

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

```
switch:admin> login
login: admin
password: xxxxxxxx
switch:admin>
```

2. Enter the **chassisShow** command to verify that airflow direction set on WWN cards matches airflow direction for fans in fan and power supply assemblies installed in device. Airflow direction of fans and power supplies displays as "Fan Direction" under each fan or power supply unit. System airflow direction displays as "System Airflow" under the WWN card unit. The following example shows mismatch of system airflow and airflow direction in installed fan and power supply.

```
POWER SUPPLY  Unit: 1
Power Source:           AC
Fan Direction:          Non-portside Intake
...
FAN  Unit: 2
Fan Direction:          Non-portside Intake
...
WWN  Unit: 1
System AirFlow:         Non-portside Exhaust
...
WWN  Unit: 2
System AirFlow:         Non-portside Exhaust
```

   The WWN units should indicate "Non-portside Intake." If there is a mismatch of airflow direction, RAS log messages will indicate a mismatch between system airflow direction and airflow direction of fan in power supply or fan assembly refer to the Hardware Installation Guide for your product for more details.

3. Verify that the device is functioning correctly by entering **switchShow** or **switchStatusShow**.

   This **switchShow** command displays the device and port status information.

```
switch0:admin> switchshow
switchName:     sw0
switchType:     165.0
switchState:    Online
switchMode:     Native
switchRole:     Principal
switchDomain:   130
switchId:       fffc82
switchWwn:      10:00:00:05:31:03:2c:00
zoning:         ON (ZONE_CONFIG_NAME)
switchBeacon:   OFF
FC Router:      OFF
HIF Mode:       OFF
Allow XISL Use: OFF
LS Attributes:  [FID: 128, Base Switch: No, Default Switch: Yes,
Address Mode 0]
Index Slot Port Address Media  Speed  State    Proto
==================================================
  64    4    0   014000   --    N32   Online   FC  F-Port  10:00:00:05:1e:f8:a0:b4
  65    4    1   014100   --    N32   Online   FC  F-Port  10:00:00:05:33:26:0e:65
  66    4    2   014200   --    N32   Online   FC  F-Port  10:00:00:05:33:48:5e:f5
  67    4    3   014300   --    N32   Online   FC  F-Port  10:00:00:05:1e:f8:a0:b3
  68    4    4   014400   --    N32   Online   FC  F-Port  10:00:00:05:1e:f8:a0:b6
(output truncated)
```

4. Verify that all the IP address information is correct by entering **ipAddrShow** and checking the results against the IP information recorded in the config-miscinfo.txt file.

```
switch:admin> ipaddrshow

SWITCH
Ethernet IP Address: 14.25.60.14
Ethernet Subnetmask: 255.55.0.0
Gateway IP Address: 14.25.43.1
DHCP: Off
```

# Verifying correct configuration of the fabric

## About this task

Copying the command outputs from this section into a file is recommended. You must be logged in with Admin privileges.

## Procedure

1. Create an "after" SAN profile by entering the following commands and copying the output to a text file named SANafter.txt:
   - **nsShow**
   - **nsAllShow**
   - **switchShow**
   - **fabricShow**
   - **lscfg --show** (if using the Virtual Fabric feature)

```
switch:admin> nsshow
Type Pid    COS     PortName NodeName TTL(sec)
 N    020f00;      3;10:00:00:01:73:00:29:46;10:00:00:01:73:00:29:46; na
    Fabric Port Name: 20:0f:00:60:69:90:03:f0
<output truncated>
switch:admin> nsallshow
{
 020f00 021fda 021fdc 021fe0 021fe1
5 Nx_Ports in the Fabric}
switch:admin> switchshow
switchName: rsl8-st03-01
<output truncated>
switch:admin> fabricshow
Switch ID Worldwide Name Enet IP Addr FC IP Addr Name
<output truncated>
switch:admin>lscfg --show
Created switches: 128(ds) 1 2(bs)
Port  0   1   2   3   4    5     6     7     8     9
--------------------------------------------------------------------
FID  1 | 1 | 1 | 1 | 1 | 128 | 128 | 128 | 128 | 128 |
<output truncated>
switch:admin>
```

2. Determine any differences between the information in the SANafter.txt file and the information in the SANbefor.txt file created earlier. In particular, look for differences in the following:
   - Device types
   - Number of devices
   - ISL and port states
   - Number of switches in the fabric
3. Resolve any issues or unintentional changes to the device or fabric:
   - If there are any mechanical problems, try reseating the associated component.
   - If the configuration information is not correct for the device, modify as required.

- If other issues exist, contact your support provider.

## IBM service replacement responsibilities

IBM System Services Representatives (SSR) are responsible for the physical replacement and labeling of the chassis. The SSR performs the following tasks during the replacement:

1. "Disconnecting the cables"
2. "Remove the old switch chassis and install the new switch chassis"

## Disconnecting the cables

### Procedure

1. Power off the chassis by disconnecting both power cords from the power supplies and the power sources. Set the cords aside for use with the new installation.
2. After ensuring that the cables are properly labeled, and the port connection information is recorded (see Appendix B, "Cable routing table," on page 87), disconnect the cables and transceivers from the ports. Use the pull tab on the 16 Gbps SFP+ transceivers to remove the fiber cable and the attached SFP+ at the same time (see "Installing an SFP+ transceiver" on page 46).
3. Group the cables together and position them safely away from the switch to avoid damage during the chassis replacement process.

## Remove the old switch chassis and install the new switch chassis

### About this task

Follow these steps to remove the switch chassis from the cabinet. The rack mount hardware from the old chassis will be used for installing the new chassis in the cabinet. Depending on how the switch chassis was installed, you will need to complete the appropriate instructions in reverse to remove the chassis from the cabinet and the rack mounting kit hardware from the old chassis. Then complete the appropriate instructions from the beginning to attach the rack mounting kit hardware to the new chassis and install it into the cabinet. Refer to "Mounting the switch" on page 13 for more information.

### Procedure

Complete these steps after the new chassis is installed in the cabinet.

1. Reconnect all transceivers and fiber cables, using the information recorded in Table 19 on page 87 to ensure that connections are made to the correct ports.
2. Connect the two power cables to the power sources. The switch will begin to power up and start the POST as soon as the first power cable is connected.
3. Once POST has completed, the switch is ready to restore the saved configurations. Refer to the *Fabric OS Command Reference* for more information on the CLI commands.

### What to do next

Work with the customer to perform the steps for "Reconnecting system to the network and fabric" on page 75.

# Appendix A. Product specifications

This topic highlights the features and specifications for the SAN128B-6 switch.

## System specifications

| System component | Description |
|---|---|
| Enclosure | 2U, power from back<br>• Front-to-back airflow/nonport-side exhaust<br>• Back-to-front airflow/nonport-side intake |
| Power inlet | C14 |
| Power supplies | Dual, hot-swappable redundant power supplies with integral cooling fans |
| Fans | Three hot-swappable redundant fan assembly units with system cooling fans |
| Cooling | Port side to the nonport-side of the switch (nonport-side exhaust) and nonport-side to the port side (port-side exhaust) |
| System architecture | Nonblocking shared memory switch |
| System processors | Freescale T1042E CPU |
| Port-to-port latency | <900 nanoseconds (including FEC) with no contention (destination port is free) |

## Fibre Channel

| System component | Description |
|---|---|
| Fibre Channel ports | 96 SFP+ ports that support any combination of Short Wavelength (SWL) and Long Wavelength (LWL) or Extended Long Wavelength (ELWL) optical media.<br><br>8 QSFP ports that support 32-Gbps QSFP transceivers.<br><br>The SFP+ ports are capable of auto-negotiating to 4, 8, 16, or 32 Gbps speed depending on the SFP+ model and the minimum supported speed of the optical transceiver at the other end of the link.<br>• 10-Gbps performance is enabled by 10-Gbps SFP+ transceivers provided the other end of the connection is also of 10-Gbps speed.<br>• 4-, 8-, and 16-Gbps performance is enabled by 16-Gbps SFP+ transceivers provided the other end of the connection is minimum of 4 Gbps speed.<br>• 8-, 16-, and 32-Gbps performance is enabled by 32-Gbps SFP+ transceivers provided the other end of the connection is minimum of 8 Gbps speed.<br>**Note:** 2-, 4- and 8-Gbps transceivers are not supported. |
| ANSI Fibre Channel protocol | FC-PH (Fibre Channel Physical and Signaling Interface standard) with NVMe support |
| Modes of operation | Fibre Channel Class 2 and Class 3 |
| Fabric initialization | Complies with FC-SW-3 Rev. 6.6 |
| FCIP (IP over Fibre Channel) | Complies with FC-IP 2.3 of FCA profile |
| Port Status | Bicolor LED (amber/green) |

## Other

| System component | Description |
|---|---|
| Serial console port | One three-wire (Tx, Rx, Gnd) UART serial port |
| Ethernet management port | One 1000/100/10 Mbps Ethernet port |
| USB port | One external USB port |

## LEDs

| System component | Description |
|---|---|
| System power LED | One green system power status LED (lower) on the port side. |
| System status LED | One bicolor (green/amber) system status LED (upper) on the port side. |
| Ethernet port link LED | One link LED to the left of the RJ45 connector on the port side. Glows green for 1000 Mbps and amber for 100/10 Mbps. |
| Ethernet port activity LED | One activity LED to the right of the RJ45 connector on the port side. |
| Serial console port LED | The serial console port LEDs on the port side remain off at all times, even when a cable is inserted and the link is active. |
| FC port status LED | 128 bicolor (green/amber) port status LEDs. One for each SFP+ port and four for each QSFP port on the port side of the switch. |
| Power supply status LEDs | One green OK status LED on each power supply assembly on the nonport-side of the switch. |
| | One amber FAIL status LED on each power supply assembly on the nonport-side of the switch. |
| Fan assembly status LED | One bicolor fan assembly status LED on each fan assembly on the nonport-side of the switch. |

## Other

| System component | Description |
|---|---|
| Serial cable | RJ-45 console cable |
| RJ-45 to DB9 adapter | RJ-45 to DB9 for console cable |
| RJ-45 connector | Uses an RJ-45 connector for the serial port |

## Weight and physical dimensions

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

| Model | Height | Width | Depth | Weight (empty) | Weight (fully loaded) |
|---|---|---|---|---|---|
| SAN128B-6 switch | 8.67 cm<br>3.41 inches | 44.00 cm<br>17.32 inches | 60.96 cm<br>24.00 inches | 19.05 kg<br>42.00 lbs<br>(With 2 PSUs and 3 Fans) | 21.31 kg<br>47.00 lb<br>(With all the transceivers) |

## Environmental requirements

| Condition | Operational | Non-operational |
|---|---|---|
| Ambient temperature | 0°C to 40°C (32°F to 104°F) | -25°C to 70°C (-13°F to 158°F) |
| Relative humidity (non-condensing) | 10% to 85% at 40°C (104°F) | 10% to 90% non-condensing |
| Altitude (above sea level) | 0 to 3000 m (9,842 feet) | 0 to 12000 m (39,370 feet) |
| Shock | 20.0 G, 6 ms, half-sine wave | 33.0 G, 11 ms, half-sine wave, 3G Axis |
| Vibration | 0.5 G sine, 0.4 gms random, 5 – 500 Hz | 2.0 G sine, 1.1 gms random, 5 – 500 Hz |
| Airflow | Maximum: 387.37 cmh (228 cfm)<br>Nominal: 227.67 cmh (134 cfm) | N/A |
| Heat dissipation | Refer to the Power consumption table | N/A |
| Operating noise | Maximum: 74.2 dB with intake airflow<br>Maximum: 71.1 dB with exhaust airflow | 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-1500WPSAC-F | 1500 W | 100 – 240 VAC (nominal)<br>90 – 264 VAC (range) | 50/60 Hz (nominal)<br>47 – 63 Hz (range) | 12 A - 7A | Line fused | 40 A peak<br>**Note:** Do not repeat plug-in and plug-out operations within a short time, or else the internal inrush current limiting device (NTC) may not sufficiently cool down and may result in excessive inrush current. |
| XBR-1500WPSAC-R | 1500 W | 100 – 240 VAC (nominal)<br>90 – 264 VAC (range) | 50/60 Hz (nominal)<br>47 – 63 Hz (range) | 12 A - 7 A | Line fused | 40 A peak<br>**Note:** Do not repeat plug-in and plug-out operations within a short time, or else the internal inrush current limiting device (NTC) may not sufficiently cool down and may result in excessive inrush current. |

## Power consumption (typical configuration)

| Model name | @100 VAC input | @200 VAC input | Minimum number of power supplies | Notes |
|---|---|---|---|---|
| SAN128B-6 switch | 5.415 A<br>536 W<br>1829.41 BTU/hr | 2.682 A<br>522 W<br>1781.63 BTU/hr | 1 (Input current is for 1 PSU. Watts and BTUs/hr are with 2 PSUs). | 25% of ports loaded and operating at 32 Gbps traffic rate, fans at nominal speed, and input power +/- 5% tolerance. |

## Power consumption (maximum configuration)

| Model name | @100 VAC input | @200 VAC input | Minimum number of power supplies | Notes |
|---|---|---|---|---|
| SAN128B-6 switch | 9.5 A<br>958.59 VA<br>942 W<br>3215.12 BTU/hr | 4.55 A<br>913.13 VA<br>914 W<br>3119.56 BTU/hr | 1 (Input current and VA are for 1 PSU. Watts and BTUs/hr are with 2 PSUs). | Fully configured all ports with 100% traffic rate, fans at high speed, and input power +/- 5% tolerance. |

## Power consumption (idle configuration)

| Model name | @100 VAC input | @200 VAC input | Minimum number of power supplies | Notes |
|---|---|---|---|---|
| SAN128B-6 switch | 5.019 A<br>495 W<br>1689.47 BTU/hr | 2.491 A<br>484 W<br>1651.93 BTU/hr | 1 (Input current is for 1 PSU. Watts and BTUs/hr are with 2 PSUs). | No optics loaded and the system completed boot up, fans at nominal speed, and input power +/- 5% tolerance. |

## Data port specifications (Fibre Channel)

| Name | Port Numbers | Media Type | Description |
|---|---|---|---|
| SAN128B-6 switch | 0 to 95 | 10-, 16-, or 32-Gbps SFP+ optical ports | Can be an F_Port, E_Port, EX_Port, D_Port, or AE_Port |
| | 96 to 127 | 8 x 16-Gbps (64 Gbps) or 8 x 32-Gbps (128 Gbps) QSFP optical ports | Can be an F_Port, E_Port, EX_Port, D_Port, or AE_Port |

## Fibre Channel data transmission ranges

| Port speed (Gbps) | Cable size (microns) | Short wavelength (SWL) | Long wavelength (LWL) | Extended long wavelength (ELWL) |
|---|---|---|---|---|
| 4 | 50 | 150 m (492 ft) (OM2)<br>380 m (1,264 ft) (OM3)<br>400 m (1,312 ft) (OM4) | N/A | N/A |
| | 62.5 | 70 m (229 ft) | N/A | N/A |
| | 9 | N/A | 30 km (18.6 miles) | N/A |
| 8 | 50 | 50 m (164 ft) (OM2)<br>150 m (492 ft) (OM3)<br>190 m (623 ft) (OM4) | N/A | N/A |
| | 62.5 | 21 m (68 ft) | N/A | N/A |
| | 9 | N/A | 10 km (6.2 miles) | N/A |

| Port speed (Gbps) | Cable size (microns) | Short wavelength (SWL) | Long wavelength (LWL) | Extended long wavelength (ELWL) |
|---|---|---|---|---|
| 10 | 50 | 82 m (269 ft) (OM2)<br>300 m (984 ft) (OM3)<br>550 m (1,804 ft) (OM4) | N/A | N/A |
| | 62.5 | 33 m (108 ft) | N/A | N/A |
| | 9 | N/A | 10 km (6.2 miles) | N/A |
| 16 | 50 | 35 m (115 ft) (OM2)<br>100 m (328 ft) (OM3)<br>125 m (410 ft) (OM4) | N/A | N/A |
| | 62.5 | 15 m (49 ft) | N/A | N/A |
| | 9 | N/A | 10 km (6.2 miles) | 25 km (15.5 miles) |
| 32 | 50 | 70 m (230 ft) (OM3)<br>100 m (328 ft) (OM4) | N/A | N/A |
| | 62.5 | N/A | N/A | N/A |
| | 9 | N/A | 10 km (6.2 miles) | 25 km (15.5 miles) |

## Serial port specifications (pinout RJ-45)

| Pin | Signal | Description |
|---|---|---|
| 1 | Not supported | N/A |
| 2 | Not supported | N/A |
| 3 | TXD | Transmit data (output from SAN128B-6) |
| 4 | GND | Logic ground |
| 5 | GND | Logic ground |
| 6 | RXD | Receive data (input into SAN128B-6) |
| 7 | Not supported | N/A |
| 8 | Not supported | N/A |

**Note:** These specifications are for the serial connector on IBM 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 | DDR4 SDRAM with 8-bit ECC, SODIMM package, operating at 1600 MT/s | 8 GB, 64-bit |
| Boot Flash | Parallel NOR flash embedded memory | 8 MB + 16 MB |
| eUSB Module | - | 2 GB |

## Regulatory compliance (EMC)

- FCC Part 15, Subpart B (Class A)
- EN 55032/55024 (CE Mark) (Class A)
- ICES-003 (Canada)
- VCCI-32 (Japan)
- 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 CISPR 55032 (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).

# Appendix B. Cable routing table

If the information is not already available, have the customer use Table 19 to record cable routing information.

*Table 19. Cable routing table for SAN128B-6*

| Port | Cable labels | | Connected device | Slot/Port of the device |
|---|---|---|---|---|
| | Switch end | Device end | | |
| 0 | | | | |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |
| 30 | | | | |
| 31 | | | | |

*Table 19. Cable routing table for SAN128B-6 (continued)*

| Port | Cable labels | | Connected device | Slot/Port of the device |
|---|---|---|---|---|
| 32 | | | | |
| 33 | | | | |
| 34 | | | | |
| 35 | | | | |
| 36 | | | | |
| 37 | | | | |
| 38 | | | | |
| 39 | | | | |
| 40 | | | | |
| 41 | | | | |

# Notices

This information was developed for products and services offered in the USA.

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

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European community contact:

IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 (0) 800 225 5423 or +49 (0) 180 331 3233
Email: halloibm@de.ibm.com

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Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH
Technical Relations Europe, Abteilung M456
IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 800 225 5426
e-mail: halloibm@de.ibm.com

Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 / EN 55032 Klasse A.**

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中华人民共和国“A类”警告声明

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## Taiwan Contact Information

This topic contains the product service contact information for Taiwan.

IBM Taiwan Product Service Contact Information:
IBM Taiwan Corporation
3F, No 7, Song Ren Rd., Taipei Taiwan
Tel: 0800-016-888

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台灣國際商業機器股份有限公司
台北市松仁路7號3樓
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f2c00790

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This explains the Japan Voluntary Control Council for Interference (VCCI) statement.

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## Japan Electronics and Information Technology Industries Association Statement

This statement explains the Japan JIS C 61000-3-2 product wattage compliance.

（一社）電子情報技術産業協会　高調波電流抑制対策実施
要領に基づく定格入力電力値： Knowledge Centerの各製品の
仕様ページ参照

This statement explains the Japan Electronics and Information Technology Industries Association (JEITA) statement for products less than or equal to 20 A per phase.

高調波電流規格 JIS C 61000-3-2 適合品

This statement explains the JEITA statement for products greater than 20 A, single phase.

高調波電流規格 JIS C 61000-3-2 準用品

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- 回路分類：6（単相、ＰＦＣ回路付）
- 換算係数：0

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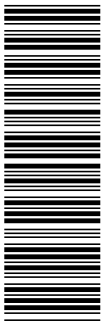

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