BROCADE

HARDWARE INSTALLATION GUIDE

Brocade DCX Backbone Hardware Installation Guide

53-1000685-24
28 February 2017

Contents

Preface

Document conventions

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

Notes, cautions, and warnings

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

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

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

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

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

Text formatting conventions

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

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

Format	Description
	Identifies command syntax examples.

Command syntax conventions

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

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

Brocade resources

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

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

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

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

Document feedback

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

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

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

Contacting Brocade Technical Support

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

Brocade customers

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

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

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

Brocade OEM customers

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

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

About This Document

Supported hardware and software

This document includes information specific to the Brocade DCX running Brocade Fabric OS version 7.4.0. and later.

Initial support for this device was at Fabric OS version 6.2.0.

What's new in this document

The following changes have been made in this document:

- Modified the copyright statement.
- Added note about RTC/NVRAM batteries in Hardware components on page 15.
- Editorial changes to sections in GUID-25F4B3AC-7D35-4DBB-A847-68D335839B41.ditamap.
- Added notes to following sections directing users replacing a defective chassis to not replace WWN cards shipped preinstalled in replacement chassis with existing WWN cards as this will cause licensing and RMA problems. Note also describes license transfer process.
  - Removing components from the chassis on page 130
  - Installing components into the new chassis on page 131
- Editorial changes in rack mount kit procedures.

Overview

Brocade DCX features

The Brocade DCX represents the next generation of advanced Fibre Channel enterprise-class platforms used to intelligently interconnect storage devices, hosts, and servers in a Storage Area Network (SAN). The Brocade DCX is the highest-performance and highest-scalability enterprise-class platform offered by Brocade. It satisfies the most demanding Reliability, Availability, and Serviceability (RAS), performance, and scalability requirements, while delivering investment protection, interoperability, and fabric-based intelligence advantages found only in the Brocade product family.

Key features of the Brocade DCX include:

- Up to 512 external ports in a single chassis, enabling high density SAN configurations with reduced footprint.
- Support for 1-, 2-, 4-, and 8-Gbps auto-sensing Fibre Channel (FC) ports. Trunking technology groups up to eight ports to create high performance 64-Gbps ISL trunks between switches. (10-Gbps ports (FC10-6) are 10 Gbps only.)
- Up to 1024 ports in the same rack can connect with the use of inter-chassis links (ICLs). Up 1536 ports can be connected via ICLs in adjacent racks.
- Support for high-performance port blades running at 1, 2, 4, 8, or 10 Gbps, enabling flexible system configuration.
- Redundant and hot-swappable CP8 and CR8 blades, power supplies, blower assemblies, and WWN cards that enable a high availability platform and enable nondisruptive software upgrades for mission-critical SAN applications.
- Universal ports that self-configure as E_Ports, F_Ports, FL_Ports, Ex_Ports and M_Ports (mirror ports). (10-Gbps ports (FC10-6) are E_Ports only.)
- Data cryptographic (encryption/decryption) and data compression capabilities through the Brocade FS8-18 Encryption Blade.
- Fibre Channel over IP (FCIP) functionality through the FX8-24 blade.
- Fibre Channel over Ethernet (FCoE) capability through the FCOE10-24 blade.

Hardware components

The Brocade DCX features a modular and scalable mechanical construction that allows a wide range of flexibility in installation, fabric design, and maintenance. The chassis can be mounted with the cables facing the front of the equipment rack or to the rear, and consists of the following:

- Up to eight hot-swappable port blade assemblies that can be configured in a single chassis, delivering up to 512 Fibre Channel ports.

- Two slots for control processor blades (CP8):
  - A single active CP8 blade can control all 512 ports in the chassis.
  - The standby CP8 blade assumes control of the Brocade DCX if the active CP fails.

    NOTE
    Device control processors and management modules contain batteries for RTC/NVRAM backup. Do not attempt to replace these batteries. Dispose of hardware components containing these batteries as required by local ordinances and regulations.

- Two slots for core switch blades (CR8):
  - CR8 blade interconnects all port blades.
  - Two inter-chassis link (ICL) connectors per blade to connect to another chassis.
  - Both CR8 blades are active.
- Modular hot-swappable port blades:
  - 16-port, 8-Gbps blades (FC8-16)
  - 32-port, 8-Gbps blades (FC8-32)
  - 48-port, 8-Gbps blades (FC8-48)
  - 64-port, 8-Gbps blades (FC8-64)
- Modular hot-swappable application blades:
  - FX8-24: 24-port (12 FC, 10 GbE, 2 10GbE) FCIP extension blade enabling long distance communication over existing IP infrastructure.
  - FCOE10-24: 24-port (24 10GbE) CEE-based FCoE blade enabling enhanced connectivity using existing Ethernet infrastructure. This blade cannot be used in the same chassis as the high density port blade FC8-64 or any of the other application blades (FX8-24 or FS8-18).
- Modular hot-swappable encryption blades:
  - FS8-18: 16-port, up to 4 blades per chassis, supporting data cryptographic (encryption/decryption) and data-compression capabilities.
- Modular hot-swappable field-replaceable units (FRUs):
  - Three blower assemblies.
  - Up to four power supplies (100-240 VAC auto-sensing).
    - At 240 VAC: A minimum of two power supplies is required, regardless of the number of port or application blades. 240 VAC is recommended for efficiency and high availability.
    - At 120 VAC: Four power supplies are required when using the FS8-18, FX8-24, or FCOE10-24 blades.
    - Redundant AC primary power connections to ensure high availability. Each power supply has its own connector, so the number of primary power connections varies from two (recommended minimum) to four (optimum efficiency and redundancy).
  - Two WWN cards.
  - Small Form-factor Pluggable (SFP, SFP+, and mSFP) optical transceivers. SFP transceivers support speeds of 1, 2, and 4 Gbps. SFP+ and mSFP transceivers support speeds of 2, 4, and 8 Gbps.
  - Extended Form-factor Pluggable (XFP) optical transceivers (10 Gbps).

  NOTE
  The 8-Gbps SFPs and mSFPs auto-negotiate at 2, 4, and 8 Gbps. The 4-Gbps SFPs auto-negotiate at 1, 2, and 4 Gbps.

- Blades that are serviced from the port side of the Brocade DCX. Blowers, power supplies, and power cables that are serviced from the nonport side.

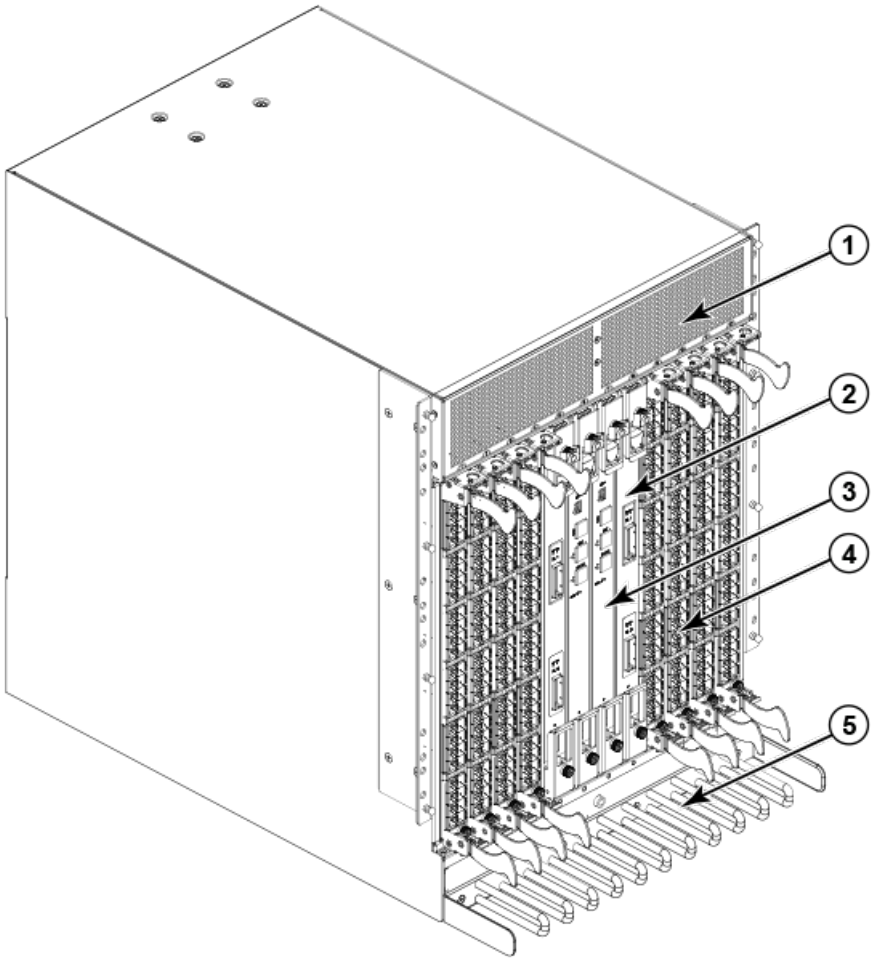
- World Wide Name (WWN) cards on the nonport side, to maintain chassis-specific information such as WWNs, IP addresses, and summary status information of each port blade and power supply through LEDs.
- Redesigned cable management comb and chassis door.
- Constant intake and FRU temperature monitoring.

Port side of the Brocade DCX

NOTE
Airflow in the Brocade DCX is from the nonport (noncable) side to the port (cable) side and out the exhaust vent.

The following illustration displays a sample configuration of the port side of the Brocade DCX.

FIGURE 1 Port side of the Brocade DCX (sample configuration)



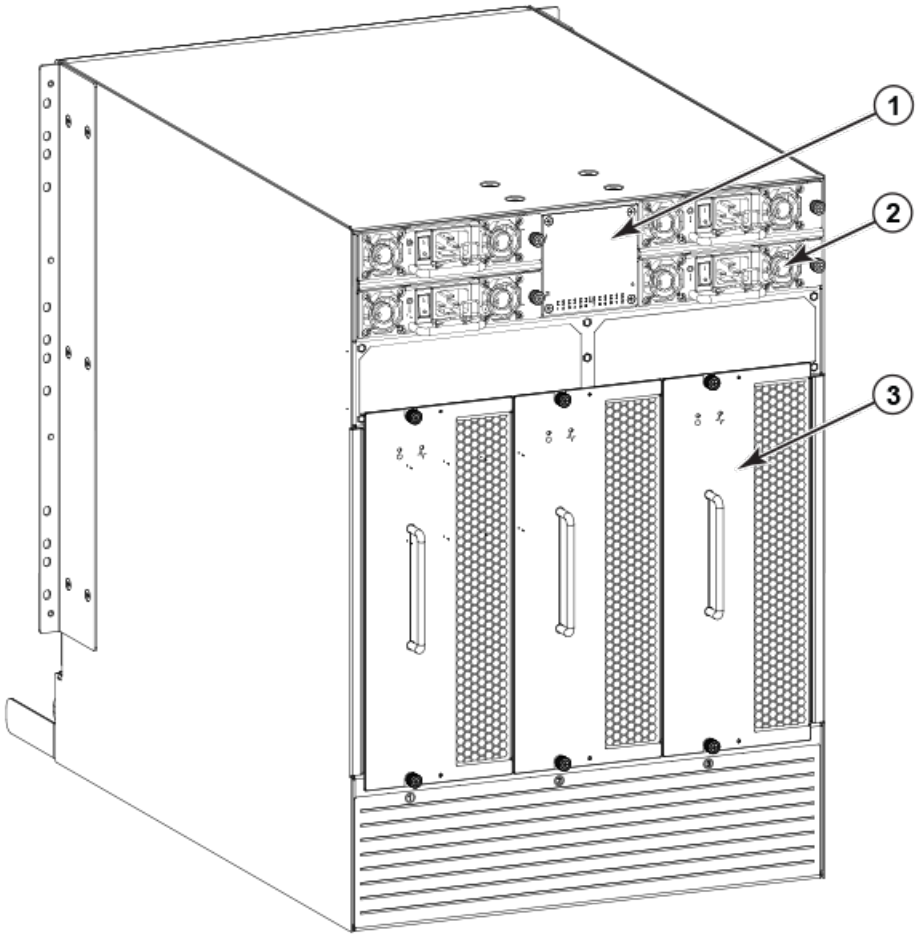
1. Exhaust Vent
2. Core switch blade (CR8)
3. Control processor blade (CP8)

4. FC8-48 port blade
5. Cable management comb

Nonport side of the Brocade DCX

The following illustration displays a sample configuration of the nonport side of the Brocade DCX.

FIGURE 2 Nonport side of the Brocade DCX (sample configuration)



1. WWN bezel (logo plate)
2. Power supply (4x)
3. Blower assembly (3x)

Brocade DCX blades

The following table summarizes the port, application, control processor, and core switch blades that are supported on the Brocade DCX.

TABLE 1 Blades supported on Brocade DCX

Description	Name	Function
Brocade DCX control processor blade	CP8	The CP8 blade contains the control plane for the chassis. There are two CP8 blades for redundancy. This control processor blade is compatible with the Brocade DCX and Brocade DCX-4S.
Brocade DCX core switch blade	CR8	The CR8 blade contains the ASICs for switching between port blades. Every port blade connects to each core switch blade. There can be up to 512 total ports for port blades. Each core switch blade connects to 128 backplane ports. Core switch blades have additional front port connectivity to connect multiple chassis and backplane connections for the storage server blade. This core switch blade is compatible only with the Brocade DCX.
16-port 8-Gbps port blade	FC8-16	A 16-port Brocade port blade supporting 1, 2, 4, and 8 Gbps port speeds. This port blade is compatible with the Brocade 48000 Director, Brocade DCX, and Brocade DCX-4S.
32-port 8-Gbps port blade	FC8-32	A 32-port Brocade port blade supporting 1, 2, 4, and 8 Gbps port speeds. This port blade is compatible with the Brocade 48000 Director, Brocade DCX, and Brocade DCX-4S.
48-port 8-Gbps port blade	FC8-48	A 48-port Brocade port blade supporting 1, 2, 4, and 8 Gbps port speeds. This port blade is compatible with the Brocade 48000 Director, Brocade DCX, and Brocade DCX-4S.
64-port 8-Gbps port blade	FC8-64	A 64-port Brocade port blade supporting 2, 4, and 8 Gbps port speeds. This port blade is compatible with the Brocade DCX and Brocade DCX-4S. This blade cannot be used in the same chassis with an FCOE10-24 blade.
Storage encryption blade	FS8-18	The FS8-18 blade enables data cryptographic (encryption/decryption) and data-compression capabilities. It has 16 Fibre Channel optical SFP ports. This application blade is compatible with the Brocade 48000 Director, Brocade DCX, and Brocade DCX-4S.
FCIP extension blade	FX8-24	The FX8-24 blade enables FCIP functionality over existing IP infrastructure. It has 12 FC ports, 10 GbE ports, and 2 10GbE ports available. This application blade is compatible with the Brocade DCX and Brocade DCX-4S.
Fibre Channel over Ethernet blade	FCOE10-24	The FCOE10-24 blade enables FCoE functionality over existing Ethernet infrastructure utilizing CEE protocols. It has 24 10GbE ports available. This application blade is compatible with the Brocade DCX and Brocade DCX-4S.This blade cannot be used in the same chassis with an FC8-64 high density port blade or any of the other application blades (FX8-24 or FS8-18).

Chassis slots

Chassis slots are numbered 1 through 12, from left to right when facing the port side of the Brocade DCX. Control processor blades (CP8) can be installed only in slots 6 and 7. Core switch blades (CR8) can be installed only in slots 5 and 8. The rest of the slots ,1-4 and 9-12, can be filled with port, application, or encryption blades. Unused slots must be filled with blade filler panels to maintain adequate cooling.

Port numbering

The Brocade DCX uses the following port numbering method (Port Numbering Template on page 149).

Port or application blade	Port numbering	Trunking port group numbering
FC8-16 port blade	• 0 through 15 from bottom to top.	
FC8-32 port blade	• 0 through 15 from bottom to top on the left set of ports. • 16 through 31 from bottom to top on the right set of ports.	
FC8-48 port blade	• 0 through 23 from bottom to top on the left set of ports. • 24 through 47 from bottom to top on the right set of ports.	
FC8-64 port blade	• 0 through 31 from bottom to top on the left set of ports. • 32 through 63 from bottom to top on the right set of ports.	• 0-7, 8-15, 16-23, 24-31, 32-39, 40-47, 48-55, and 56-63.
FS8-18 blade	• FC ports: 0 through 15 from bottom to top. • 10/100/1000 BaseT ports: GE0 and GE1 from the bottom.	
FX8-24 blade	• FC ports: 0 through 11 in two vertical rows of six ports starting from the bottom left and bottom right in the lower group of 12 ports. Labeled as FC on the front panel diagram. • 10-GbE ports: 0 and 1 in the left-hand column just above the FC ports. Labeled as 10GE on the front panel diagram. • 1-GbE ports: 0 through 9 in both columns above the FC and 10GE ports. Labeled as GE on the front panel diagram.	Up to three FC trunking groups are permitted. • Trunk group 0: FC ports 0, 1 • Trunk group 1: FC ports 6, 7 • Trunk group 2: FC ports 2, 3, 4, 5, 8, 9, 10, 11
FCOE10-24 blade	• 0 through 23 in two vertical rows from bottom left to top right.	

High availability

The following features contribute to the Brocade DCX high-availability design:

- Redundant, hot-swappable blades and FRUs
- Enhanced data integrity on all data paths
- Fabric Shortest Path First (FSPF) rerouting around failed links

- Integration with Simple Network Management Protocol (SNMP) managers
- Automatic control processor failover
- Nondisruptive "hot" software code loads and activation
- Easy configuration, save, and restore
- Hot-swappable World Wide Name (WWN) cards

The high-availability software architecture of the Brocade DCX provides a common framework for all applications that reside on the system, allowing global and local states to be maintained through any component failure. High-availability elements consist of the High Availability Manager, the heartbeat, the fault/health framework, the replicated database, initialization, and software upgrade.

The High Availability Manager controls access to the standby control processor, facilitates software upgrades, prevents extraneous switchover activity, closes and flushes streams, provides flow control and message buffering, and supports a centralized active and standby state.

Reliability

The Brocade DCX uses the following error detection and correction mechanisms to ensure reliability of data:

- Error Detection and Fault Isolation (EDFI) mechanism, which checks for encoder errors and fault isolation, such as cyclic redundancy checking (CRC), parity checking, checksum, and illegal address checking.
- Power-on self-test (POST).
- Dual control processors that enable hot, nondisruptive fast firmware upgrades.
- One serial port and two Ethernet ports (on each control processor) for management and for service. Offline control processor diagnostics and remote diagnostics simplify troubleshooting. The standby control processor monitors diagnostics to ensure it is operational, should a failover be necessary.
- Bus monitoring and control of blades and other field-replaceable units (FRUs).

Serviceability

The Brocade DCX provides the following features to enhance and ensure serviceability:

- Modular design with hot-swappable components
- Flash memory that stores two firmware images per control processor
- USB port on control processor blades for all tasks that formerly required an FTP/SCP server, including software and firmware upgrades
- Nonvolatile random-access memory (NVRAM), containing the OEM serial number, Brocade serial number, revision information, and part number information
- Background health-check daemon
- Memory scrubber, self test, and bus ping to determine if a bus is not functioning
- RASlog messages
- SMI-S compliant
- Watchdog timers
- Status LEDs
- Predictive diagnostics analysis through Fabric Watch

- SNMP (including version 3) integration with higher-layer managers

Software features

The Fabric OS allows any Fibre Channel-compliant device to attach to the switches as long as it conforms to the device login, name service, and related Fibre Channel standards. Each operating environment requires that a Fibre Channel host bus adapter (HBA) be available with a standards-compliant driver for correct interface to the fabric.

Fabric OS consists of a set of embedded applications running on top of an embedded Linux operating system kernel. These applications include:

- Name server
- Alias server
- Zone server
- Simple Network Management Protocol (SNMP) agent
- SMI-S compliant API
- Syslog auditing
- RCS (Reliable Commit Service)
- NTP
- Tasks to manage address assignment, routing, link initialization, fabric initialization, link shutdown, Brocade DCX shutdown, and the user interface

Security

The following table highlights some of the key security features available for the Brocade DCX and for other Brocade enterprise-class products running Fabric OS 5.2.0 or later. For details, contact your Brocade DCX supplier and refer to the Brocade White Paper, "The Growing Need for Security in Storage Area Networks".

TABLE 2 Brocade security features

Brocade Security Features	Description
DH-CHAP	Login banner
SSHv2 (using AES, 3DES, RSA)	Monitoring of attempted security breaches (through audit logging)
HTTPS (using AES)	Monitoring of attempted security breaches (through Fabric Watch Security Class)
SNMPv3	Fibre Channel security policies: DCC and SCC
FC-SP	Trusted Switch (FCS) for central security management
Secure RPC	Management access controls (SNMPv3, Telnet, FTP, serial port, front panel)
Secure file copy (SCP)	Hardware-enforced zoning by WWN, domain/port ID, or both
Telnet disable	Default zoning
Telnet timeout	RSCN suppression and aggregation
IP filters (block listeners)	Configurable RSCN suppression by port
Secure passwords (centralized control through RADIUS/CHAP)	NTPv3 (to synchronize timestamps)
Up to 255 multiple user accounts (MUAs).	Event auditing
Role-based access controls (RBACs)	Change tracking

TABLE 2 Brocade security features (continued)

Brocade Security Features	Description
Administrative domains/Virtual fabrics	Firmware change alerts in Fabric Manager
Boot PROM password reset	Persistent port disable
Password hardening policies	Persistent domain ID
Upfront login in Web Tools	E_Port disable

Network manageability

The Brocade DCX has a single domain and is managed as a single element with the Data Center Fabric Manager (DCFM). The Brocade DCX responds to its own IP address and appears as a separate entity to the Telnet protocol and SNMP.

All management interfaces, such as Telnet, Web Tools, standards-compliant SMI-S, and Management Server, support a "port N within blade M" naming scheme.

The Brocade DCX supports SNMPv1 and SNMPv3. When SNMP devices send SNMP messages to a management console running SAN management software, the information is stored in a management information base (MIB). Fabric OS v6.1.1_enc and later supports the latest Fibre Alliance Fibre Channel Management (FCMGMT) and Storage Management Initiative (SMI) MIBs, which allow common information necessary for management software to provide information to a SAN administrator. Refer to the *Brocade Fabric OS Administration Guide* for additional MIB information.

Preparing for the Installation

Installation and safety considerations

NOTE

Read the safety notices before installation.

Read the following sections before preparing to install the device.

- Caution and Danger Notices on page 165.
- Brocade DCX Backbone Technical Specifications on page 159, power supply specifications section, and plan for meeting the power supply standards based on your device configuration.
- Cable Management on page 47 and plan for cable management.

The following steps are required to ensure correct installation and operation:

1. Ensure that dedicated electrical branch circuits with the following characteristics are available:
   - 200-240 VAC, 50-60 Hz (two branch circuits)
   - 110-120 VAC, 50-60 Hz (up to four branch circuits)
   - Two cables for 200-240 VAC service; up to four cables for 110-120 VAC service
   - Power supply standards are met
   - Protected by a circuit breaker in accordance with local electrical codes
   - Supply circuit, line fusing, and wire size adequate to the electrical rating on the chassis nameplate
   - Location close to the chassis and easily accessible
   - Grounded outlets installed by a licensed electrician and compatible with the power cords

     ATTENTION

     To maximize fault tolerance, connect each power cord to a separate power source.
2. Plan for cable management before installing the chassis (Cable Management on page 47).

   Cables can be managed in a variety of ways, such as by routing cables below the chassis, to either side of the chassis, through cable channels on the sides of the cabinet, or by using patch panels.

3. Ensure that the following is available for configuration of the Brocade DCX:
   - Workstation with an installed terminal emulator, such as HyperTerminal
   - Serial cable (provided)
   - Three Ethernet cables (including one spare)
   - Access to an FTP server for backing up the switch configuration or collecting **supportsave** output data (optional)
   - A Brocade USB stick for collecting **supportsave** output data (optional)
   - SFPs and compatible cables

     NOTE
     For information about the SFP transceivers that are qualified for the Brocade Encryption Switch, go to http://www.brocade.com/products/interop_and_compatibility.jsp.
4. Ensure that the air intake and exhaust vents have a minimum of 2 inches of airspace.
5. Ensure that the air temperature on the air intake side is less than 40 degrees Celsius (104 degrees Fahrenheit) during operation.

Time and items required for installation

The following table describes the main installation and setup tasks, the estimated time required for each, and the items required to complete the task based on a fully populated Brocade DCX (512 Fibre Channel ports). Configurations with fewer ports require less time. These time estimates assume a prepared installation site and appropriate power and network connectivity.

TABLE 3 Installation tasks, time, and items required

Installation task	Time estimate	Items required
Site preparation and unpacking Brocade DCX	30 minutes	1/2-in. socket wrench (to remove pallet bolts). #2 Phillips screwdriver(for cable management comb). Pallet jack. Hydraulic lift or assisted lift, able to raise to a minimum of 140 cm (55 in.), with a minimum capacity of 113 kg (250 lb). The Brocade DCX weighs 159.2 kg (351 lb) with eight FC8-64 port blades installed (512 ports).
Installing rack mount kit	30 minutes	Refer to Mounting the Device on page 29 .
Mounting and securing Brocade DCX in rack	30 minutes	
Installing power cables and powering on the Brocade DCX	20 minutes	Power cables.
Establishing serial connection, logging on to Brocade DCX, and configuring IP addresses	20 minutes	Serial cable (provided in the accessory kit). Workstation computer with a serial port or terminal server port and a terminal emulator application (such as HyperTerminal). Ethernet IP addresses for the Brocade DCX and for both control processor blades: total three addresses.
Installing an Ethernet cable, opening a Telnet session, and configuring the Brocade DCX domain ID, date and time, and additional system parameters. Verify and back up configuration.	20 minutes	Ethernet cabling (optional) for Telnet access. Refer to the *Brocade Fabric OS Administration Guide*.

TABLE 3 Installation tasks, time, and items required (continued)

Installation task	Time estimate	Items required
Installing SFP, SFP+, mSFP, and XFP (10-Gbps) optical transceivers as needed	30 minutes	SFP, SFP+, mSFP, and XFP (10-Gbps) optical transceivers as needed.
Attaching fiber optic cables, cable ties, and cable guides	2-3 hours	Fiber optic cables, cable ties, and cable comb.

Items included with the device

The Brocade DCX ships with the following:

- Brocade DCX chassis, populated with:
  - Control processor blades (CP8)
  - Core switch blades (CR8)
  - Port blades and application blades, and encryption blades (included based on customer specification)
  - Blade slot filler panels (for slots not filled by a port, control processor, or core switch blade)
  - WWN cards
  - WWN bezel (logo plate)
  - Power supplies
  - Power supply filler panels (included if there are fewer than four power supplies)
  - Blower assemblies
  - Cable management comb
  - Chassis door
- Accessory kit containing the following items:
  - ESD grounding strap
  - USB device
  - RS-232 serial cable. The RS-232 cable has an adapter at one end that can be removed to provide an RJ-45-style connector.
- 14U Rack Mount Kit with instructions (includes rear brackets and bottom support rails)

Order the optical transceivers (SFP, SFP+, mSFP, and XFP) from Brocade. The Brocade DCX supports SWL, LWL, and ELWL transceivers. The mSFPs are SWL transceivers only.

NOTE

For information about the SFP, SFP+, mSFP, and XFP transceivers that are qualified for the Brocade DCX, go to http://www.brocade.com/products/interop_and_compatibility.jsp.

Mounting the Device

Mounting precautions

Ensure that the following amount of space is available in the rack.

NOTE
1U is equal to 4.45 cm (1.75 inches).

- 14 rack units (14U) high
- 61.29 cm (24.09 in.) deep
- 43.74 cm (17.22 in.) wide

The following general considerations for mounting the device.

- Review Installation and safety considerations on page 25 before mounting the device and ensure that all facility requirements are met.
- The device can be installed facing either direction in a cabinet, if serviceability and cooling requirements are met.
- Plan to install the device with the nonport side facing the air-intake aisle. The device can be installed facing either direction, if serviceability and cooling requirements are met.
- Ensure that the air intake and exhaust vents have a minimum of 5.1 cm (2 in.) of airspace.
- Ensure that the air temperature on the air intake side is less than 40°C (104°F) during operation.
- Use a hydraulic lift or assisted lift that can raise a minimum of 140 cm (55 in.), with a minimum capacity of 115 kg (254 lb). Refer to Brocade DCX Backbone Technical Specifications on page 159 for the weight of your device, fully populated with the required blades.

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

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
Use safe lifting practices when moving the product.

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.

CAUTION
Never leave tools inside the chassis.

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

Mounting options

This device can be installed as a standalone unit on a flat surface or mounted a 19-inch Electronic Industries Association (EIA) or two-post telecommunications (TELCO)equipment rack.

- In a four-post 19 in. (48.3 cm) EIA rack:
  - Use the 14U rack mount kit for four-post racks (XBR-DCX-0120), which contains shelf brackets that telescope from 27 in. (68.58 cm) to 31 in. (78.74 cm) to fit the majority of racks.
  - Use the 14U rack mount kit for four-post racks (XBR-DCX-0152), which contains 22 in. (55.88 cm) fixed shelf brackets designed for specific racks.
  - Refer to Installing the 14U Rack Mount Kit for Four-Post Racks (XBR-DCX-0120 and XBR-DCX-0152) on page 31 for instructions.
- In a two-post Telco rack:
  - Use the 14U mid-mount rack kit for two-post racks (XBR-DCX-0121).
  - Refer to Installing the 14U Chassis Mid-Mount Rack Kit for Two-Post Racks (XBR-DCX-0121) on page 39 for instructions.

NOTE
Review the Installation and safety considerations on page 25 before mounting the device and ensure that all facility requirements are met.

NOTE
The preceding rack mount kits are supported for this device at the publication date of this Hardware Installation Guide. For current support information, contact your Brocade representative.

Unpacking, transporting, and installing the device

DANGER
Use safe lifting practices when moving the product.

DANGER
A fully populated Brocade DCX (eight FC8-64 port cards, 512 ports) weighs approximately 159.2 kg (351 lbs) and requires a hydraulic or assisted lift to install it.

Use the following steps to unpack, transport, and install the device.

1. Unpack and install the Brocade DCX.
   a) Cut the bands that encircle the packaging.
   b) Remove the lid and the kits and foam from the top of the chassis.
   c) Lift the cardboard box off the chassis and remove the plastic bag from around the chassis. Save the packing materials for use when returning the old chassis.
   d) Leave the chassis on top of the plastic shipping tray if the chassis must be transported to the installation location.

      NOTE
      The Brocade DCX packaging does not incorporate a wood pallet and pallet brackets. The chassis sits on top of a plastic shipping tray.
2. Use a pallet jack or other assisted lift to transport the new chassis to the installation area. Doorways must be wider than 91 cm (36 in.) to accommodate the chassis.
3. Remove the 14U Rack Mount Kit, accessory kit, packing foam, and antistatic plastic from the chassis and set aside.
4. Install the rack mount kit in the rack using appropriate instructions in this Hardware Installation Guide.
5. Remove the chassis door from the Brocade DCX.
6. Remove the cable management comb.
7. Use a lift to raise the chassis to the correct level. Follow the instructions provided by the rack kit manufacturer.
8. If applicable, lock the wheels of the lift.
9. Gently slide the chassis onto the final installation surface, ensuring that it remains supported during the transfer.
10. Ensure that the chassis is oriented so that the nonport side has access to intake air (cool).
11. Reinstall the cable management comb.
12. If ICL cables will not be used, ensure that the ICL sockets in the core switch blades have EMI plugs inserted.
13. Reinstall the chassis door.

Installing the 14U Rack Mount Kit for Four-Post Racks (XBR-DCX-0120 and XBR-DCX-0152)

Use the following instructions to install a modular device in a 19-in. (48.3 cm) EIA rack using the 14U Rack Mount Kit for Four-Post Racks (XBR-DCX-0120 and XBR-DCX-0152).

Two rack-mount kits are available.

- XBR-DCX-0120 - Contains shelf brackets that telescope from 27 in. (68.58 cm) to 31 in. (78.74 cm) to fit the majority of racks.
- XBR-DCX-0152 - Contains 22 in. (55.88 cm) fixed shelf brackets that adjust to 27 in. (68.58 cm).

Observe the following when mounting this device:

- Use Electronic Industries Association (EIA) standard racks. Ensure that the space in the 19-in. (48.3 cm) EIA rack is 14U high.
- Verify that the additional weight of the chassis does not exceed the weight limits of the rack.
- Before mounting your device, review any specific installation and facility requirements in this Hardware Installation Guide.
- Hardware devices illustrated in these procedures are only for reference and may not depict the device you are installing into the rack.

Time and items required

Allow approximately one hour to unpack and install a device in a rack.

The following tools are required when installing the 14U Rack Mount Kit for Four-Post Rack:

- Torque screwdriver with #2 Phillips screwdriver tip
- Slotted (flat blade) screwdriver
- Hydraulic or assisted lift with a minimum raise of 140 cm (55 in.) and a minimum capacity of 113 kg (250 lb)

Parts list

The following table lists 14U Rack Mount Kit parts and quantities for different installations. Refer to the illustration following the table to identify these parts.

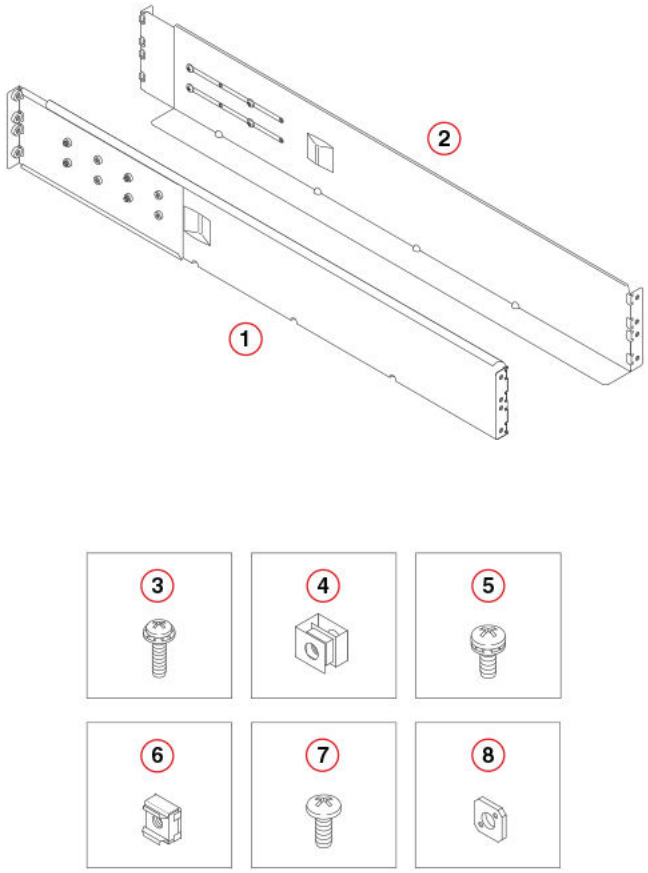
TABLE 4 14U rack mount kit parts and quantities

Description	Installation	Quantity
Left rack mount shelf bracket (rail brackets may differ from ones shown in illustration)	All	1
Right rack mount shelf bracket (rail brackets may differ from ones shown in illustration)	All	1
10-32 x 5/8 in. (1.58 cm) panhead Phillips screw and washer (torque to 32 in-lb, [37 cm-kg])	All	6
10-32 clip nut	For rack rails with round holes	6
1/4-20 x 1/2 in. (1.27 cm) panhead Phillips screw with lock washer (torque to 80 in-lb [92 cm-kg])	For rack rails with round holes	16
10-32 retainer nut	For rack rails with square holes	6
1/4-20 x 1/2 in. (1.27 cm) panhead Phillips screw with thread locker (torque to 80 in-lb [92 cm-kg])	For rack rails with square holes	16
3/8 in. (0.953 cm) alignment washer	For rack rails with square holes	16

NOTE

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

FIGURE 3 14U rack kit parts



1. Left rack mount shelf bracket
2. Right rack mount shelf bracket
3. 10-32 x 5/8 in. (1.58 cm) panhead Phillips screw and washer
4. 10-32 clip nut for cabinets that have rails with round holes
5. 1/4-20 x 1/2 in. (1.27 cm) panhead Phillips screw with lock washer for cabinets that have rails with round holes
6. 10-32 retainer nut for cabinets that have rails with square holes
7. 1/4-20 x 1/2 in. (1.27 cm) panhead Phillips screw with thread locker for cabinets that have rails with square holes
8. 3/8 in. (0.953 cm) alignment washer for cabinets that have rails with square holes

Parts list – NEBS kit

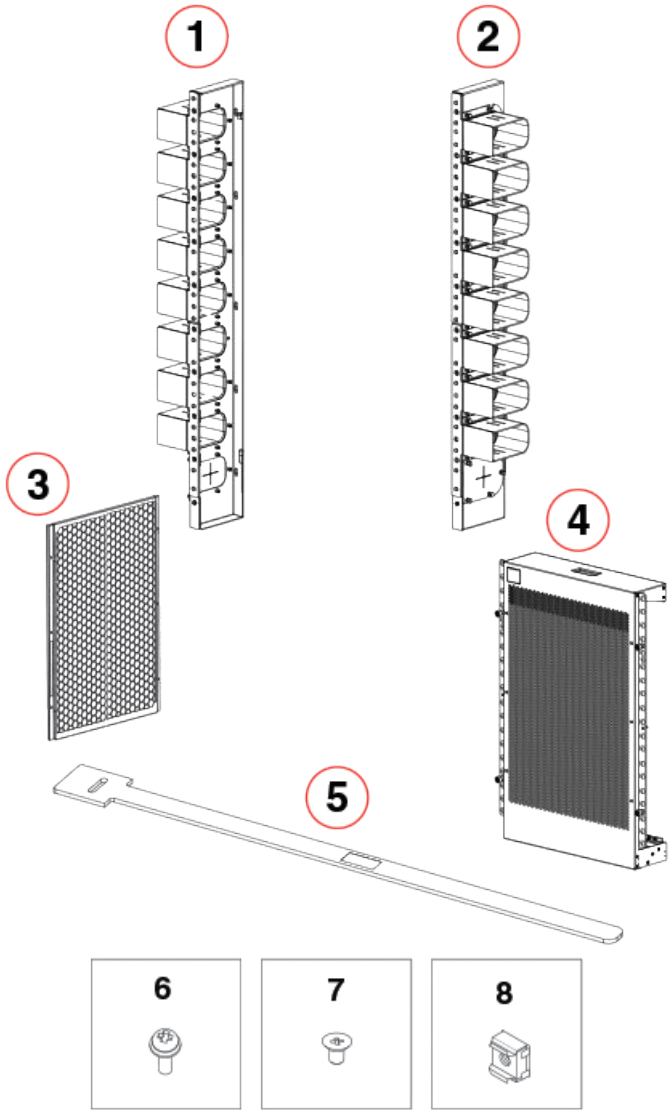
The following table lists the parts supplied in the XBR-SLX9850-8-NEBS-KIT to help direct airflow away from the rack area. This kit is only supported for specific devices, and may not apply to the device that you are installing.

NOTE

Depending on the device and installation, not all of the parts may be used.

Verify that the items listed in the following figure are included in the NEBS kit.

FIGURE 4 NEBS kit parts list



1. Left cable comb assembly (1)
2. Right cable comb assembly (1)
3. Air filter (1)
4. Chassis door (1)
5. Velcro strap (8)
6. Screw, 10-32 x .63-in., square cone washer (10)
7. Screw, 8-32 x .312 in., flathead (20)
8. Nut retainer (6)

Assembling the rack hardware

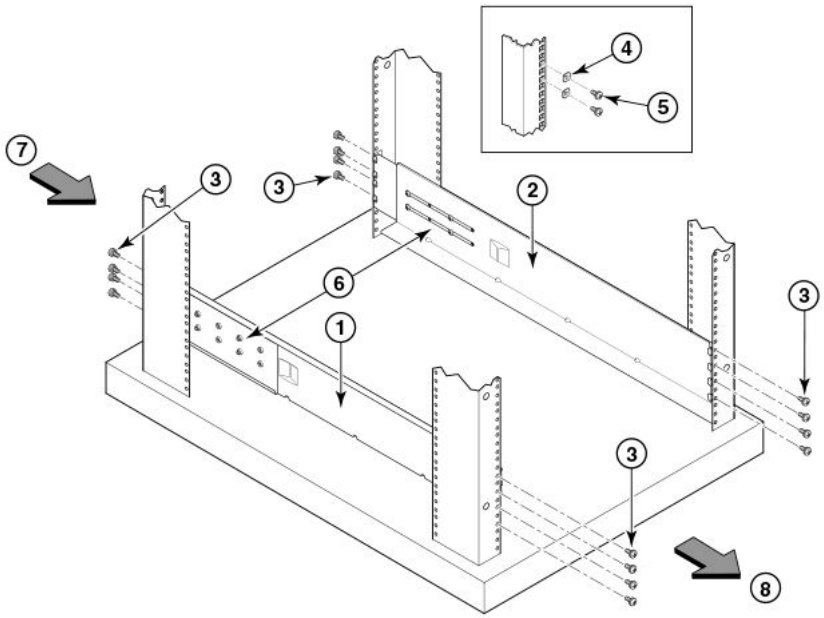
Attach the left and right rack mount shelf brackets to the rack rails.

NOTE
If cables are to be routed down through the cable management comb, allow space below the brackets for cable management

1. Locate the shelf brackets in the device.

2. Locate and loosen the screws on the adjustable ends of the brackets (see the following figure) to allow for adjustment to rack depth.

FIGURE 5 Left and right shelf brackets installed on rails



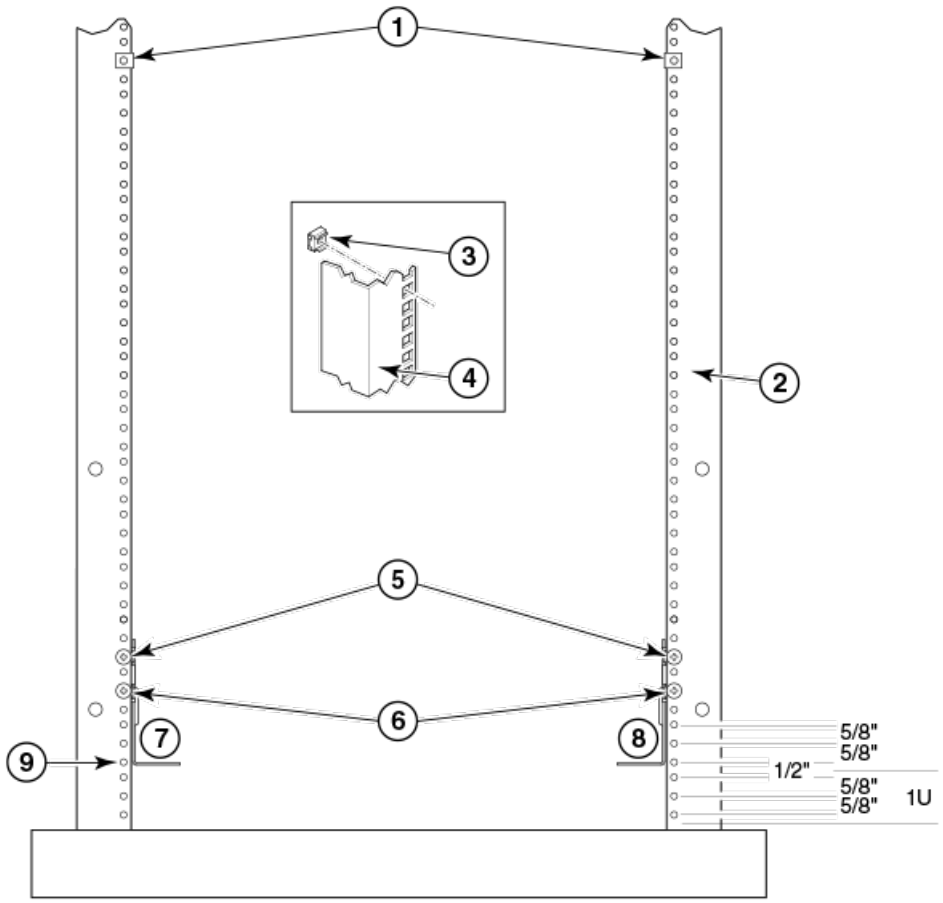
1. Left rack mount shelf bracket
2. Right rack mount shelf bracket
3. 1/4-20 x 1/2 in. (1.27 cm) panhead Phillips screw with lock washer for rails with round holes (4 on each end of each bracket, 16 total)
4. 3/8 in. (0.953 cm) alignment washer for rails with square holes (4 on each end of each bracket, 16 total)
5. 1/4-20 x 1/2 in. (1.27 cm) panhead Phillips screw with thread locker for rails with square holes (4 on each end of each bracket, 16 total)
6. Adjustable ends of shelf brackets
7. Intake air direction
8. Exhaust air direction

CAUTION

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

3. Position the shelf brackets with the adjustable ends on the intake air aisle side of the rack (see the previous figure).
   - For rails with round holes:
     - Position the left and right rack mount shelf brackets and attach them to the rack rails. Use eight screws with lock washers per bracket (four on each end). Tighten the screws to a torque of 80 in-lb (92 cm-kg).
   - For rails with square holes:
     - Position the left and right rack mount shelf brackets and attach them to the rack rails. Use eight screws and alignment washers per bracket (four on each end). Tighten the screws to a torque of 80 in-lb (92 cm-kg).

FIGURE 6 Nut and screw locations for mounting the device



1. 10-32 clip nuts (for round holes)
2. Rail
3. 10-32 retainer nut (for square holes)
4. Rail
5. Top screws in shelf bracket
6. Bottom screws in shelf bracket
7. Left rack mount shelf bracket
8. Right rack mount shelf bracket
9. Hole 1

NOTE

Standard EIA rails have holes in sets of three; spaces between the holes are 5/8 in., 5/8 in., and 1/2 in. (1.58 cm, 1.58 cm, and 1.27 cm).

4. Tighten the adjusting screws on the sliding portion of the rack mount shelf brackets to a torque of 32 in-lb (37 cm-kg).

5. Attach the clip nuts (for rails with round holes) or retainer nuts (for rails with square holes) to the vertical rails on the exhaust aisle side of the rack (see the previous figure). These clip nuts are used for securing the port side of the device to the rack rails using 10-32 x 5/8 inch screws. Use three clips on each rail. Place the clips in optimum locations for securing the device to the rails.

   NOTE
   Do not align the clip or retainer nuts with the top or bottom holes of the mounting bracket because the screw heads will interfere with the door.

Installing the device in the rack

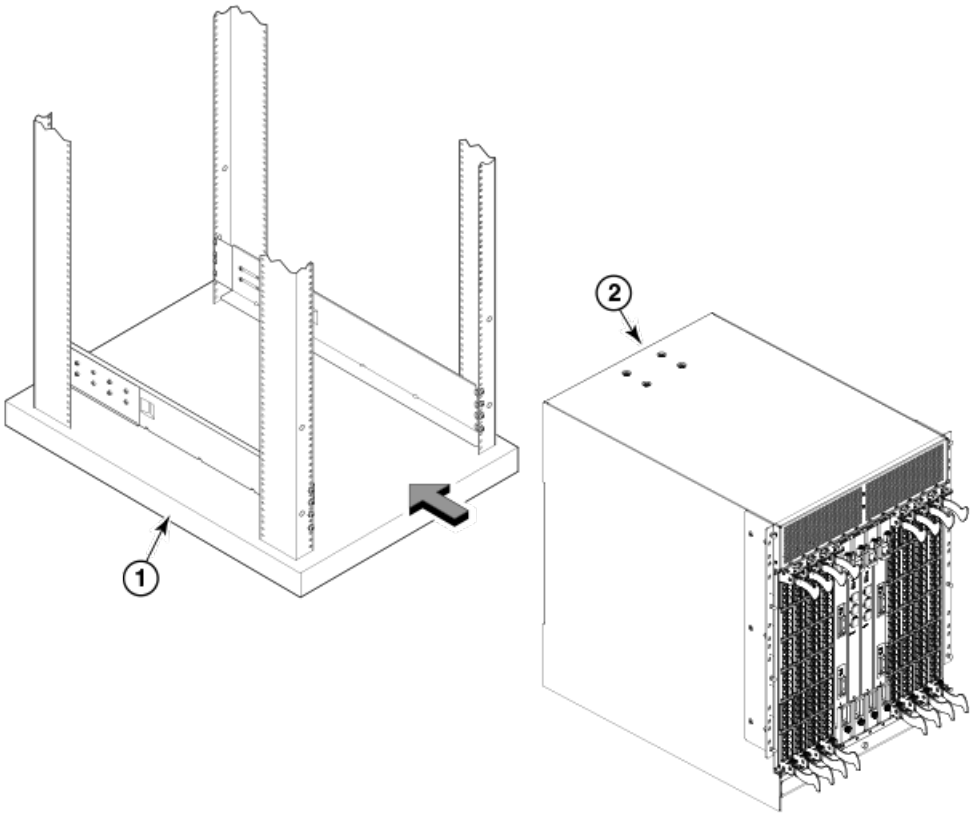
Use the following procedure to install the device in the rack.

DANGER
Use safe lifting practices when moving the product.

1. Ensure that the door, if installed, is removed from the port side of the device. For instructions, refer to instructions for removing and replacing the device door in the device installation guide.
2. Use a lift to raise the device to the level of the shelf brackets.
3. Move the lift as close as possible to the rack, with the air-intake side of the device facing the front of the rack (see the following figure).
4. If applicable, lock the wheels of the lift.

5. Gently slide the device onto the shelf brackets, ensuring that it remains supported during the transfer.

FIGURE 7 Positioning the device for installation in a rack

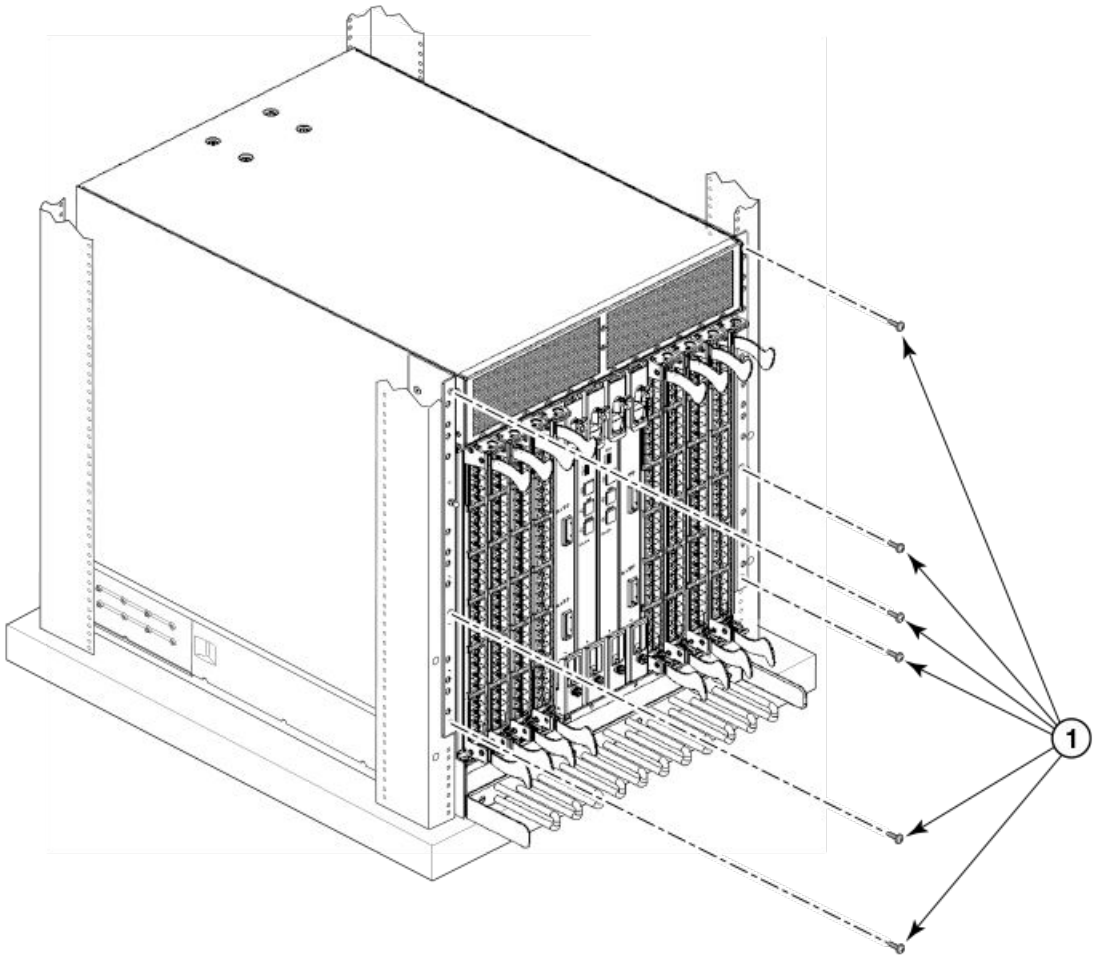


1. Rack
2. Nonport side of device

6. Fasten the port side of the device to the rack rails. Use three 10-32 x 5/8 inch (1.58 cm) screws per rail. Tighten the screws to a torque of 32 in-lb (37 cm-kg). Refer to Figure 8.

   NOTE
   Do not use the top or bottom holes of the mounting bracket because the screw heads will interfere with the door.

FIGURE 8 Attaching port side of device to rack rails



1. 10-32 x 5/8 in. (1.58 cm) panhead Phillips screw with washer

7. Reinstall the device door if removed from your device. For instructions, refer to the door removal and replacement procedures in your device installation guide.

Installing the 14U Chassis Mid-Mount Rack Kit for Two-Post Racks (XBR-DCX-0121)

Use the following instructions to install a Brocade modular device in a telecommunications (Telco) rack, using the 14U Chassis Mid-Mount Rack Kit for Two-Post Racks (XBR-DCX-0121).

Observe the following when mounting this device:

- The kit is compatible with rack rails that are either 3 inches or 5 inches wide (adapters are provided for 3-in. rails).
- 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 approximately one hour to unpack and install a chassis in a rack.

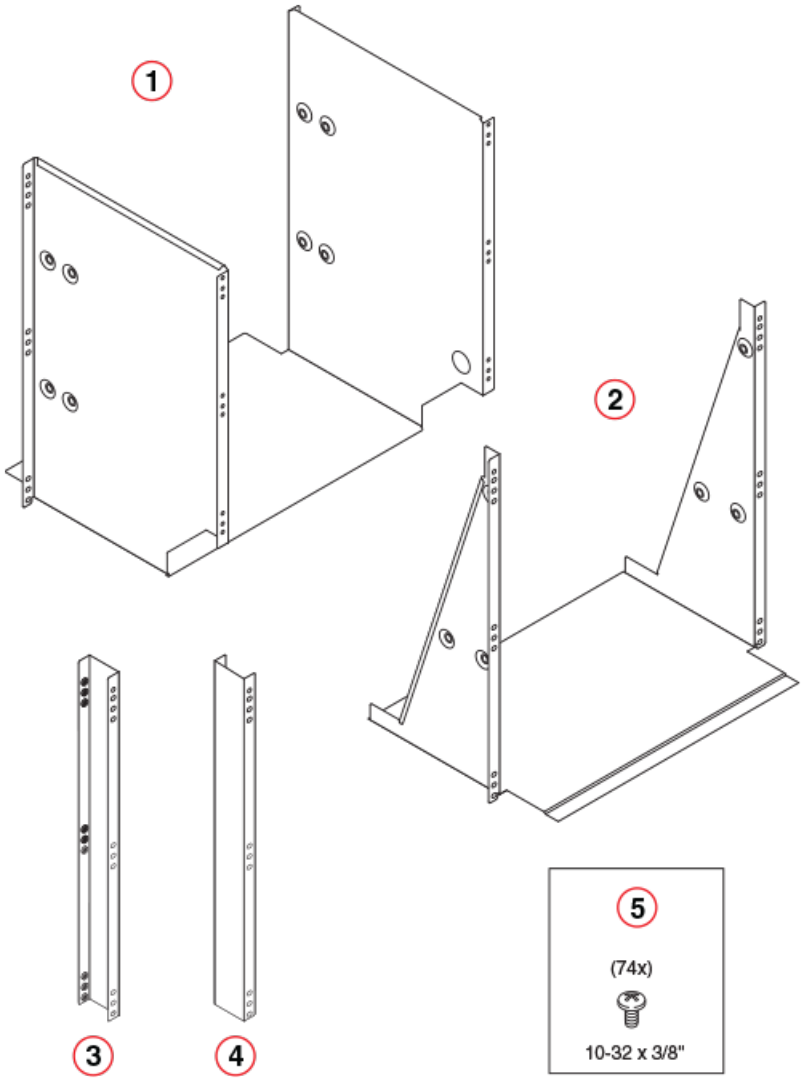
The following tools are required when installing the 14U Chassis Mid-Mount Rack Kit for Two-Post Racks.

- Torque wrench with #2 Phillips screwdriver tip
- Flathead screwdriver
- Hydraulic or assisted lift with a minimum raise of 140 cm (55 in.) and a minimum capacity of 113 kg (250 lbs).

Parts list

The following parts are provided with the 14U Chassis Mid-Mount Rack Kit for Two-Post Racks (XBR-DCX-0121).

FIGURE 9 Rack kit parts



1. Tray, front, mid-mount, chassis
2. Tray, rear, mid-mount, chassis
3. Adapter, rear, mid-mount, right
4. Adapter, rear, mid-mount, left
5. Screw, 10-32 x 3/8", pan head Phillips, ST, zinc (requires a torque of 32 inch-pounds)

NOTE

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

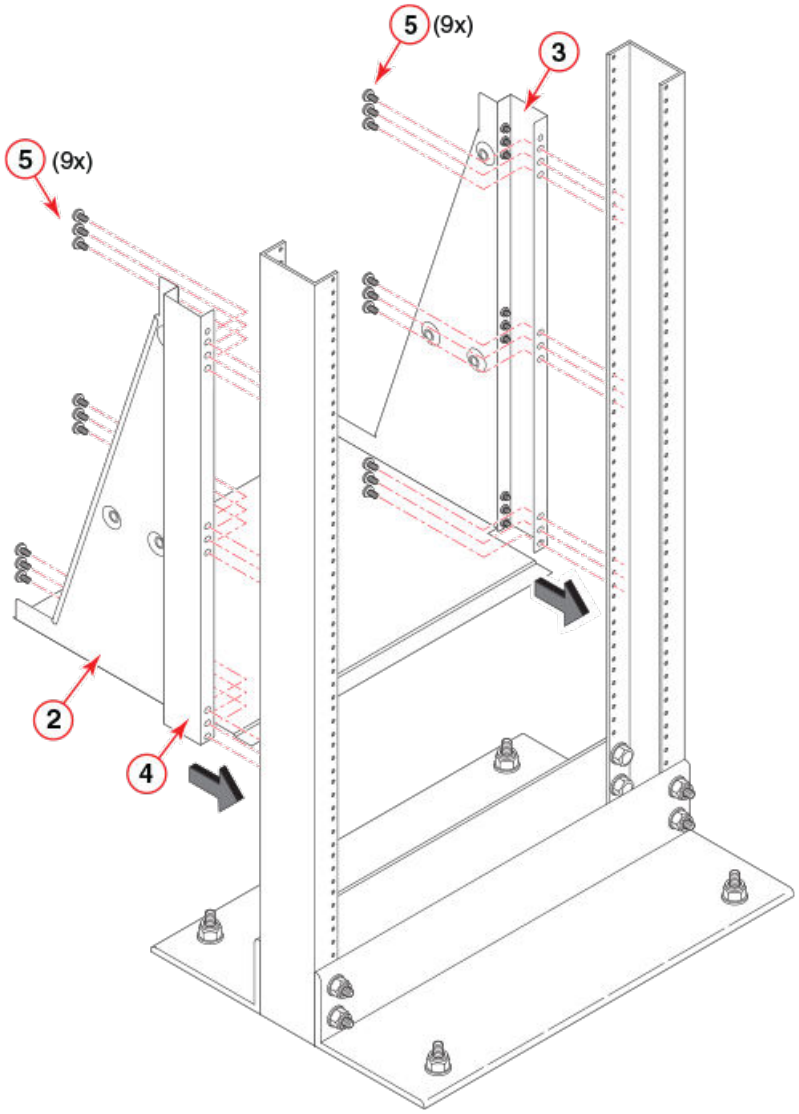
Assembling the rack hardware

Perform the following steps to assemble the rack hardware.

1. Attach the rear tray (with or without adapter, as required) to both rack rails. Orient the tray (refer the following figure) and use nine screws (Item E) for each rail.
2. Attach the front tray to both rack rails. Orient the tray (Figure 11) and use nine screws (Item E) for each rail.

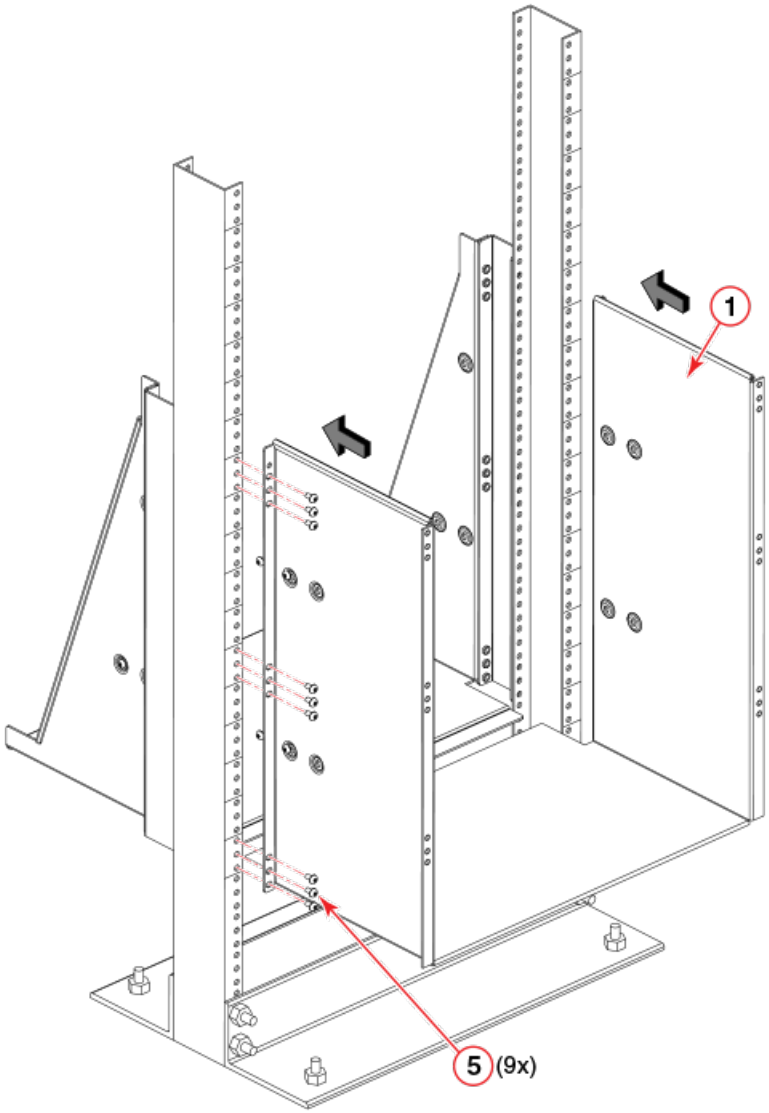
3. Verify that the rear edge of the front tray is seated into the front edge of the rear tray.

FIGURE 10 Attaching the rear tray to the rack rails



2. Tray, rear, mid-mount, chassis
3. Adapter, rear, mid-mount, right
4. Adapter, rear, mid-mount, left
5. Screws

FIGURE 11 Attaching the front tray to the rack rails



1. Tray, front, mid-mount, chassis
5. Screws

Installing the device in the rack

DANGER

Use safe lifting practices when moving the product.

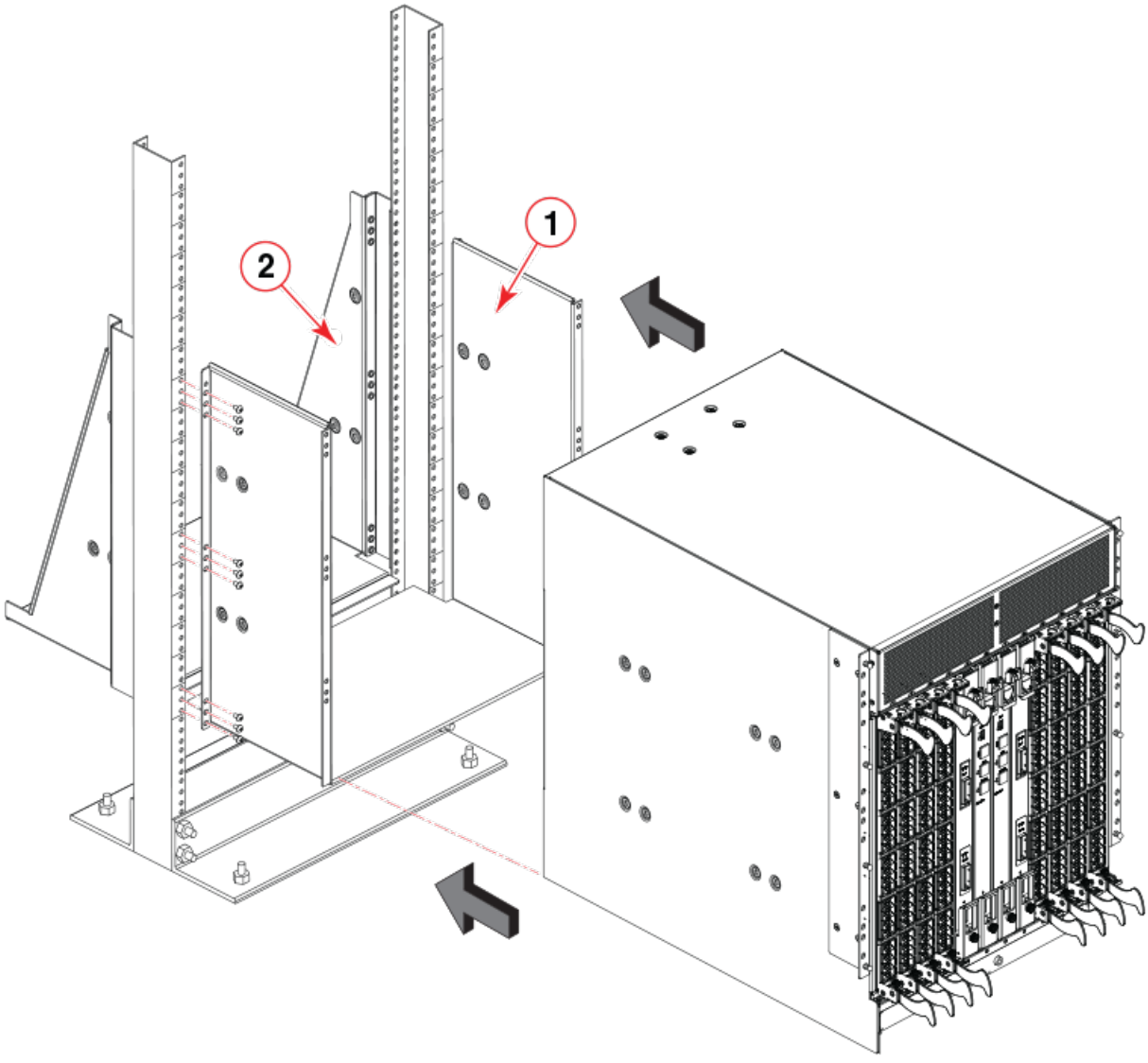
NOTE

A fully populated device requires a hydraulic or assisted lift to install into a rack.

Perform the following steps to load the device into the mid-mount trays.

1. Ensure that the door is removed from the port side of the device. For instructions, refer to the door removal and replacement procedures in your device installation guide.
2. Orient the device (refer the following figure) and use a hydraulic lift to raise it to the level of the trays.
3. If applicable, lock the wheels of the lift.
4. Slide the device into the trays until the front edge of the device is seated against the front tray.

FIGURE 12 Placing the device in the trays



1. Tray, front, mid-mount, chassis
2. Tray, rear, mid-mount, chassis

5. Use three screws (Item 5) to attach each side of the rear tray to the device (refer the following figure).

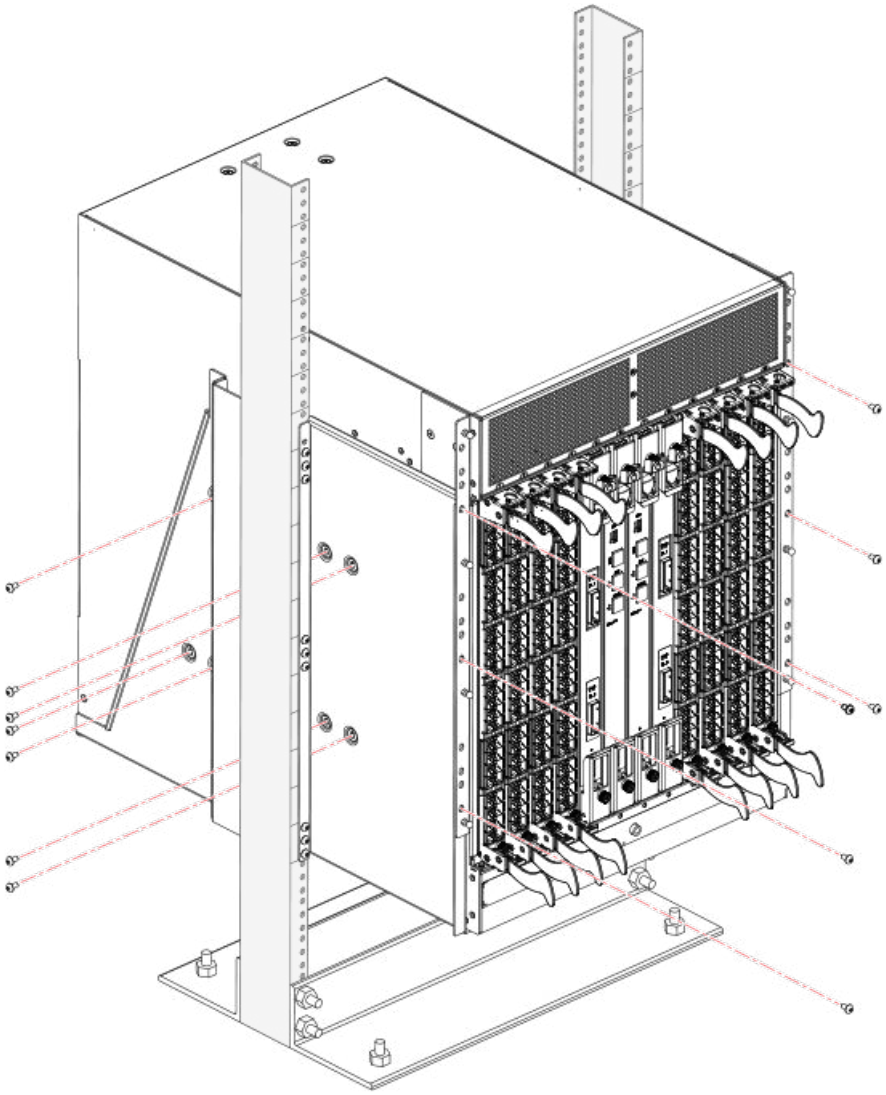
NOTE

The screw holes in the device walls have pem nuts on the inside surface.

6. Use four screws (Item 5) to attach each side of the front tray to the device
7. Use six screws (Item 5) to attach the lip on each side of the front tray to the lip on the front of the device.

NOTE
Do not use the top or bottom holes of the Brocade mounting bracket because the door will interfere with the screw heads.

FIGURE 13 Attaching trays to the device



8. Reinstall the device door. For instructions, refer to the door removal and installation instructions in your device installation guide.

Cable Management

Requirements and precautions

The cable management comb is attached to the chassis under the chassis door and allows for simple cable management. The comb can be installed without service disruption.

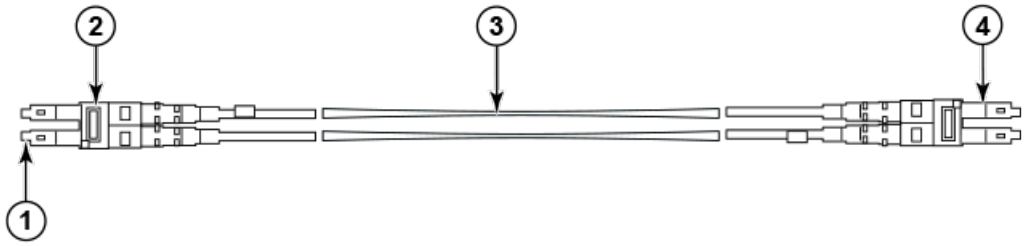
Route the cables down in front of the blades to keep LEDs visible. Leave at least one meter of slack for each fiber optic cable to provide room to remove and replace blades.

ATTENTION
Do not route the cables in front of the air exhaust vent, which is located at the top of the port side of the chassis.

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.

The FC8-64 high density port blade cannot use the standard LC cables because the pitch between optics in the new mSFP transceiver is smaller than in standard SFPs. Patch cables and panels can be used to attach standard size cabling to the blade if necessary. The following figure illustrates the mSFP to SFP patch cable. See "Best Practices Guide: High Density Cable Management Solutions" (available at http://www.brocade.com) for cable management guidelines for high-density port solutions, cable and patch panel part numbers.

FIGURE 14 Cable design for the mSFP patch cables for the FC8-64 high density port blade



1. mini-SFP connector
2. Duplex clip (black)
3. 1.6 mm cable
4. SFP connector

Please note that the duplex clip on the mSFP end of the cable is black for easier recognition. See Qualified cables for the FC8-64 port blade on page 48 for a listing of the qualified mSFP optical cables for the FC8-64 port blade.

If ISL Trunking is in use, group the cables by trunking group. The ports are color-coded to indicate which ports can be used in the same ISL Trunking group: eight ports marked with solid black ovals alternate with eight ports marked with oval outlines.

Qualified cables for the FC8-64 port blade

The following table lists the third party cables that have been qualified for use with the mSFP transceivers in the FC8-64 high density port blade.

TABLE 5 Qualified cables for mSFP connections for the FC8-64 high density port blade

Description	Length	Corning part number	Molex part number	Amphenol part number
Patch cables - mSFP to LC		S50502S5120XXXM (XXX = length)		943-99865-1XXXX (XXXX = length)
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	1 m	S50502S5120001M	106273-0525	943-99865-10001
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	2 m	S50502S5120002M	106273-0526	943-99865-10002
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	3 m	S50502S5120003M	106273-0527	943-99865-10003
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	5 m	S50502S5120005M	106273-0528	943-99865-10005
mSFP LC - standard LC, duplex, multi-mode, OM3, 50/125	10 m	S50502S5120010M	106273-0529	943-99865-10010
Patch cables - mSFP to mSFP		S5S502S5120XXXM (XXX = length)		943-99866-1XXXX (XXXX = length)
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	1 m	S5S502S5120001M	106273-0560	943-99866-10001
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	2 m	S5S502S5120002M	106273-0561	943-99866-10002
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	3 m	S5S502S5120003M	106273-0562	943-99866-10003
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	5 m	S5S502S5120005M	106273-0563	943-99866-10005
mSFP LC - mSFP LC, duplex, multi-mode, OM3, 50/125	10 m	S5S502S5120010M	106273-0564	943-99866-10010
Trunk cables - mSFP to MTP		tbd		
mSFP LC - MTP-female, 12 fiber, 12" breakout, OM3, 50/125		H93S5TE9-BMU-XXXM (XXX = length)		943-99867-1XXXX (XXXX = length)
mSFP LC - MTP-female, 12 fiber, 6" breakout, OM3, 50/125	2m		106272-0327	
mSFP LC - MTP-female, 24 fiber, 12" breakout, OM3, 50/125	2m		106272-0328	

TABLE 5 Qualified cables for mSFP connections for the FC8-64 high density port blade (continued)

Description	Length	Corning part number	Molex part number	Amphenol part number
Bag of clips (quantity 64)		TRIGGER-BP-NP	n/a	n/a

Installing ICL cables (optional)

Go to Removal and replacement of the inter-chassis link (ICL) cables on page 115 for the procedure to install the ICL cables

Logging In and Configuring the DCX Backbone

Items required

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

- The device, mounted and installed with the required blades, FRUs, transceivers, and cables and is connected to a power source.
- A workstation computer with an installed terminal emulator application, such as HyperTerminal for Windows.
- Unused IP addresses with corresponding subnet mask and gateway addresses for the device and for both management modules (total of three addresses).
- A serial cable (provided) with an RJ-45 connector.
- An RJ-45 to DB-9 adapter.
- Three Ethernet cables (including one spare)
- Access to an FTP server or USB device for backing up (uploading) or downloading the device configuration or collecting **supportsave** output data (optional).
- A Brocade USB drive for collecting **supportsave** output data (optional)

Providing power to the DCX Backbone

ATTENTION
Use the supplied power cords. Ensure the facility power receptacle is the correct type, supplies the required voltage, and is properly grounded. (D004)

1. Connect the AC power cords to the power supply assemblies. One to four power cords are required depending on electrical service.
2. Connect the power cords to a power source with voltage of 200 to 240 VAC, 47 to 63 Hz (normally two power cords or as many as four) or to a power source with voltage of 110 to 120 VAC, 47 to 63 Hz (two to four power cords).

   ATTENTION
   Use of the high-voltage line (200 to 240 VAC) is highly recommended because of better power-conversion efficiency.
3. Turn the AC power switches on the power supplies to ON. The AC power switches light green when switched on and power is supplied.
4. The Brocade DCX performs a power-on self-test (POST) each time it is powered on. POST takes approximately 10 minutes and is complete when the indicator light activity displays the operational state. For information about LED patterns, see Monitoring System Components on page 63.

   You can bypass POST by using the **fastBoot** command. You can also disable POST for successive reboots on the Brocade DCX using the **diagDisablePost** command.

   ATTENTION
   Do not connect the switch to the network until the IP addresses are configured.

Configuring the Brocade DCX

The Brocade DCX must be configured before it is connected to the fabric, and all of the configuration commands must be entered through the active CP blade. The Brocade DCX configuration includes the following parameters:

- IP address and subnet mask for the chassis
- IP addresses, host names, subnet masks, and gateway addresses for both CP blades
- Switch name
- Domain ID for the Brocade DCX (optional)
- WWN for the Brocade DCX

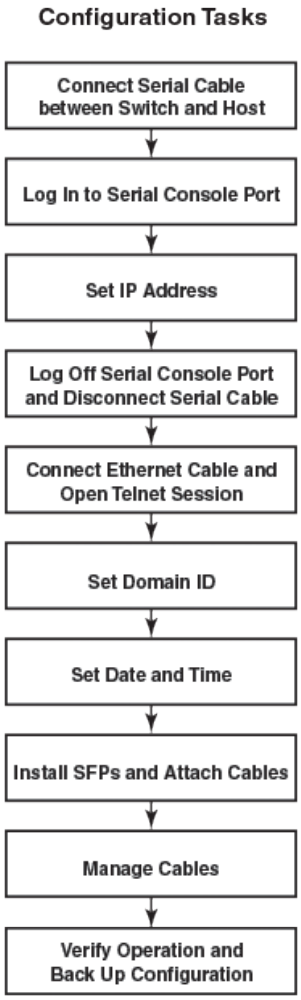
The Brocade DCX WWN is initially set by the factory to match the license ID (which is based on the chassis serial number).

The configuration information is mirrored to the standby CP blade, which allows the current configuration to remain available even if the active CP blade fails. The configuration information for the Brocade DCX is stored in the WWN cards and the flash memory of the CP blades. The configuration can be backed up to a workstation (uploaded) and then downloaded to the active CP blade if necessary.

NOTE
If the Brocade FS8-18 encryption blade is installed, refer to the *Fabric OS Encryption Administrator's Guide for the procedures to configure the encryption functions*

The following figure illustrates the flow of the basic configuration tasks.

FIGURE 15 Configuration tasks



Establishing a serial connection and logging on to the Brocade DCX

1. Verify that the Brocade DCX is powered on and that POST is complete by verifying that all power LED indicators on the port, control processor, and core switch blades display a steady green light.
2. Remove the shipping cap from the CONSOLE port on the active CP. Use the serial cable provided with the Brocade DCX to connect the CONSOLE port on the active CP to a computer workstation. The active CP blade is indicated by an illuminated (blue) LED.

   ATTENTION
   The CONSOLE port is intended primarily for the initial setting of the IP address and for service purposes.
3. Access the Brocade DCX using a terminal emulator application (such as HyperTerminal in a Windows environment or tip in a UNIX environment).
4. Disable any serial communication programs running on the workstation (such as synchronization programs).

5. Open the terminal emulator application and configure as follows:

   For most MS Windows systems:

   Bits per second: 9600Databits: 8Parity: NoneStop bits: 1Flow control: None

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

   In a UNIX environment, type 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
   ```

   When the terminal emulator application stops reporting information, press **Enter** . You receive the following login prompt:

   ```
   CP0 Console Login:
   ```

Logging in to the serial console port

To log in to the Brocade DCX through the serial connection, follow these steps.

1. Log in to the Brocade DCX as **admin**. The default password is *password*. You are prompted to change the default 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.

   Password was not changed. Will prompt again at next login
   until password is changed.
   swDir:admin>
   ```

2. (Optional) Modify passwords. To skip modifying the password, press Ctrl-C. For more information on passwords, refer to the *Brocade Fabric OS Administration Guide*.

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

Configuring the IP addresses

The Brocade DCX requires three IP addresses, which are configured using the **ipAddrSet** command. IP addresses are required for both CP blades (CP0 and CP1) and for the chassis management IP (shown as SWITCH under the **ipAddrShow** command) in the Brocade DCX.

NOTE
The default IP addresses and host names for the Brocade DCX are:- 10.77.77.75 / CP0 (the CP blade in slot 6 at the time of configuration)- 10.77.77.74 / CP1 (the CP blade in slot 7 at the time of configuration)

ATTENTION
Resetting an IP address while the Brocade DCX has active IP traffic or has management and monitoring tools running, such as DCFM, Fabric Watch, and SNMP, can cause traffic to be interrupted or stopped.

1. Log in to the active CP as admin using the serial cable connection.
2. Set up the Brocade DCX IP address by entering the **ipaddrset -chassis** command:

```
swDir:admin> ipAddrSet -chassis
```

Enter the information at the prompts. Specify the **-chassis** IP address. The **-sw 0** IP address is no longer valid on this chassis.

NOTE
The addresses 10.0.0.0 through 10.0.0.255 are reserved and used internally by the Brocade DCX. External IP addresses must not use these addresses.

3. Set up the CP0 IP address by entering the **ipaddrset -cp 0** command:

```
swDir:admin> ipAddrSet -cp 0
```

Enter the information at the prompts.

4. Set up the CP1 IP address by entering the **ipaddrset -cp 1** command:

```
swDir:admin> ipAddrSet -cp 1
```

Enter the information at the prompts.

This is a sample IP configuration:

```
swDir:admin> ipaddrset -chassis
Ethernet IP Address [0.0.0.0]: 123.123.123.120
Ethernet Subnetmask [0.0.0.0]: 123.123.123.123
Fibre Channel IP Address [0.0.0.0]:
Fibre Channel Subnetmask [0.0.0.0]:
Issuing gratuitous ARP...Done.
Committing configuration...Done.

swDir:admin>
 ipaddrset -cp 0
Host Name [cp0]:
Ethernet IP Address [10.77.77.75]: 123.123.123.121
Ethernet Subnetmask [0.0.0.0
]: 123.123.123.123
Gateway IP Address [0.0.0.0
]: 123.123.123.124
IP address is being changed...Done.
Committing configuration...Done.
swDir:admin> ipaddrset -cp 1
Host Name [cp1]:
Ethernet IP Address [10.77.77.74]: 123.123.123.122
Ethernet Subnetmask [0.0.0.0]: 123.123.123.123
Gateway IP Address [0.0.0.0]: 123.123.123.124
IP address of remote CP is being changed...Done.
Committing configuration...Done.

swDir:admin> reboot
```

5. Type **reboot** to reboot the Brocade DCX.

Logging off the serial console port and disconnecting the serial cable

You can use the serial port to monitor error messages through the serial connection. If the serial port is no longer required, use the **logout** command to log out of the serial console, remove the serial cable, and replace the plug in the serial port.

Connecting an Ethernet cable and opening a Telnet session

NOTE
Connecting the CP blades to a private network/VLAN is recommended.

After using a serial connection to configure the IP addresses for the Brocade DCX, you can connect the active CP blade to the local area network (LAN).

By establishing an Ethernet connection, you can complete the Brocade DCX configuration using a serial session, Telnet, or management applications, such as Web Tools or DCFM.To create an Ethernet connection to the Brocade DCX, follow these steps.

1. Remove the shipping plug from the Ethernet port on the active CP blade.
2. Insert one end of an Ethernet cable into the Ethernet port.
3. Connect the other end to an Ethernet 10/100/1000 BaseT LAN.

   The Brocade DCX can be accessed through a remote connection using any of the management tools, such as Telnet, Web Tools, or DCFM.
4. To complete any additional Brocade DCX configuration procedures through a Telnet session, log in to the Brocade DCX by Telnet, using the **admin** login. The default password is *password*.

Customizing a switch name

The switch name of the Brocade DCX can be up to 30 characters long as of Fabric OS release 6.3.0; can include letters, numbers, and underscore characters; and must begin with a letter. Fabric OS releases earlier than 6.3.0 require switch names of 15 characters or less.

NOTE
Changing the name causes a domain address format RSCN to be issued.

1. Type **switchName** followed by the new name in double quotes.

```
swDir:admin> switchName "swModularSwitch5"
Committing configuration...
Done.
swModularSwitch5:admin>
```

2. Record the new name for reference.

Customizing a chassis name

For FOS 6.2.0 and later, the chassis name of the Brocade DCX can be up to 15 characters long; can include letters, numbers, and underscore characters; and must begin with a letter.

1. Type **chassisName** followed by the new name in double quotes.

```
switch:admin> chassisname
 "DCX_chassis_1"
Committing configuration...
Done.
```

2. Record the new name for reference.

Setting the domain ID

Each switch in the fabric must have a unique domain ID. The domain ID can be manually set through the **configure** command or can be automatically set. The default domain ID for the Brocade DCX is "1". Use the **fabricShow** command to view the already assigned domain IDs.

1. Enter **switchDisable** to disable the Brocade DCX.
2. Enter **configure** .
3. Enter *y* at the "Fabric parameters" prompt:

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

4. Enter a unique domain ID:

```
Domain: (1.239) [1] 3
```

5. Complete the remaining prompts or press Ctrl+D to accept the settings and exit.
6. Enter **switchEnable** to re-enable the Brocade DCX.

Setting the date and time

The date and time settings are used for logging events. Switch operation does not depend on the date and time; a switch with an incorrect date and time value still functions properly. However, because the date and time are used for logging, error detection, and troubleshooting, they should be set correctly.

Setting the date

To set the date, follow these steps.

1. If necessary, log on to the Brocade DCX by Telnet, using the **admin** account.

2. Enter the **date** command, using the following syntax:

```
date "mmddHHMMyy"
```

Where:

- mm is the month; valid values are 01 through 12.
- dd is the date; valid values are 01 through 31.
- HH is the hour; valid values are 00 through 23.
- MM is minutes; valid values are 00 through 59.
- yy is the year; valid values are 00 through 99 (values greater than 69 are interpreted as 1970 through 1999, and values less than 70 are interpreted as 2000-2069).

```
switch:admin> date
Fri Sep 26 17:01:48 UTC 2008
switch:admin> date "0926123008"
Fri Sep 26 12:30:00 UTC 2008
switch:admin>
```

Setting the time zone

To set the time zone, follow these steps.

1. If necessary, log on to the switch by Telnet, using the **admin** account.
2. Enter the **tsTimeZone** command as follows:

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

Use **timezone_fmt** to set the time zone by Country/City or by time zone ID, such as MST.

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

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

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

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

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

You are prompted to select a general location.

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

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

Synchronizing local time

To synchronize the local time of the principal or primary switch with that of an external NTP server, follow these steps.

1. If necessary, log on to the switch by Telnet, using the **admin** account.
2. Enter the **tsClockServer** command:

```
switch:admin> tsclockserver
 "<ntp1;ntp2>"
```

where *ntp1* is the IP address or DNS name of the first NTP server, which the switch must be able to access. The variable *ntp2* is the second NTP server and is optional. The operand "<ntp1;ntp2>" is optional; by default, this value is LOCL, which uses the local clock of the principal or primary switch as the clock server.

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

```
switch:admin> tsclockserver
LOCL
switch:admin> tsclockserver "132.163.135.131"

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

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

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

Verifying the PID mode and connecting to the fabric

Before connecting the Brocade DCX to the fabric, verify that the port identifier (PID) mode on the Brocade DCX matches the other switches in the fabric. This parameter must be identical for all switches in the fabric and is set using the **configure** command.

Software licenses

Depending on the vendor agreement, certain licenses are factory installed on the Brocade DCX. To determine which licenses are enabled, use the **licenseShow** command.

```
swDir:admin> licenseshow
AAbbccDDeeFFeeGG:
    Web license
    Zoning license
    Extended Fabric license
    Fabric Watch license
    Performance Monitor license
    Trunking license
    Security license
```

In this example, the license key is AAbbccDDeeFFeeGG. Keep a copy of the license key for reference.

The 64-bit chassis ID is required to obtain and activate licenses for the Brocade DCX. The chassis ID is available through the **licenseIdShow** command. The **licenseShow** and **licenseIdShow** commands must be entered on the active CP blade. Refer to the *Brocade Fabric OS Administration Guide* for more information.

Installing transceivers and attaching cables

Follow these steps to install SFPs, SFP+s, mSFPs (FC8-64 port card only), or XFPs (FC10-6 port card only) and cables to the Brocade DCX.

> NOTE
> mSFP transceivers are compatible only with the FC8-64 port blade. While they will fit in other blades, this configuration is unsupported and will generate an error.

The ports are color-coded to indicate which can be used in the same port group for trunking (trunking port groups can be up to eight ports). The ports and cables used in trunking groups must meet specific requirements. Refer to the *Brocade Fabric OS Administration Guide* for more information.

1. Position one of the optical transceivers so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.
2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

   Cables are keyed so that they can be inserted in only one way. If a cable does not slide in easily, ensure that it is correctly oriented.
3. Repeat the above steps for the remaining ports.
4. Organize the cables (see Managing cables on page 60).
5. Verify the Brocade DCX-4S and port status using the **switchShow** command.
6. Verify fabric connectivity using the **fabricShow** command.

Managing cables

> ATTENTION
> The minimum bend radius should be no smaller than 10x the cable radius.

Cables can be organized and managed in a variety of ways: for example, using cable channels on the port sides of the cabinet or patch panels to minimize cable management. With the horizontal orientation of the blades in the DCX-4S, a pair of vertical cable management finger assemblies have been provided to keep the cables from hanging down in front of other blades.

Following is a list of recommendations:

- Leave at least 1 m (3.28 ft) of slack for each port cable. This provides room to remove and replace the Brocade DCX, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.
- If ISL Trunking is in use, group the cables by trunking group. The ports are color-coded to indicate which ports can be used in the same ISL Trunking group: eight ports marked with solid black ovals alternate with eight ports marked with oval outlines.
- Generally, Velcro ® type cable restraints are recommended to avoid creating sharp bends in the cables.

- For easier maintenance, label the fiber optic cables and record the devices to which they are connected.
- Route the cables to the bottom of the DCX through the cable comb.
- Keep LEDs visible by routing port cables and other cables away from the LEDs.

For the procedure to install the ICL cables see Removal and replacement of the inter-chassis link (ICL) cables on page 115

NOTE
See "Cabling Best Practices" (available at http://www.brocade.com) for cable management guidelines.

Verifying correct operation and backing up the configuration

To verify correct operation and back up the Brocade DCX configuration, follow these steps.

1. Check the LEDs to verify that all components are functional. For information about LED patterns, see Monitoring System Components on page 63.
2. If necessary, log on to the switch by Telnet, using the **admin** account.
3. Verify the correct operation of the Brocade DCX by entering the **switchShow** command from the workstation. This command provides information about switch and port status.
4. Verify the correct operation of the Brocade DCX in the fabric by entering the **fabricShow** command from the workstation. This command provides general information about the fabric.
5. To back up the configuration, run the following two steps:
   a) Enter the **configupload -vf** command. This command uploads the Brocade DCX virtual fabric data.
   b) Enter the **configupload** command. This command uploads the Brocade DCX configuration.
6. You can run the following commands to see additional configuration information that you can copy to a file to save:
   - **configShow**
   - **ipaddrShow**
   - **licenseShow**
   - **switchShow**
7. Alternatively, you can save the configuration file to a Brocade USB device by using the **usbstorage** command.

NOTE
Passwords are not saved in the configuration file, and are not uploaded during a configuration upload.

Powering off the Brocade DCX

1. Shut down the Brocade DCX using the **sysShutdown** command.

```
switch::admin> sysshutdown
This command will shutdown the operating systems on your switch.
You are required to power-cycle the switch in order to restore operation.
Are you sure you want to shutdown the switch [y/n]?y
HA is disabled
Stopping blade 1
Shutting down the blade....
Stopping blade 2
Shutting down the blade....
Stopping blade 8
Shutting down the blade....
Broadcast message from root (pts/1) Tue Aug 23 14:23:06 2008...
The system is going down for system halt NOW !!
```

2. Power off the chassis by flipping the AC power switches on the power supplies to "0" (LEDs inside AC power switches should turn off). To maintain the ground connections, leave power cords connected to the power supplies and to the electrical outlets.

Monitoring System Components

Monitoring overview

The Brocade DCX is engineered for reliability and requires no routine operational steps or maintenance. This chapter provides information about determining the status of each component using LEDs and CLI commands. Refer to the *Brocade Web Tools Administration Guide* and the *Brocade Fabric OS Administration Guide for additional information.*

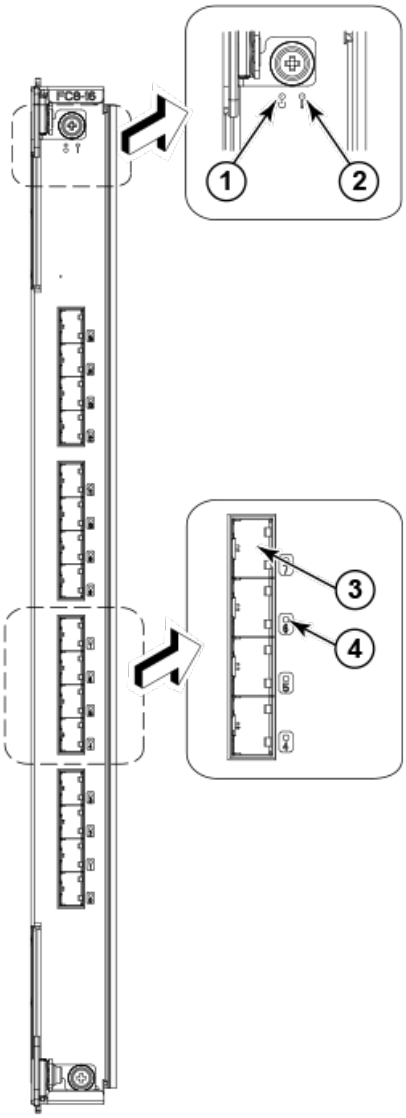
Determining the status of a port, application, or encryption blade

1. Check the LEDs on the blade.
   - Figure 16 illustrates the FC8-16 port blades.
   - Figure 17 illustrates the FC8-32 port blades.
   - Figure 18 illustrates the FC8-48 port blade.
   - Figure 19 illustrates the FC8-64 port blade.
   - Figure 20 illustrates the FS8-18 encryption blade.
   - Figure 21 illustrates the FX8-24 extension blade.
   - Figure 22 illustrates the FCOE10-24 FCOE blade.

   The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see the table after the illustrations.

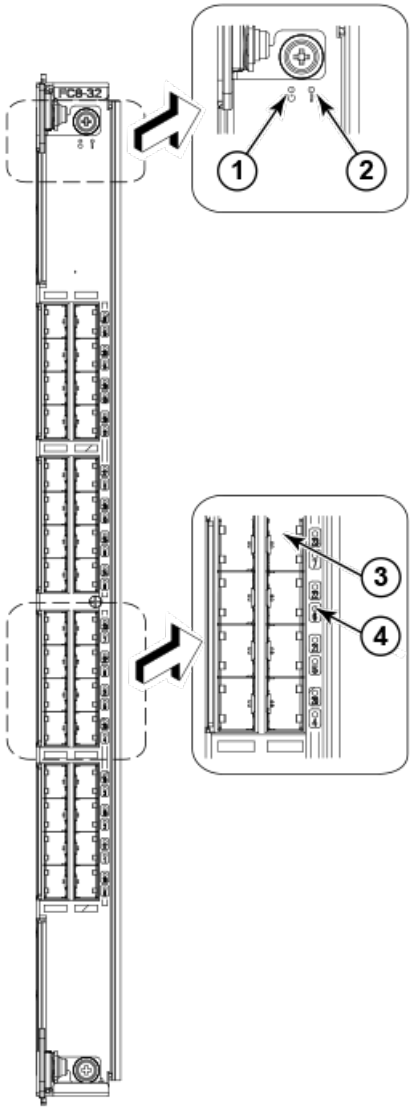
2. Check the blade status by entering **slotShow** .

FIGURE 16 FC8-16 Port blade



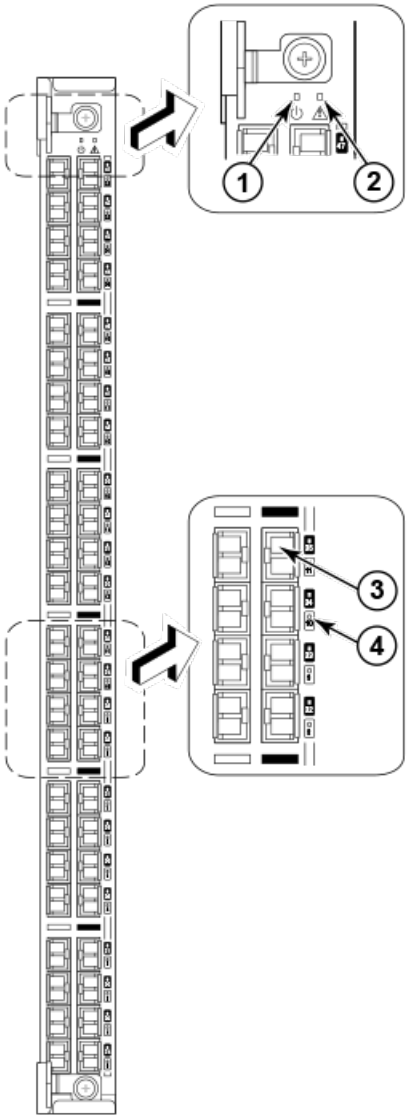
1. Power LED
2. Status LED
3. Fibre Channel port
4. Port Status LED

FIGURE 17 FC8-32 Port blade



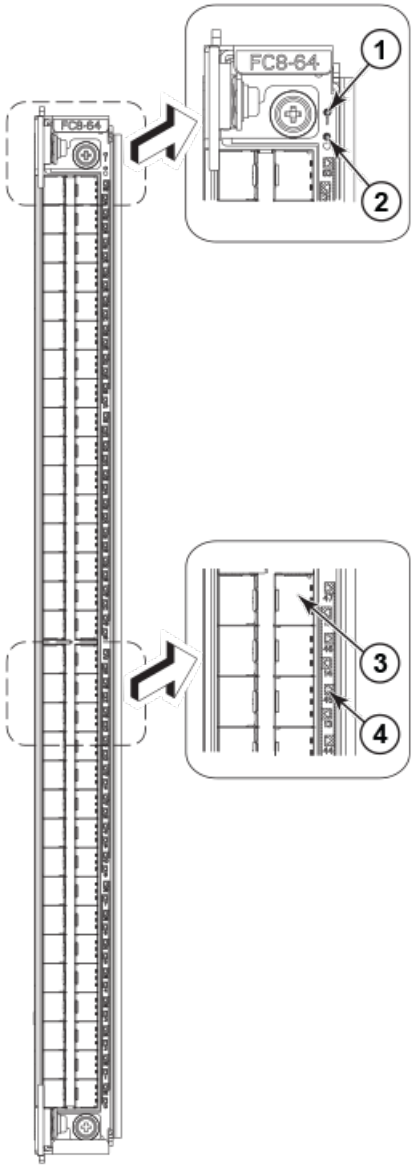
1. Power LED
2. Status LED
3. Fibre Channel port
4. Port Status LED

FIGURE 18 FC8-48 Port blade



1. Power LED
2. Status LED
3. Fibre Channel port
4. Port Status LED

FIGURE 19 FC8-64 Port blade

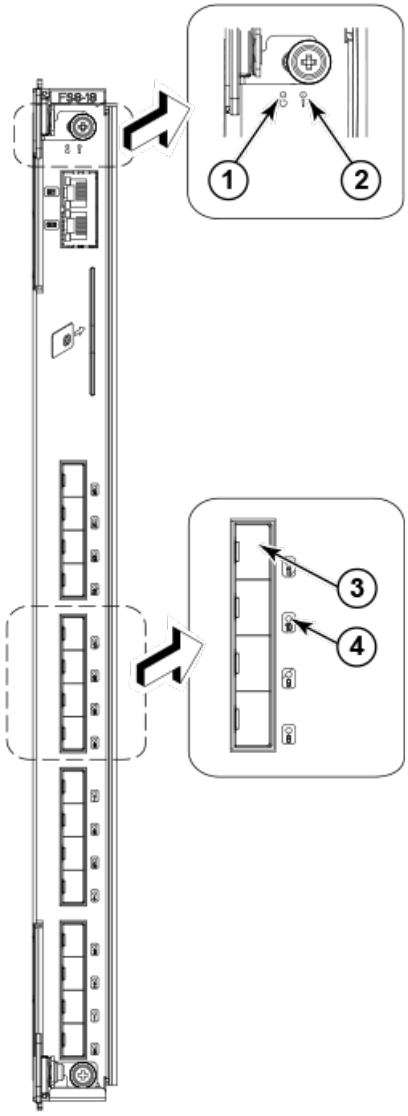


1. Status LED
2. Power LED
3. Fibre Channel port
4. Port Status LED

NOTE

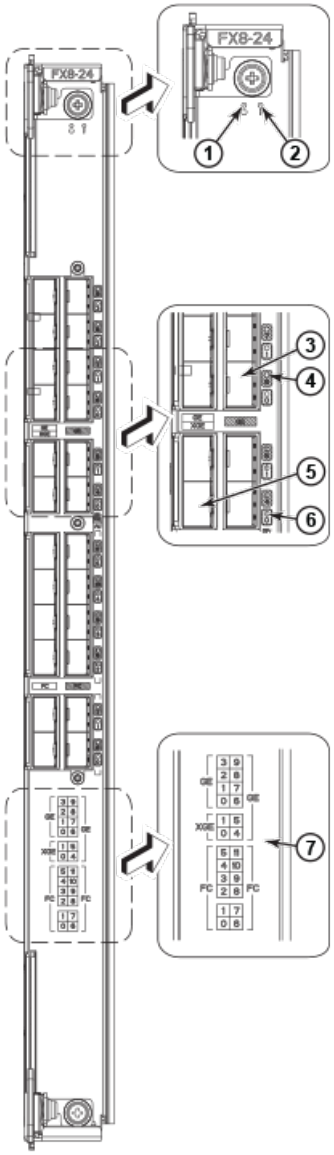
The FC8-64 port blade requires narrower OM-3 LC cables offered by major manufacturers like Corning, Molex, and Amphenol.

FIGURE 20 FS8-18 Encryption blade



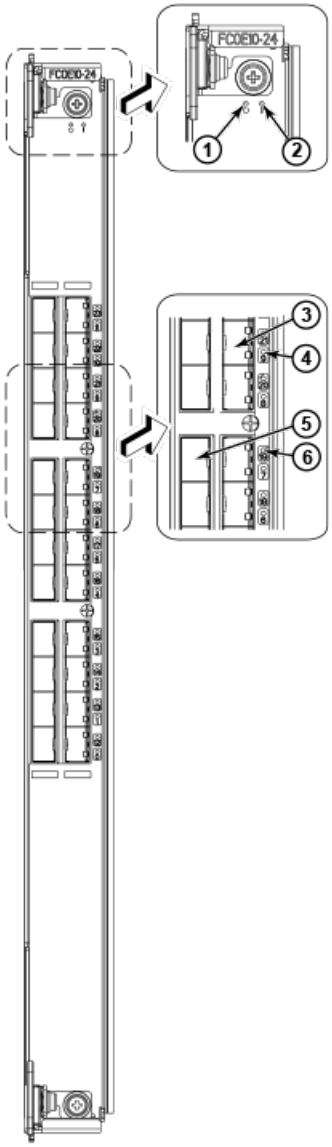
1. Power LED
2. Status LED
3. Fibre Channel port
4. Port Status LED

FIGURE 21 FX8-24 Extension blade



1. Power LED
2. Status LED
3. GbE port 6
4. GbE port 6 LED
5. 10GbE port 0
6. 10GbE port 0 LED
7. Port map

FIGURE 22 FCOE10-24 FCoE blade



1. Power LED10 GbE
2. Status LED
3. 10 GbE FCoE port 9
4. 10 GbE FCoE port 9 LED
5. 10 GbE FCoE port 19
6. 10 GbE FCoE port 19 LED

The following table describes the port and application blade LED patterns and the recommended actions for those patterns.

TABLE 6 Port and application blade LED descriptions

LED purpose	Color	Status	Recommended action
Power LED	Steady green	Blade is enabled.	No action required.

TABLE 6 Port and application blade LED descriptions (continued)

LED purpose	Color	Status	Recommended action
	No light (LED is off)	Blade is not powered on.	Ensure that the blade is firmly seated and either the thumbscrew is fully engaged or the slider is pushed up and the ejectors are fully engaged.
Status LED 	No light (LED is off)	Blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	Blade is faulty.	Ensure that the blade is firmly seated and check the status by entering the **slotShow** command. If LED remains amber, consult the Brocade DCX supplier.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.
FC Port Status	No light (LED is off)	Port has no incoming power, or there is no light or signal carrier detected.	Verify that the power LED is on, check the transceiver and cable.
		Polling is in progress.	Allow 60 seconds for polling to complete.
		Connected device is configured in an offline state.	Verify the status of the connected device.
	Steady green	Port is online (connected to an external device) but has no traffic.	No action required.
	Slow-flashing green (on 1 second, then off 1 second)	Port is online but segmented, indicating a loopback plug or cable or an incompatible switch.	Verify that the correct device is attached to the Brocade DCX.
	Fast-flashing green (on 1/4 second, then off 1/4 second)	Port is in internal loopback (diagnostic).	No action required.
	Flickering green	Port is online, with traffic flowing through port.	No action required.
	Steady amber	Port is receiving light or signal carrier, but it is not online yet.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Port is disabled due to diagnostic tests or **portDisable** or **portCfgPersistentEnable** command.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Transceiver or port is faulty.	Change the transceiver or reset the switch from the workstation.
	Alternating green/amber	Port is bypassed.	Reset the port from the workstation using the **portEnable** or **portCfgPersistentEnable** command.
	Green, amber, off (cycle is about 1 second)	Beaconing initiated on the local switch.	No action required. Beaconing used to locate/identify port.
	Amber, amber, pause (cycle is about 1 second)	Beaconing initiated on the HBA and reflected on the port.	No action required. Beaconing used to locate/identify port.

TABLE 6 Port and application blade LED descriptions (continued)

LED purpose	Color	Status	Recommended action
GbE Port Status (FX8-24) - both GbE and 10GbE ports.	No light (LED is off)	Port has no incoming power, or there is no light or signal carrier detected.	Verify that the power LED is on, check the transceiver and cable.
	Steady green	Port is online but has no traffic.	No action required.
	Slow-flashing green (on 1 second, then off 1 second)	Beacon. Used to identify specific ports.	No action required.
	Flickering green	Port is online, with traffic flowing through port.	No action required.
	Fast-flashing amber (on 1/4 second, then off 1/4 second)	Transceiver or port is faulty.	Change the transceiver or reset the switch from the workstation.
10GbE Port Status (FCOE10-24)	No light (LED is off)	Port is offline.	Verify that the power LED is on, check the transceiver and cable.
	Steady green	Port is online but has no traffic.	No action required.
	Flickering green	Port is online, with traffic flowing through port.	No action required.
	Steady amber	Port is receiving light but it is not online yet.	Reset the port by doing a **shutdown** and **no shutdown** sequence from a cmsh session.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	Port is disabled.	Enable the port by using the **no shutdown** command from a cmsh session.
	Fast-flashing amber (on 1/4 second, then off 1/4 second)	Transceiver or port is faulty.	Change the transceiver or reset the port by doing a **shutdown** and **no shutdown** sequence from a cmsh session.

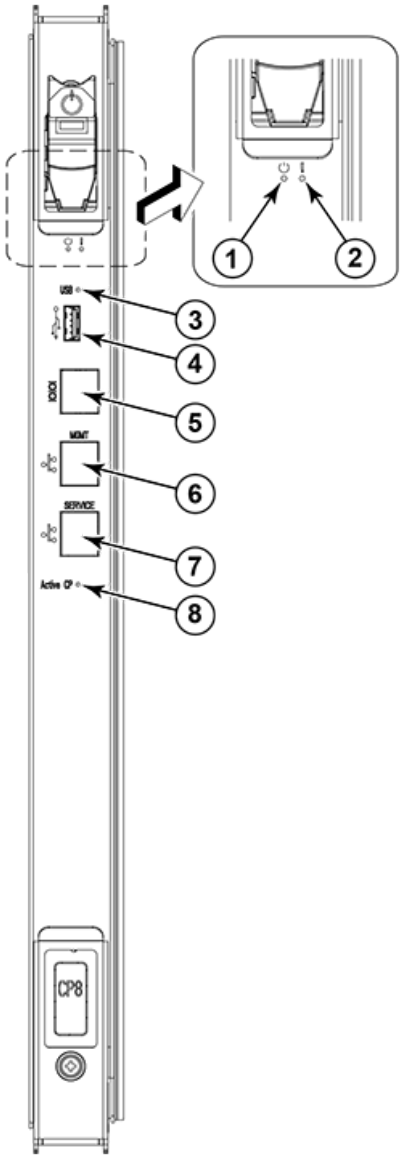
For more information on the CEE Management Shell (cmsh), see the *Fabric OS Command Reference Manual* or the *Converged Enhanced Ethernet Command Reference* .

Determining the status of a control processor blade (CP8)

1. Check the LED indicators on the control processor (CP) blade. The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see the next table.

2. Check the port blade status by entering **slotShow** and **haShow** .

FIGURE 23 Control processor blade (CP8)



1. Power LED
2. Status LED
3. USB LED
4. USB port
5. Console port (10101)
6. Ethernet port (MGM IP)
7. Ethernet port (SERVICE IP)
8. Active CP LED

The following table describes the CP blade LED patterns and the recommended actions for those patterns.

TABLE 7 CP blade LED descriptions

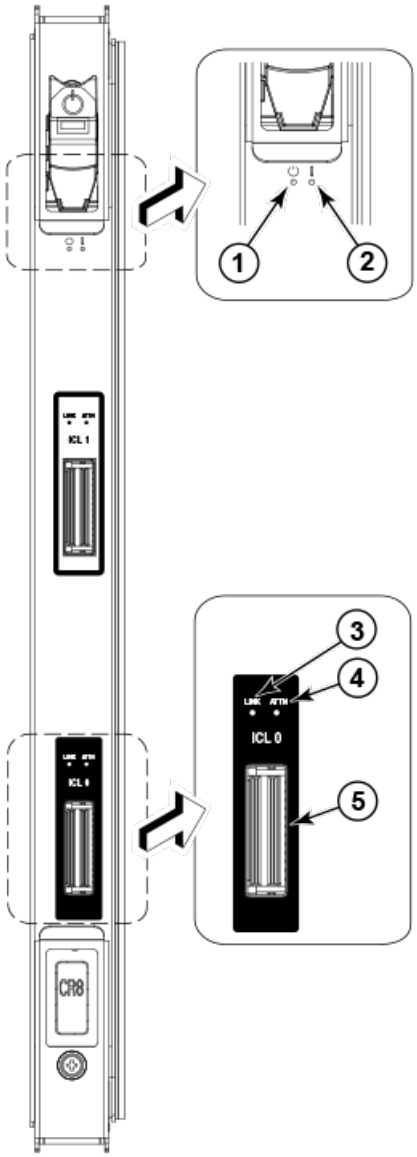
LED purpose	Color	Status	Recommended action
Power 	Steady green	CP blade is on.	No action required.
	No light (LED is off)	CP blade is not on.	Ensure that the blade is firmly seated and has power.
Status 	No light (LED is off)	CP blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	CP blade is faulty or the switch is still booting.	Ensure that the blade is firmly seated and the switch has completed booting. If LED remains amber, consult the Brocade DCX supplier.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	CP blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If the LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.
Ethernet Link Status	No light (LED is off)	Either an Ethernet link is not detected, or it does not have incoming power.	Ensure that the blade has power, the Ethernet cable is firmly seated, and the connected device is functioning.
	Flickering green/amber	Ethernet link is healthy and traffic is flowing through port.	No action required.
Ethernet Link Speed	No light (LED is off)	Ethernet link speed is 10 Mb/s or CP blade does not have incoming power.	Ensure that the CP has power. **NOTE:** To force a persistent Ethernet link speed, enter the **ifModeSet** command.
	Steady green	Ethernet link speed is 100/1000 Mb/s.	No action required.
USB Status	Lamp on	USB stick enabled.	No action required.
	Lamp off	USB stick not present or disabled.	No action required.
Active CP	Steady blue	Active CP blade.	No action required.
	No light (LED is off)	Standby CP blade.	No action required.

Determining the status of a core switch blade (CR8)

1. Check the LED indicators on the core switch (CR) blade. The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see the next table.

2. Check the core switch blade status by entering **slotShow** and **haShow** .

FIGURE 24 Core switch blade (CR8)



1. Power LED
2. Status LED
3. LINK LED
4. ATTN LED
5. ICL connector

The following table describes the core switch blade LED patterns and the recommended actions for those patterns.

TABLE 8 CR blade LED descriptions

LED purpose	Color	Status	Recommended action
Power 	Steady green	CP blade is on.	No action required.
	No light (LED is off)	CP blade is not on.	Ensure that the blade is firmly seated and has power.
Status 	No light (LED is off)	CP blade is either healthy or does not have power.	Verify that the power LED is on.
	Steady amber	CP blade is faulty or the switch is still booting.	Ensure that the blade is firmly seated and the switch has completed booting. Blade may not be compatible with other blades in the chassis. See the FCOE10-24 blade section for limitations. If the LED remains amber, consult the Brocade DCX supplier.
	Slow-flashing amber (on 2 seconds, then off 2 seconds)	CP blade is not seated correctly or is faulty.	Pull the blade out and reseat it. If the LED continues to flash, replace the blade.
	Fast-flashing amber (on 1/2 second, then off 1/2 second)	Environmental range exceeded.	Check for out-of-bounds environmental condition and correct it.
LINK LED	No light (LED is off)	No ICL or ICL cable present, but no connection.	Ensure that the ICL cable is correctly installed.
	Steady green	ICL connected.	No action required.
ATTN LED	No light (LED is off)	ICL operational.	No action required.
	Blinking amber	Attention required.	Ensure that the ICL cable is correctly installed.

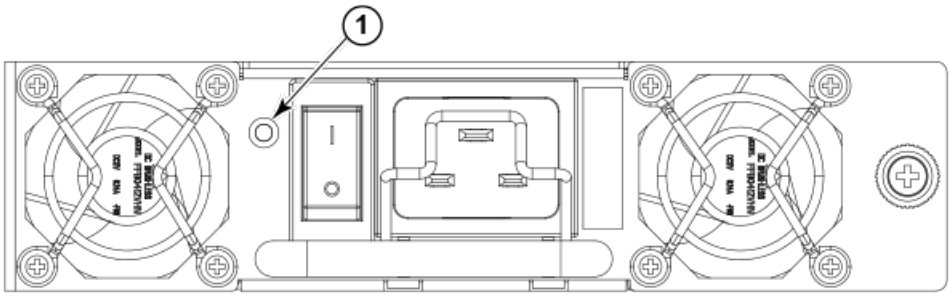
Determining the status of a power supply

1. Check the LED indicator on the power supply. The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see the next table.

2. Check the power supply status by entering **psShow** .

   The power supply status displays OK, Absent, or Faulty. If a power supply is absent or faulty, contact the Brocade DCX supplier to order replacement parts.

FIGURE 25 Power supply



1. Power LED

The following table describes the power supply LED patterns and the recommended actions for those patterns.

TABLE 9 Power supply LED descriptions

LED purpose	Color	Status	Recommended action
Power 	No light (LED is off)	Power supply does not have incoming power and is not providing power to the Brocade DCX.	Ensure that the power supply is firmly seated, the Brocade DCX has incoming power, both power cables are connected, and AC power switches are on.
	Steady green	Power supply has incoming power and is providing power to the Brocade DCX.	No action required.
	Flashing green	Power supply is about to fail.	Replace the power supply.

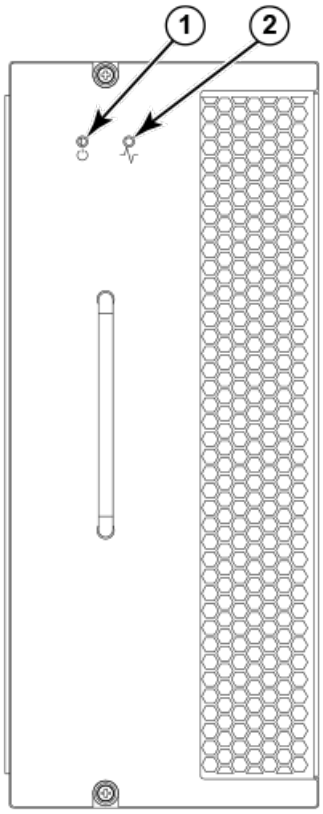
Determining the status of a blower assembly

1. Check the LED indicators on the blower assembly. The LED patterns may temporarily change during POST and other diagnostic tests. For information about how to interpret the LED patterns, see the next table.

2. Check the blower assembly status using the **fanShow** command.

   The status for each blower assembly displays OK, Absent, or Faulty. The RPM of each fan in the assembly is also provided. If a blower assembly is absent or faulty, contact the Brocade DCX supplier to order replacement parts.

FIGURE 26 Blower assembly



1. Power LED
2. Fault LED

The following table describes the power supply LED patterns and the recommended actions for those patterns.

TABLE 10 Blower assembly LED descriptions

LED purpose	Color	Status	Recommended action
Power	No light (LED is off)	Blower assembly does not have power.	Ensure that the blower assembly is firmly seated and has power.
	Steady green	Blower assembly has power.	No action required.
Fault	No light (LED is off)	Blower assembly is either healthy or does not have power.	Ensure that the blower assembly has power.
	Steady amber	Blower assembly has a failure (full or partial).	Replace the blower assembly.
	Slow-flashing amber(on 2 seconds, then off 2 seconds)	Blower assembly is not seated correctly or is faulty.	Pull the unit out and reseat it. If the LED continues to flash, replace the unit.

TABLE 10 Blower assembly LED descriptions (continued)

LED purpose	Color	Status	Recommended action
	Flashing amber(on 1/2 seconds, then off 3.5 seconds)	Fan is disabled.	Run the **fanEnable** command to enable the fan.
	Fast-flashing amber(on 1/2 seconds, then off 1/2 seconds)	Environmental range exceeded.	Check for out-of-bounds environmental condition, resolve any problems, and reseat the unit. If the LED continues to flash, replace the unit.

Determining the status of a WWN card

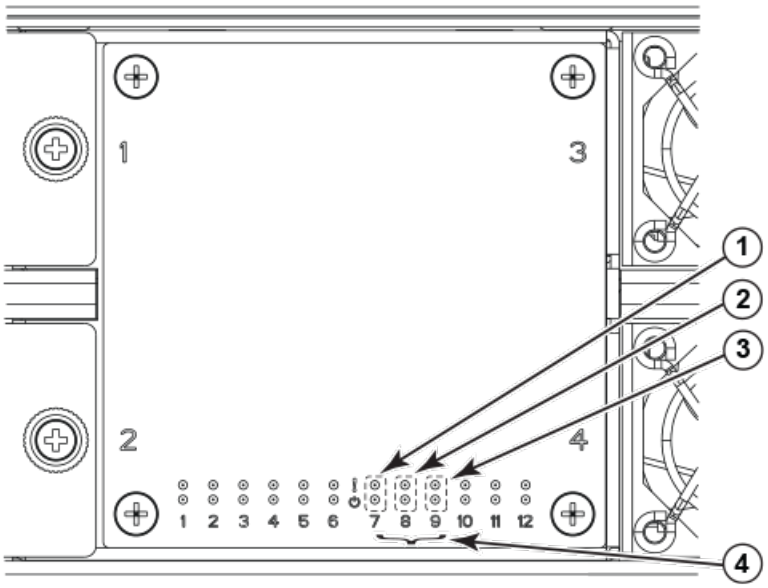
NOTE
The WWN bezel (logo plate) covers the WWN cards. The LEDs on the WWN cards are not visible unless the bezel is removed.

Enter the **chassisShow** command to display information about the WWN card. (WWN units correspond to information specific to the WWN card.) Error messages that may indicate problems with a WWN card are summarized in the following table.

TABLE 11 Messages that may indicate WWN card failure

Type of message	Sample error message
WWN unit fails its FRU header access.	`0x24c (fabos): Switch: switchname, error EM-I2C_TIMEOUT, 2, WWN 1 I2C timed out: state 0x4`
WWN unit is being faulted.	`0x24c (fabos): Switch: switchname, Critical EM-WWN_UNKNOWN, 1, Unknown WWN #2 is being faulted`
WWN unit is not present or is not accessible.	`0x24c (fabos): Switch: switchname, Error EM-WWN_ABSENT, 2, WWN #1 not present`
Writing to the FRU history log (**hilSetFruHistory**) has failed.	`0x24c (fabos): Switch: switchname, Error EM-HIL_FAIL, 2, HIL Error: hilSetFruHistory failed, rc=-3 for SLOT 3`

FIGURE 27 WWN bezel (logo plate)



1. CP blade Status (above) and Power (below) LEDs
2. CR blade Status (above) and Power (below) LEDs
3. Port blade Status (above) and Power (below) LEDs
4. Slot numbers

The following table describes the WWN card LED patterns and the recommended actions for those patterns.

TABLE 12 WWN bezel LED descriptions

LED purpose	Color	Status	Recommended action
Port blade/CP blade/CR blade Power	Steady green	Power is OK.	No action required.
Port blade/CP blade/CR bladeStatus	Steady amber	Blade is faulty.	Check the blade.
	No light (LED is OFF)	Blade is OK.	No action required.

NOTE: If a blade slot or power supply bay has a filler panel installed, the corresponding LEDs on the WWN blade do not light up.

Removal and Replacement Procedures

Introduction

NOTE

Read the safety notices before servicing.

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

The following sections contain FRU removal and replacement procedures (RRPs).

Removal and replacement of the chassis door

NOTE

The chassis door must be installed to ensure the Brocade DCX meets EMI and other regulatory certifications. Additionally, if ICL cables are not used, EMI plugs must be inserted in the ICL cable ports to meet certification standards.

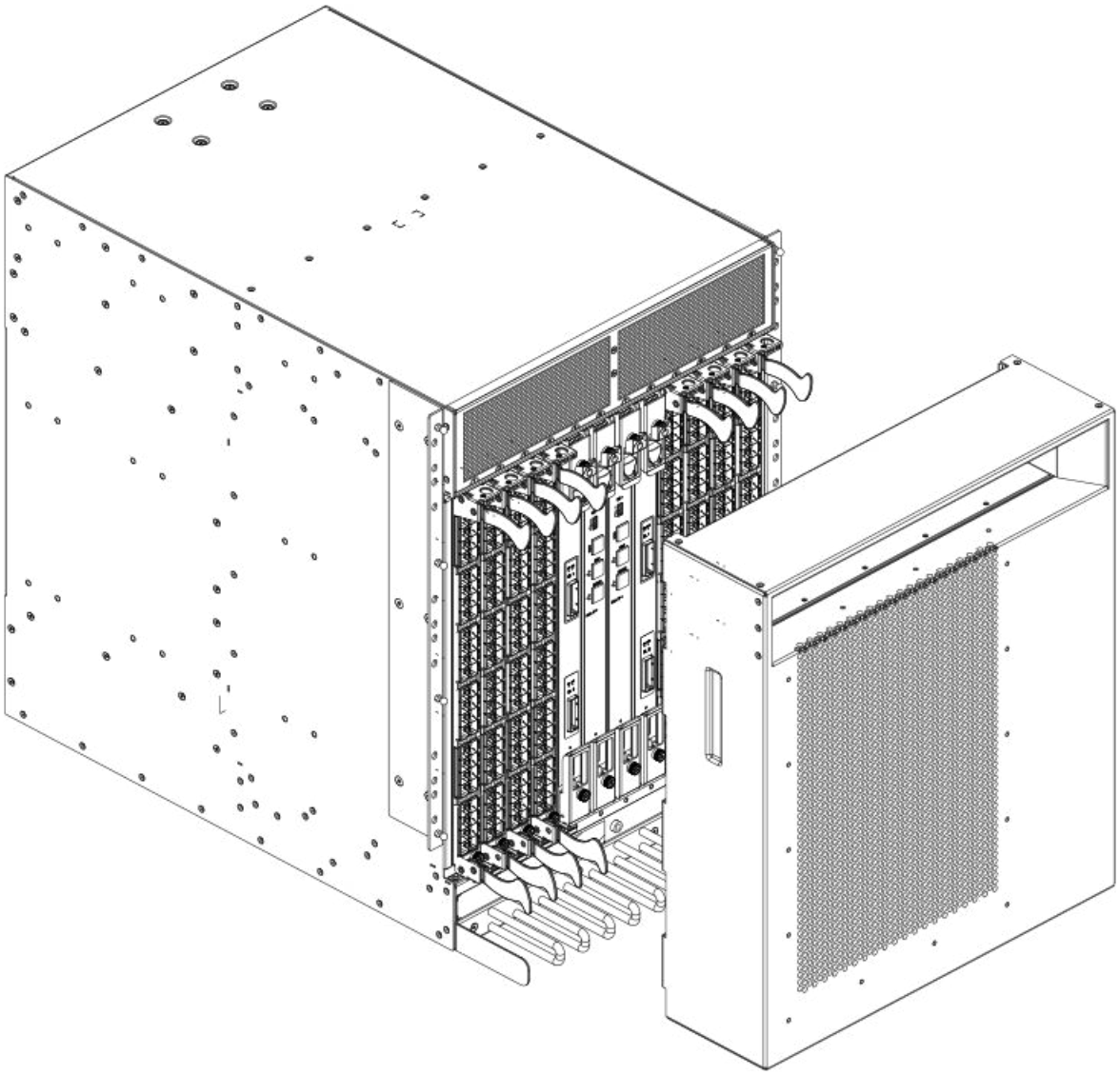
Time and items required

The replacement procedure for the chassis door takes less than 5 minutes.

Removing a chassis door

Support the door to prevent it from falling. Pull and remove the door.

FIGURE 28 Removal and replacement of the chassis door



Replacing a chassis door

1. Align the holes in the door with the pins in the chassis
2. Push the door into place.

Removal and replacement of the cable management comb

The Brocade DCX can continue to operate during the replacement of the cable management comb.

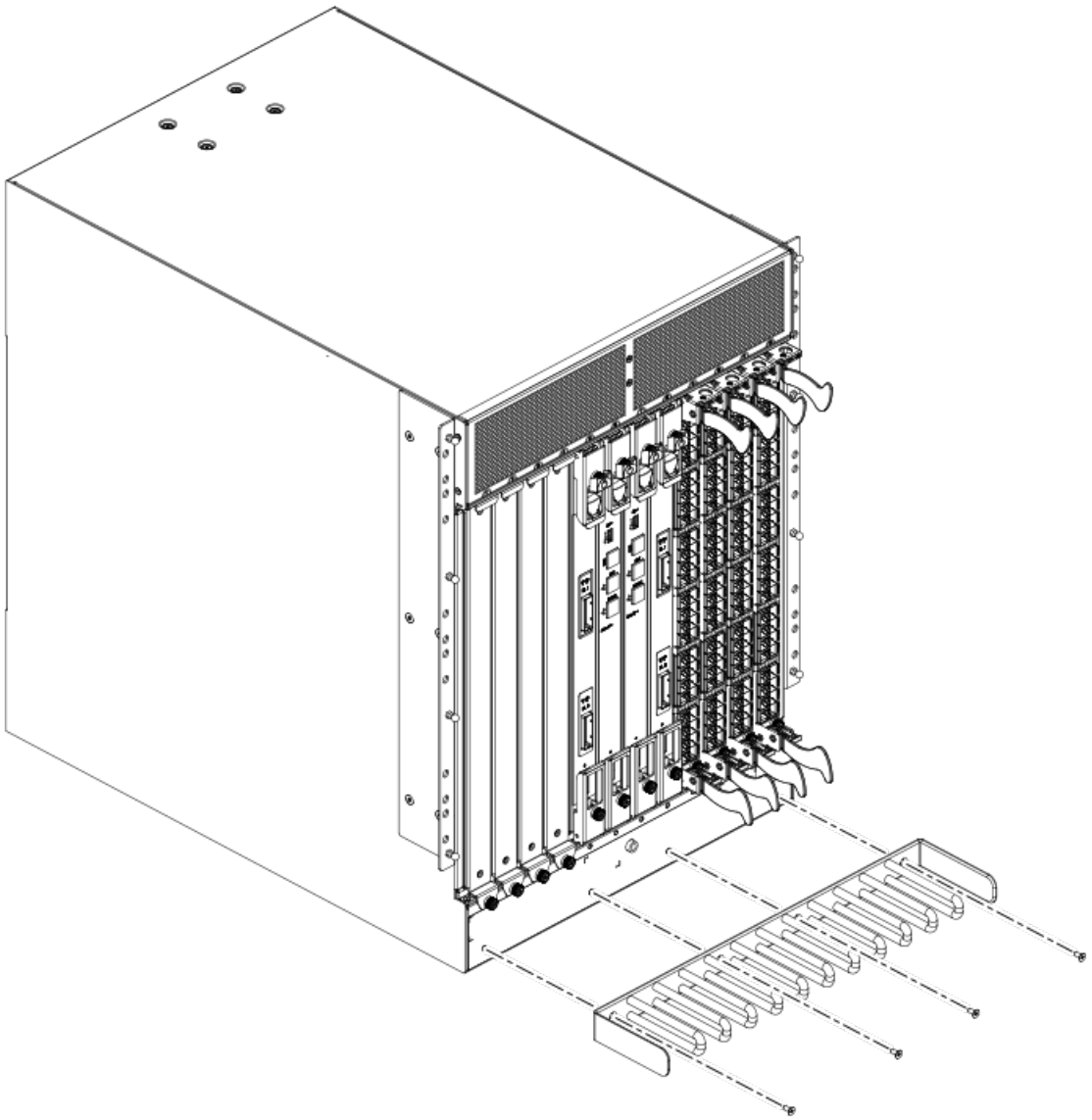
Time and items required

The replacement procedure for the cable management comb takes less than five minutes. A #1 Phillips screwdriver is required.

Removing a cable management comb

1. Remove the chassis door (Removal and replacement of the chassis door on page 83).
2. Remove the cables from the cable management comb and rearrange the cables around the comb.
3. Unscrew and save the four (4) screws holding the comb to the chassis. Support the comb to prevent it from falling.
4. Remove the cable management comb.

FIGURE 29 Removal and replacement of the cable management comb



Replacing a cable management comb

1. Position and tighten the four (4) screws to secure the cable management comb to the chassis.
2. Arrange the cables along the cable management comb.
3. Replace the chassis door (Removal and replacement of the chassis door on page 83).

Removal and replacement of the port, application, and encryption blades

This section describes how to remove and replace port, application, and encryption blades.

> ATTENTION
> A blade should be removed only when being replaced with another port, application, or encryption blade, or a filler panel (Removal and replacement of the blade filler panel on page 89). Any slot that is not occupied by a blade should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

Slots are numbered from 1 through 12, from left to right when facing the port side of the Brocade DCX. Port, application, and encryption blades can be installed in slots 1 through 4 and 9 through 12.

> ATTENTION
> The FCOE10-24 application blade is not compatible with the FC8-64 high-density port blade and the other application blades (FX8-24 and FS8-18) in the same chassis.

Blade	DCX	DCX-4S	DCX 8510-4	DCX 8510-8
FC8-32E port blade	No	No	Supported	Supported
FC8-48E port blade	No	No	Supported	Supported
FC8-64 port blade	Supported	Supported	Supported	Supported
FC16-32 port blade	No	No	Supported	Supported
FC16-48 port blade	No	No	Supported	Supported
FC16-64 port blade	No	No	Supported	Supported
FCOE10-24 application blade	Supported	Supported	No	Supported (only in slot 1)
	Note: Not supported in the same chassis with FC8-48E, FC8-64, FC16-48, FC16-64, FS8-18, or FX8-24 blades.			
FS8-18 encryption blade	Supported	Supported	Supported	Supported
FX8-24 extension blade	Supported	Supported	Supported	Supported

Time and items required

The replacement procedure for each blade takes less than 10 minutes. The following items are required for the blade and filler panel replacement:

- Electrostatic discharge (ESD) grounding strap
- Workstation computer
- Replacement blade or filler panel
- #2 Phillips screwdriver

- Small form-factor pluggable (SFP, SFP+, or mSFP (FC8-64 only)) or extended form-factor pluggable (XFP) (FC10-6 blade only) transceivers (as needed)
- Optical cables (as needed)

Removing a blade

ATTENTION
Follow ESD precautions.

NOTE
The FC8-16, FC8-32, and FC8-48 blades are compatible with the Brocade DCX, Brocade DCX-4S, and the Brocade 48000. The FC8-64 port blade, the FS8-18 encryption blade, and the FX8-24 and FCOE10-24 blades are compatible only with the Brocade DCX and DCX-4S.

1. Remove the chassis door (Removal and replacement of the chassis door on page 83).
2. Check the power LED, status LED, and port status LED to identify any possible problems. A failed blade can be identified by inspecting the LEDs on the front panel of each blade. See Monitoring System Components on page 63 for LED locations.
3. Establish a Telnet or console session.

   Before replacing a blade, establish a Telnet or console connection to determine a failure and verify operation after replacement. Use the **slotShow** command to view the status of blades.
4. Check for adequate cable slack. Ensure there is plenty of cable slack to remove a blade without cable obstruction.
5. Ensure that the part number on the unit being replaced matches the replacement part number. The **chassisShow** command displays information about the blades, including part numbers (*xx-xxxxxxx-xx*), serial numbers, and additional status.
6. Ensure that traffic is not flowing through the blade (port status LED should be off) prior to disconnecting cables.

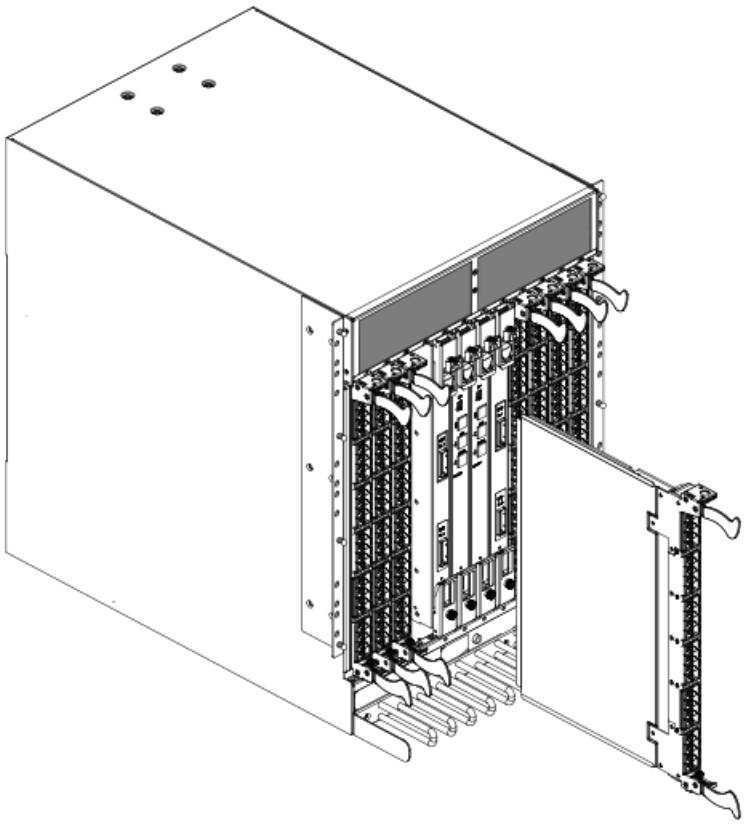
   NOTE
   Before removing any cables from a blade, note the cable order (identify each cable by its physical port). It is a good practice to keep a table of cable to port mapping. See Cable routing table on page 135 at the end of this chapter for a blank sample table.

   NOTE
   If multiple blades are being replaced, replace one blade at a time.
7. Disconnect all cables and the SFP, SFP+, or XFP transceivers from the blade. For mSFP transceivers(FC8-64 only), it is recommended that you use the pull tab to remove the transceiver from the blade before removing the cable from the transceiver.
8. If removing an FX8-24 extension blade, perform the following steps:
   a) Delete all fciptunnel configurations via the **portcfg fciptunnel slot / vePort** command.
   b) Delete all IP Routes defined on the blade to be removed via the **portcfg iproute** command.
   c) Delete all IP interfaces (IPIFs) defined on the blade via the **portcfg ipif slot/geX | xgeX** command.
   d) If logical switches are used on the switch, move all FX8-24 ports back to the default logical switch.

      NOTE
      If you are removing the FX8-24 blade to install in a different slot, you must remove configuration using the preceding steps, then reconfigure the blade in the new slot. If you move the blade without performing these steps and the blade faults, you must move the blade to the original slot and remove configuration.

9. Unscrew the two thumbscrews from the top and bottom ejectors on the blade using the Phillips screwdriver. Unscrew the top thumbscrew until it pops out. This initiates a hot-swap request.
10. Wait for the power LED to turn off in response to the hot-swap request before removing the blade.
11. Open the ejectors by pulling them toward the center of the blade face. Pull the blade out of the chassis using the ejectors.
12. If the blade is not being replaced by another blade, install a filler panel (Removal and replacement of the blade filler panel on page 89).

FIGURE 30 Removal and replacement of the port, application, and encryption blades (FC8-48 port blade shown)



Replacing a blade

ATTENTION
Follow ESD precautions.

1. Orient the blade so that the ports are at the front of the chassis and the flat side of the blade is on the left.
2. Adjust the ejectors to the open position, align the flat side of the blade inside the upper and lower rail guides in the slot, and slide the blade into the slot until it is firmly seated.
3. Adjust the ejectors to the closed position by pulling them away from the center of the blade.
4. Tighten the upper and lower thumbscrews using the Phillips screwdriver.
5. Verify that the power LED on the port blade is displaying a steady green light. If it does not turn on, ensure that the blade is firmly seated.

6. Install the SFP or SFP+ transceivers and cables in the blade. For mSFP (**FC8-64** only) transceivers, it is recommended that you install the cables in the transceivers before installing the transceivers in the blade.
7. Group and route the cables through the cable management comb.
8. Replace the chassis door (Removal and replacement of the chassis door on page 83).

Removal and replacement of the blade filler panel

This section describes how to remove and replace blade filler panels.

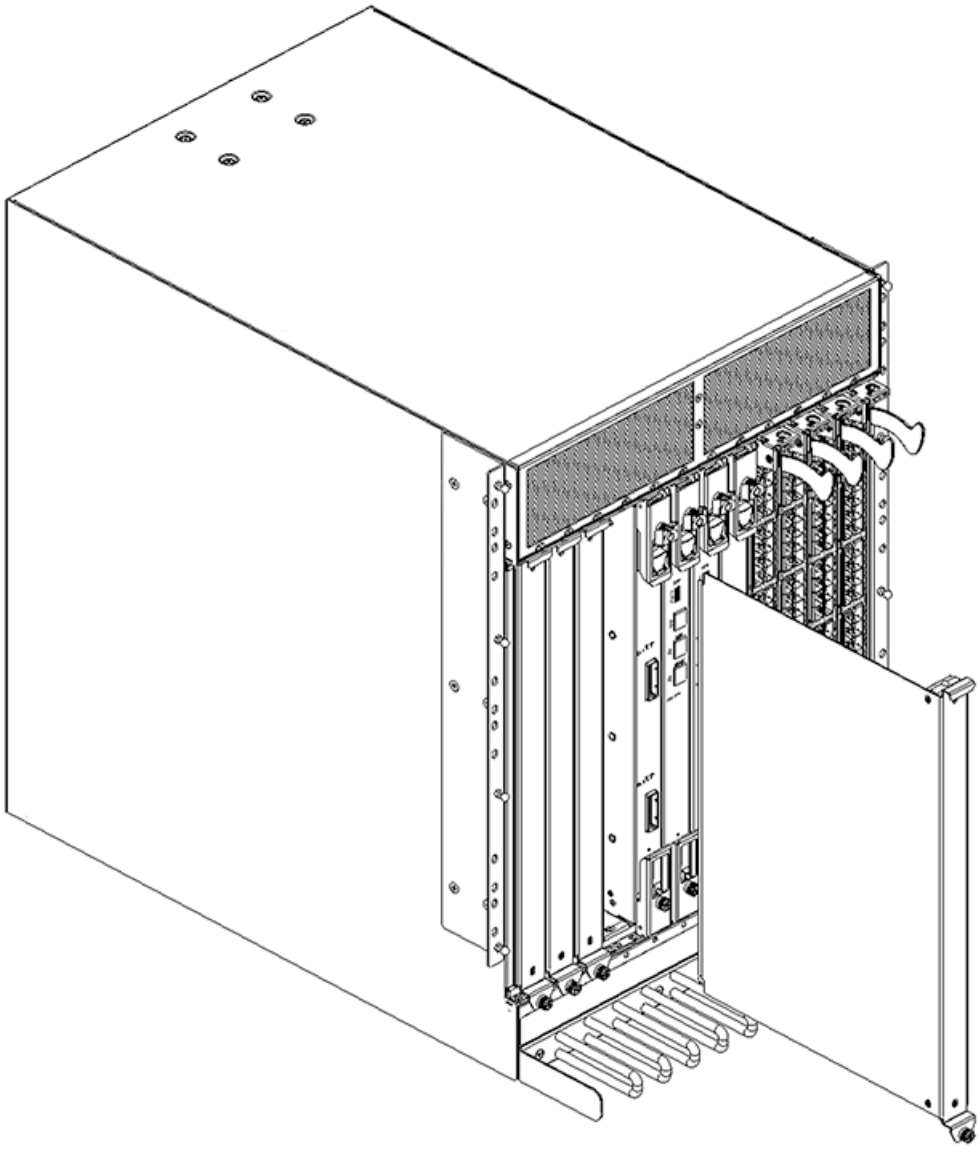
Removing a filler panel

ATTENTION
A filler panel should be removed only when being replaced with a port, application, or encryption blade, or another filler panel. Any slot that is not occupied by a blade should be occupied by a filler panel to ensure correct cooling of the chassis and protection from dust.

1. Remove the chassis door (Removal and replacement of the chassis door on page 83).
2. Unscrew the thumbscrew at the bottom of the panel using the Phillips screwdriver.

3. Pull the filler panel out of the chassis.

FIGURE 31 Removal and replacement of the blade filler panel



Replacing a filler panel

1. Orient the filler panel.
2. Slide the filler panel into the slot until it is firmly seated.
3. Tighten the thumbscrew at the bottom of the panel.
4. Replace the chassis door (Removal and replacement of the chassis door on page 83).

Removal and replacement of the control processor blade (CP8)

This section describes how to remove and replace a control processor (CP8) blade. Each Brocade DCX has two CP8 blades located in slot 6 and slot 7.

NOTE
If the new CP blade does not have the same firmware as the active CP blade, the new blade must be upgraded to the same firmware version. Refer to the *Brocade Fabric OS Administration Guide* for information.

Time and items required

The replacement procedure for the CP blade takes approximately 30 minutes. The following items are required for the CP blade replacement:

- ESD grounding strap
- Workstation computer
- Serial cable
- IP address of an FTP server for backing up the Brocade DCX configuration
- #2 Phillips screwdriver
- Replacement Brocade DCX CP blade (CP8)

Verifying the necessity of replacement

Confirm that you need to replace the CP blade. The following events might indicate that a CP blade is faulty:

- The status LED on the CP blade is lit amber, or the power LED is not lit.
- The CP blade does not respond to Fabric OS commands, or the serial console is not available.
- The **slotShow** command does not show that the CP blade is enabled.
- The **haShow** command indicates an error.
- The clock is inaccurate, or the CP blade does not boot up or shut down normally.
- Any of the following messages display in the error log:
  - "Slot unknown" message relating to a CP slot
  - CP blade errors or I2C timeouts
  - FRU: FRU_FAULTY messages for a CP blade
  - Configuration loader messages or "Sys PCI config" messages
  - Generic system driver messages ("FABSYS")
  - Platform system driver messages ("Platform")
  - EM messages that indicate a problem with a CP blade
  - Function fail messages for the CP master

For more information about error messages, refer to the *Brocade Fabric OS Message Reference*.

Recording critical Brocade DCX information

Back up the Brocade DCX configuration before you replace a CP blade. Refer to the *Brocade Fabric OS Administration Guide* for backup information.

1. Connect to the Brocade DCX and log in as **admin**, using either a Telnet or a serial console connection.
2. Enter **haShow** to determine which CP blade is active.

```
switch:admin> haShow
Local CP (Slot 7, CP1) : Active
Remote CP (Slot 6, CP0) : Standby, Healthy
HA Enabled, Heartbeat Up, HA State Synchronized
```

3. Enter all remaining commands from the serial console for the active CP blade, unless otherwise indicated. For more information about commands, refer to the *Brocade Fabric OS Command Reference*.
4. If one CP blade is faulted, confirm that the other CP blade is now the active CP blade and log in to the active CP blade and skip to Step 7.
5. If both CP blades are healthy and you want to replace the standby CP blade, log in to the active CP blade and skip to Step 7.
6. If both CP blades are healthy and you want to replace the active CP blade, log in to the active CP blade and run the following steps:
   a) Run the **hafailover** command to make the standby CP blade the active blade. The currently active CP blade becomes the standby blade. Wait until the status LED on the currently active CP blade is no longer lit.
   b) Confirm the completion of the failover by running the **hashow** command.
   c) Log in to the new active CP blade.
   d) Run the **firmwareshow** command to confirm the firmware version of the active CP blade.
   e) Run the **hadisable** command to prevent failover or communication between the CP blades during the replacement.
   f) Continue with Step 7.
7. Enter **firmwareShow** to note the firmware version of the active CP blade.
8. Enter **haDisable** from the active CP blade to prevent failover or communication between the CP blades during the replacement.
9. Logged in to the active CP, run the following two steps to upload the Brocade DCX configuration to a specified FTP server. Enter information at the prompts.
   a) Enter the **configupload -vf** command. This command uploads the virtual fabric data.
   b) Enter the **configupload -all** command. This command uploads the chassis and switch configuration for all logical switches. .
   c) Enter **configupload --map** to upload port-to-area mapping information.
      With Fabric OS 7.4.0, you need to upload the configuration with **-map** option in a FICON-enabled DCX 8510 chassis if port-bound addressing is used.

Power-up procedure

Use the procedures in this section to remove and replace a single control processor (CP) blade while chassis power is on. To replace both CP blades, refer to the power-down replacement procedures.

Removing a control processor blade (CP8)

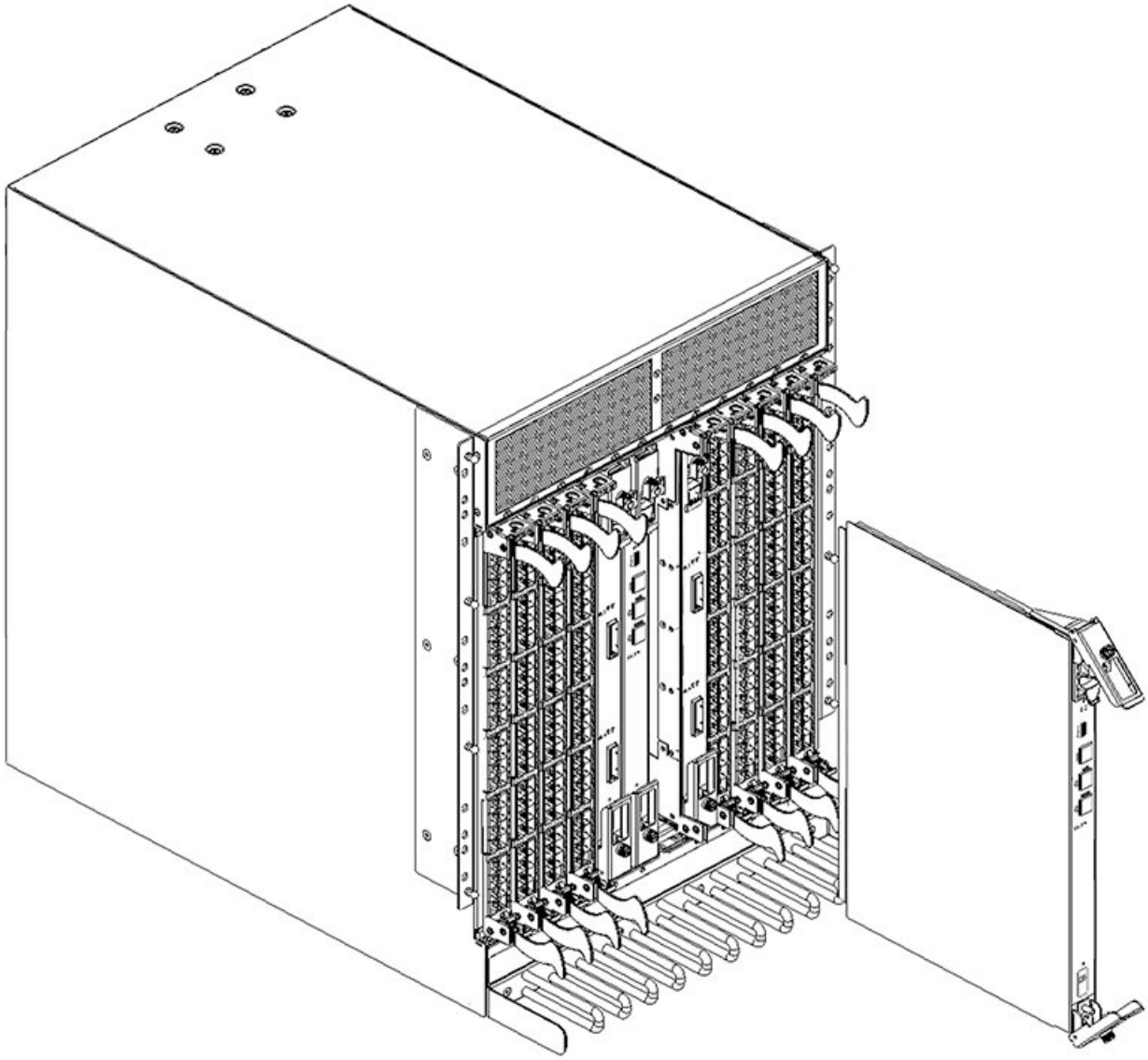
The Brocade DCX continues to operate while a CP blade is being replaced if the redundant CP blade is active and a failover does not occur. You can prevent failover by entering the **haDisable** command.

ATTENTION
Follow ESD precautions.

NOTE
The CP8 blade is compatible only with the Brocade DCX and DCX-4S.

1. Remove the chassis door (Removal and replacement of the chassis door on page 83).
2. Power off the blade you are replacing by sliding the slider switch in the top ejector down to the off position.
3. Disconnect all cables from the CP blade you are replacing.
4. Unscrew the thumbscrews from both ejectors using the Phillips screwdriver.
5. Open both ejectors simultaneously to approximately 45 degrees and pull the CP blade out of the chassis.

FIGURE 32 Removal and replacement of the control processor blade (CP8)



Replacing a control processor blade (CP8)

ATTENTION
Follow ESD precautions.

1. Open the ejector handles to approximately 45 degrees. Orient the CP blade so that the handles are toward you and the flat metal side is on your left.
2. Align the flat metal side of the CP blade inside the lower and upper blade guides in the slot. Slide the CP blade into the slot until it is firmly seated.
3. Tighten the thumbscrews inside each handle using the Phillips screwdriver.
4. Turn the CP blade on by sliding the ON/OFF switch in the top handle up, to cover the thumbscrew.
5. Verify that the power LED is green. If not, ensure that the CP blade has power and is firmly seated and that the ejectors are in the locked position.
6. Connect the cables to the new CP blade.
7. Remain logged in to the active CP and continue to Verifying operation of the new CP blade on page 95

Power-down procedure

Use the following procedure to power down the chassis and replace both CP blades. You can replace a single CP blade using the power-up procedures.

1. Remove the chassis door.
2. If you haven't already done so, enter **configupload - all**, specifying a file name for saving configuration data.
   This saves all system configuration data including chassis and switch configuration for all logical switches to the file name specified. For more information, refer to the *Brocade Fabric OS Command Reference*.
3. If you haven't already done so, enter **configupload -vf**, specifying a file name for saving configuration data.
   This saves the backbone virtual fabric data to the file name specified. For more information, refer to the *Brocade Fabric OS Command Reference*.
4. If you haven't already done so, enter **configupload -map**, specifying a folder name.
   This command saves the port-to-area addressing mode configuration files to the folder specified. With Fabric OS 7.4.0, you need to upload the configuration with **-map** option in a FICON-enabled DCX 8510 chassis if port-bound addressing is used. For more information, refer to the *Brocade Fabric OS Command Reference*.
5. Power down the chassis.
6. Remove CP blades using the following steps:
   a) Disconnect all cables from the blades.
   b) Unscrew the thumbscrew from both ejectors for a blade using the Phillips screwdriver.
   c) Lever open both ejector handles simultaneously to approximately 45 degrees and pull the CP blade out of the chassis.
7. Replace the blades using the following steps:
   a) Open the ejector handles to approximately 45 degrees. Orient the CP blade so that the handles are toward you.
   b) Align the flat metal side of the CP blade inside the blade guides in the slot. Slide the CP blade into the slot until it is firmly seated.
   c) Tighten the thumbscrew inside each handle using the Phillips screwdriver.
   d) Turn the CP blade on by sliding the ON/OFF switch in the left handle to the left to cover the thumbscrew.
8. Power up the chassis.

9. Verify that each blade's power LED is green. If not, ensure that the CP blade has power and is firmly seated and that the ejectors are in the locked position.
10. Connect the cables to the new CP blade.
11. Enter **chassisDisable**.
12. Enter **configDownload -vf** to download backbone virtual fabric data to the local system.
    The chassis reboots and partitions are restored.
13. Enter **chassisDisable**.
14. Enter **configDownload -map** to download port-to-area addressing mode configuration files to the local system.
15. Enter **chassisReboot -m**.
    The system recovers.
16. Enter **chassisDisable**.
17. Enter **configDownload -all** to download system configuration data, including chassis and switch configuration for all logical switches, to the local system.
    All the licenses, configurations, and FCIP tunnels are restored.
18. Enter **reboot**.
    The chassis becomes fully functional with the new CP blades.

Verifying operation of the new CP blade

To verify that boot and POST are complete on the new CP blade and that the CP blade has achieved failover redundancy, perform the following steps.

1. Type **slotShow**. The command output shows the new CP blade as "enabled."
2. Log into each CP blade and enter the **haShow** command to display the CP status. Verify the CP state, status, health, and that the HA state is synchronized. Remedy any issues before proceeding. For more information on **haShow** output, refer to the *Brocade Fabric OS Command Reference*.
3. Determine the version by typing **firmwareShow** .
4. If the firmware versions for both CP blades are the same, skip to Downloading firmware from an FTP server on page 96

   If the firmware version on the replacement blade does not match that on the active CP blade, the following warning message appears with the results of the **firmwareshow** command:

   ```
   WARNING: The local CP and remote CP have different versions
   of firmware, please retry firmwaredownload command.
   ```
5. Bring the replacement blade firmware to the same firmware level as the active blade using one of the following procedures:
   - Run the **firmwaresync** command on the active CP blade to copy all firmware from the active CP blade to the standby CP blade.

     NOTE
     Using this command requires that existing telnet, secure telnet or SSH sessions to the standby CP blade to be restarted.

   - Run the **firmwareDownload -s** command on the replacement blade to bring it up to the proper level.

6. Perform one of the following tasks to download firmware:
   - If you are using an FTP server to download the firmware, skip to Downloading firmware from an FTP server on page 96.
   - If you are using a USB device to download the firmware, skip to Downloading firmware from a USB device on page 96. If the firmware on the standby CP blade is more than one level down from the level on the active CP blade, you must have formatted USB devices for each of the versions you will need to upgrade.

   For details on supported upgrade paths and steps to upgrade through multiple versions of Fabric OS, refer to the *Fabric OS Release Notes*, and the *Fabric OS Upgrade Guide*.

Downloading firmware from an FTP server

1. Log out of the active CP blade and log in to the standby CP blade.
2. Type **firmwareDownload -s** to download the firmware to the standby CP blade. The **-s** option also disables the autoreboot, so you will have to manually issue a reboot after the download finishes to initiate firmwarecommit. Enter all requested information (use default values).
3. Type **firmwareDownloadStatus** to verify that the firmware has been updated.
4. Ensure that you are still logged in to the standby CP blade (the blade for which you just changed the firmware level) and type **reboot** . The reboot of the standby CP will initiate a firmwarecommit to the secondary partition and log you out.
5. Log back in to the standby CP blade and type **firmwaredDownloadStatus** on the standby CP blade to validate a successful commit. This may take 10 minutes.
6. Log out of the standby CP blade and log in to the active CP blade.
7. Type **haEnable** to re-enable HA on the active CP blade.

   NOTE
   For Fabric OS 6.3.0 and later, **haEnable** will cause the standby CP blade to reboot. Wait until the power cycles and the POST completes before moving to the next step.
8. Type **haShow** and verify that the command output includes "HA Enabled Heartbeat Up". If not, re-enter the command until you have verified that redundancy is achieved.
9. Type **version** or **firmwareShow** to verify that the firmware version has been updated.
10. Pack the faulty CP blade in the packaging provided with the new CP blade, and contact the Brocade DCX supplier to determine the return procedure.
11. Replace the chassis door (Removal and replacement of the chassis door on page 83).

Downloading firmware from a USB device

The folder structure on the USB device must be as follows in order to allow the device to be enabled:

- brocade>
  - config
  - firmware
  - firmwareKey
  - support

The firmware folder contains the folder for the specific release you are installing.

1. Insert the USB device into the active CP blade.
2. Attach a serial cable from the PC to the active CP blade.
3. Log in to the active CP blade and type **usbStorage - e** to enable the USB device.

4. Remove the serial cable from the active CP blade and attach it to the standby CP blade.
5. Type **firmwareDownload -s -U v***X.X.X* (where *X.X.X* is the firmware version you are downloading) to download the firmware to the standby CP blade.

   The **-s** option also disables the autoreboot, so you must manually issue a reboot after the download finishes to initiate firmwarecommit. Enter all requested information (use default values).

   The **-U** option indicates that the download should come from the USB device. If you do not use this option, you are prompted with *Download from USB [No]:* Type **Y** to download from the USB device.
6. When the download process finishes, type **firmwareDownloadStatus** to verify that the firmware has been updated.
7. Ensure that you are still logged in to the standby CP blade (the blade for which you just changed the firmware level) and type **reboot**. The reboot of the standby CP will initiate a firmwarecommit to the secondary partition and log you out.
8. Log back in to the standby CP blade and type **firmwareDownloadStatus** on the standby CP blade to validate a successful commit. This may take 10 minutes.
9. Log out of the standby CP blade and log in to the active CP blade.
10. Type **haEnable** to re-enable HA on the active CP blade.
11. Type **haShow** and verify that the command output includes "HA enabled, Heartbeat Up, HA State synchronized". If not, re-enter the command until you have verified that redundancy is achieved.
12. Type **firmwareShow** to verify that the firmware version has been updated and that the versions are the same on the two CP blades.
13. Pack the faulty CP blade in the packaging provided with the new CP blade, and contact the switch supplier to determine the return procedure.
14. Replace the chassis door (Removal and replacement of the chassis door on page 83).

Removal and replacement of the core switch blade (CR8)

This section describes how to remove and replace a core switch blade (CR8). The Brocade DCX has two core switch blades: one in slot 5 and one in slot 8. Note that the blade shown in the removal illustration (Removing a core switch blade (CR8) on page 98) is shown with EMI plugs installed.

Time and items required

The replacement procedure for the core switch blade takes approximately 30 minutes. The following items are required for the core switch blade replacement:

- ESD grounding strap
- #2 Phillips screwdriver
- Replacement Brocade DCX CR8 core switch blade

Verifying the necessity of replacement

Confirm that you need to replace the core switch blade. The following events might indicate that a core switch blade is faulty:

- The status LED on the core switch blade is lit amber, or the power LED is not lit.
- The **slotShow** command does not show that the core switch blade is enabled.

- The **haShow** command indicates an error.
- Any of the following messages display in the error log:
  - "Slot unknown" message relating to a core switch blade slot
  - Core switch blade errors or I2C timeouts
  - FRU: FRU_FAULTY messages for a core switch blade
  - Configuration loader messages or "Sys PCI config" messages
  - Generic system driver messages ("FABSYS")
  - Platform system driver messages ("Platform")
  - Error messages that indicate a problem with a core switch blade
  - Function fail messages for the core switch blade master

For more information about error messages, refer to the *Brocade Fabric OS Message Reference*.

Removing a core switch blade (CR8)

The Brocade DCX continues to operate while a core switch blade is being replaced.

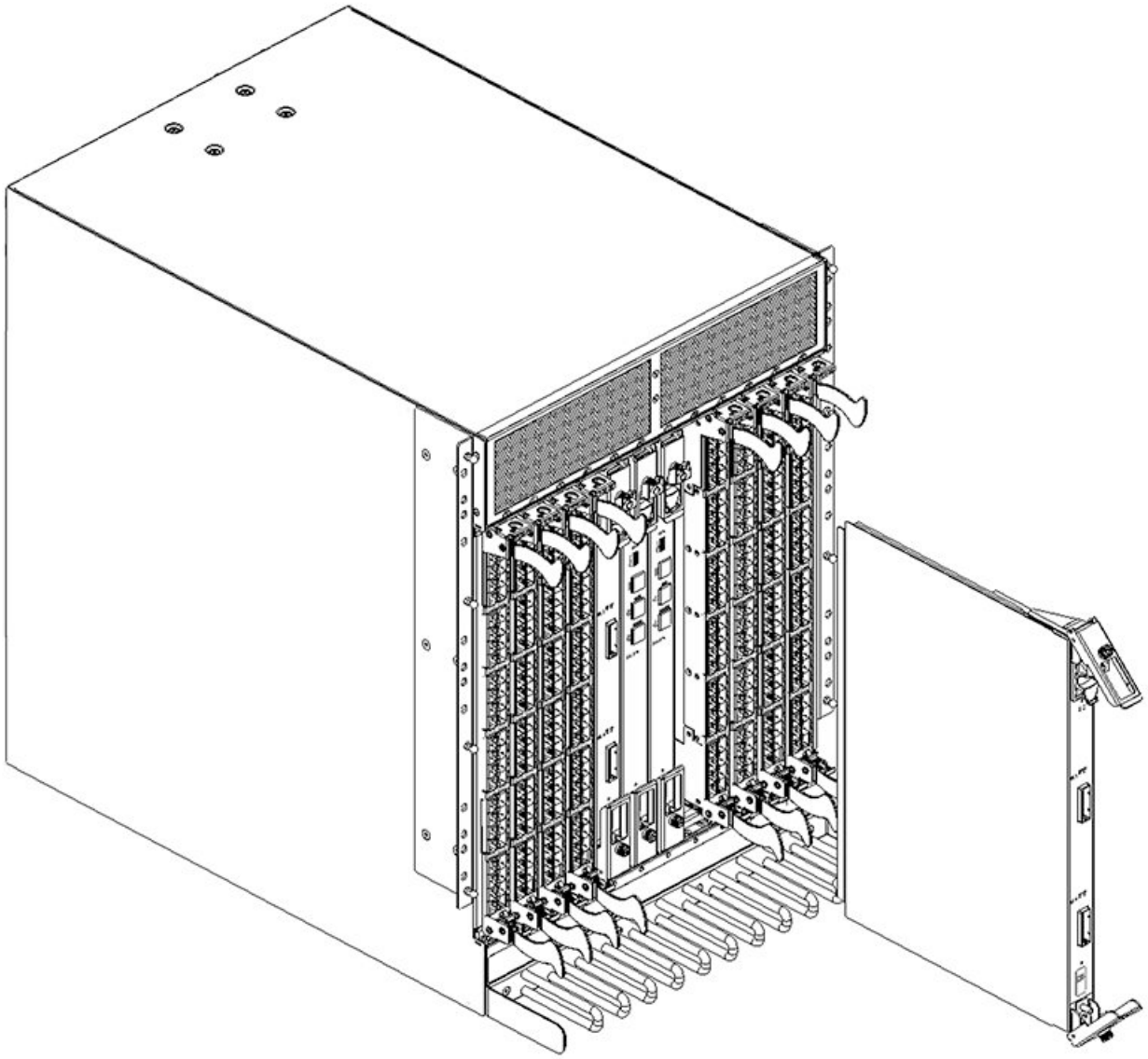
ATTENTION
Follow ESD precautions.

NOTE
The CR8 blade is compatible only with the Brocade DCX.

1. Remove the chassis door (Removal and replacement of the chassis door on page 83).
2. Power off the blade by sliding the slider switch in the top ejector down to the off position. Do not eject the blade until the power LED has gone off and you have completed the next two steps.
3. Disconnect cables from the faulty core switch blade.
4. Unscrew the thumbscrews from both ejectors using the Phillips screwdriver.

5. Open both ejectors simultaneously to approximately 45 degrees and pull the core switch blade out of the chassis.

FIGURE 33 Removal and replacement of the core switch blade (CR8)



Replacing a core switch blade (CR8)

ATTENTION
Follow ESD precautions.

1. Open the ejector handles to approximately 45 degrees.Orient the CP blade so that the handles are toward you and the flat metal side is on your left.
2. Align the flat metal side of the core switch blade inside the upper and lower blade guides in the slot. Slide the core switch blade into the slot until it is firmly seated.

3. Close the ejector handles and then tighten the thumbscrews inside each handle using the Phillips screwdriver.
4. Turn the core switch blade on by sliding the ON/OFF switch in the top handle up, to cover the thumbscrew.
5. Verify that the power LED is green (might require a few seconds). If not, ensure that the core switch blade has power and is firmly seated and that the ejectors are in the locked position.
6. Connect the cables to the new core switch blade. If ICL cables are not used, insert EMI plugs into the cable sockets.
7. Replace the chassis door (Removal and replacement of the chassis door on page 83).
8. Pack the faulty core switch blade in the packaging provided with the new core switch blade, and contact the Brocade DCX supplier to determine the return procedure.

Removal and replacement of the power supply

Use this procedure to remove and replace a power supply.

NOTE
The Brocade DCX can continue operating during the replacement if at least one 220 VAC power supply is operating or at least two 110 VAC power supplies are working. DCX power supplies are 100-240 VAC, auto-sensing.

NOTE
A chassis with slots for eight port blades can have up to four power supplies installed. If you are adding additional power supplies, you can use the procedures in this section under "Replacing a power supply" to install the new power supplies. Be sure to follow steps on those procedures to enable sending notifications when the additional power supplies fail.

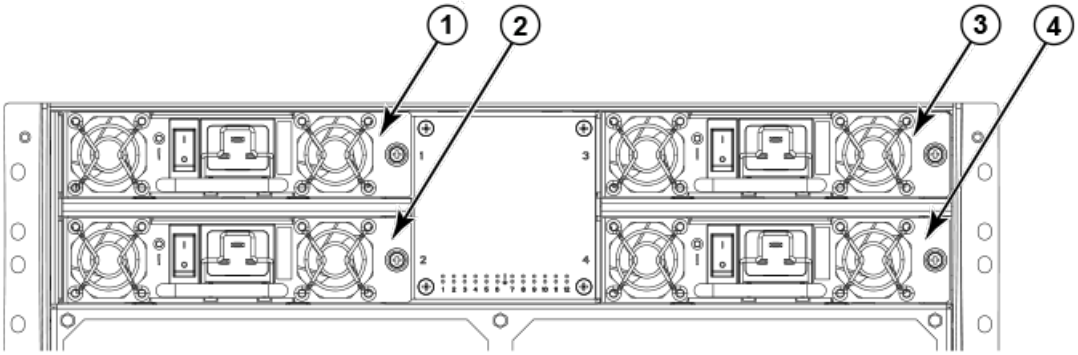
Time and items required

The replacement procedure for each power supply takes less than 5 minutes. A power supply unit or filler panel is required for the power supply replacement.

Identifying power supplies

The following figure shows the location and identification of the power supplies.

FIGURE 34 Power supply identification



1. Power supply 1 (PS1)
2. Power supply 2 (PS2)

3. Power supply 3 (PS3)
4. Power supply 4 (PS4)

Power-cord notice

DANGER

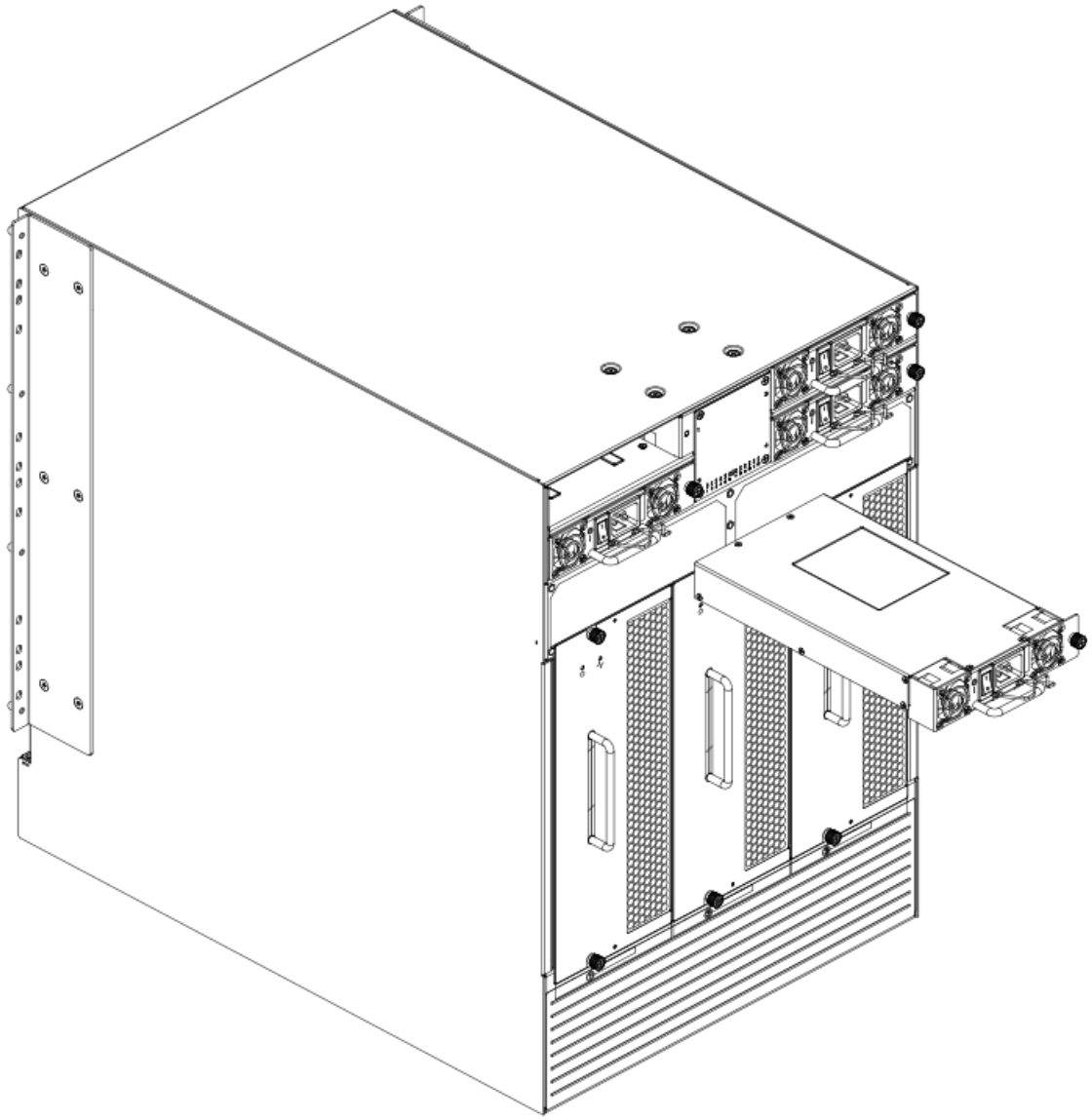
This device might have more than one power cord. To reduce the risk of electric shock, disconnect all power cords before servicing.

Removing a power supply

1. Perform the appropriate following action based on whether the Brocade DCX is operating:
   - If the Brocade DCX is not operating during the replacement procedure, go to step 2.
   - If the Brocade DCX is operating and will continue to operate during the replacement, check the power LEDs to verify that the minimum number of power supplies is functioning. A fully populated Brocade DCX requires a minimum of one power supply at all times.
2. Turn off the power switch.
3. Remove the power cord.
4. Loosen the thumbscrew.
5. Grasp the handle and pull, sliding the power supply from the chassis and supporting the power supply from beneath as you remove it.

6. If you are not replacing the power supply, insert a filler panel into the slot.

FIGURE 35 Removal and replacement of the power supply



Replacing a power supply

1. Remove any filler panel.
2. Insert the power supply into the slot. Verify that the power supply is seated by gently pulling on the handle. The power supply should resist movement as you pull.
3. Tighten the thumbscrew.
4. Replace the power cord.
5. Turn on the power switch.

6. Verify that the power LED on the power supply displays a steady green light.
7. If you are installing two additional power supplies to bring the total power supplies up to four, perform one or both of the following tasks to enable sending notifications if one power supply fails.

   NOTE
   A maxiumum of four power supplies can be installed in the chassis.

   - For Fabric Watch monitoring, change the switchStatus policy settings to the following:

     ```
     switch.status.policy.PowerSupplies.down = 1
     switch.status.policy.PowerSupplies.marginal = 0
     ```

     For more details on executing the **switchStatusPolicyShow** and **switchStatusPolicySet** commands, refer to the *Fabric OS Command Reference*.
   - For Monitoring and Alerting Policy Suite (MAPS) monitoring, follow procedures to update the active MAPS power supply switchstatus policy settings for four PSU devices in the "Additional MAPS features" section of the *Brocade Monitoring and Alerting Policy Suite Administrator's Guide*.

Removal and replacement of the blower assembly

This procedure provides instructions for removing and replacing a blower assembly.

ATTENTION
The Brocade DCX can continue operating during the replacement if the other two blower assemblies are operating,To ensure continuous adequate cooling, maintain three operating blower assemblies at all times except for the brief period when replacing a blower assembly.

Time and items required

The replacement procedure for each blower assembly takes less than 5 minutes. The following items are required for the blower assembly replacement:

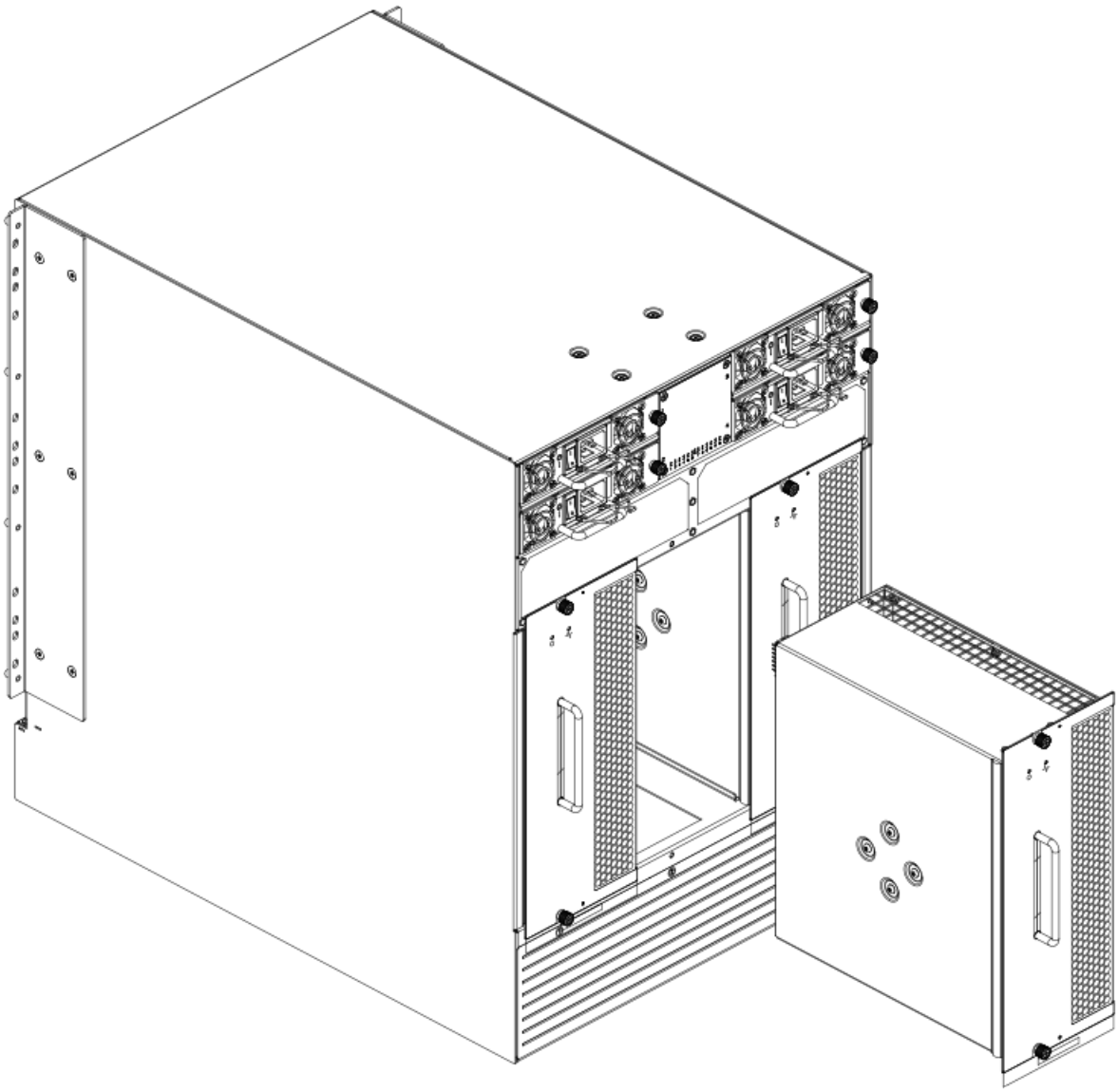
- Replacement blower assembly
- #2 Phillips screwdriver

Removing a blower assembly

1. Before removing a blower assembly, verify that the other blower assemblies are functioning correctly. The power LEDs should be steady green.
2. Use the screwdriver to loosen the captive screws at the top and bottom of the blower assembly.

3. Grasp the handle and pull, sliding the blower assembly from the chassis and supporting the blower assembly from beneath as you remove it.

FIGURE 36 Removal and replacement of the blower assembly



Replacing a blower assembly

1. Orient the blower assembly and slide it into the chassis, pushing firmly to ensure that it is seated.
2. Verify that the power LED displays a green light.
3. Use the screwdriver or your fingers to tighten the captive screws.

WWN card removal and replacement

There are two WWN cards located beneath the WWN bezel (logo plate). As you are facing the bezel on the non-port-side of the chassis, WWN 1 is located on the left side, and WWN 2 is on the right. Before replacing cards, refererence RASlog messages and use the WWN Recovery Tool (**wwnrecover**) as directed in the following sections to recover WWN cards. The tool will direct you to contact customer support if recovery fails. In these cases, Brocade Support will determine whether one or both WWN cards need replaced and will request the partner or OEM to send WWN cards from FRU inventory to the nearest Brocade Support office to be reprogrammed.

This section provides information on RASlog messages indicating WWN card problems, the WWN Recovery Tool, and complete steps to remove and replace WWN cards.

The following WWN card replacement procedures are available:

- Hot-swap procedure. Use this procedure when replacing one WWN card only. This procedure is non-disruptive as a system reboot is not required under most conditions.

  NOTE
  After replacing a WWN card using this procedure, RASlog messages EM-1220 or EM-1222 may indicate that a discrepancy or mismatch is detected between the WWN cards. You must monitor messages for errors and warnings, and then follow directions in messages to use **wwnrecover** for recovery . The **wwnrecover** tool may prompt you to reboot the control processors (CP) if the system is running with invalid IP addresses because the system was booted with a replacement card for WWN card 1.

- System power-down procedure. Use this procedure when replacing both WWN cards. This procedure disrupts system operations. Observe the following when replacing both WWN cards:
  - No additional reboot is required following card replacement after powering the system down.
  - If Brocade support has determined that both WWN cards need replaced, you must power-down the chassis, and then replace both WWN cards as a matched pair.
  - Be aware that if replacing both WWN cards, the IP addresses on the new WWN cards will be in effect when the chassis powers up. If these IP addresses are different from the previous cards, then you will not be able to establish ssh or other sessions that use the previous IP addresses. You can change IP addresses on the new cards using the **ipaddrset** command.

  NOTE
  If replacing the chassis, you do not need to remove WWN cards from chassis as they ship with replacement chassis.

Time and items required

If there is a need to replace one or both WWN cards, allow approximately 20 minutes. Refer to Using wwnrecover 7.4 on page 106 and Verifying the need for replacement on page 106 before replacement.

The following items are needed to replace the WWN cards:

- Electrostatic discharge (ESD) grounding strap
- #2 Phillips screwdriver (required only for some versions of the WWN card)
- If a serial console session is used: serial cable and a workstation computer with a terminal emulator application (such as HyperTerminal for Windows systems or TIP for Solaris systems)

Using the wwnrecover utility

The **wwnrecover** utility permits a recovery of WWN card data in the event of corruption. Recovery is not possible if hardware issues prevent access to either WWN card or if the primary and backup copy of the license ID on either card is corrupted. This utility is not available in Fabric OS prior to v7.4.0.

Identical data must be maintained on each WWN card at all times so that if one card fails, the system can use the other card to provide valid system operation. To maintain data and ensure its integrity, the audits both WWN cards one hour after the first system boot-up, every 24 hours after boot-up, and any time a WWN card is inserted to compare the critical data.

If a data mismatch is detected during the audit, messages in the RASlog will provide a summary of all errors detected and prompt you through a data recovery process. The data recovery mechanism may vary depending on the error encountered and the data being compared. Problems such as a mismatch between license IDs cannot be fixed with **wwnrecover**, and the output will direct you to call Brocade Technical Support. For other problems, running **wwnrecover** can pinpoint the problem and, in some cases, permit you to fix it. Mismatched data can be resolved, and corrupt data can sometimes be recovered.

The following table lists RASlog messages that can occur during the WWN card audit routine.

TABLE 13 RASlog messages from WWN card audit

Error message	Issue
[EM-1220]...M1, ERROR ... A problem was found on one or both CID cards (x), please run the wwnrecover tool to get more information and recovery options.	Some kind of error or mismatch has been detected in the WWN card audit.
[EM-1221], ... M1, INFO, ... A WWN card has been inserted, a WWN verification audit will be run to detect any mismatches or other problems.	A second WWN card is enabled and the WWN card audit will be run. If an error is detected during the audit, EM-1220 and EM-1222 messages are generated.
[HIL-1650], CHASSIS, ERROR...Unable to detect WWN card in chassis. Access to WWN halted...	WWN card has been removed from the chassis. Replace as soon as possible since system is in degraded state.
[EM-1222], ... M1, WARNING, ... A WWN card access problem has been encountered, please run the wwnrecover tool to get more information and recovery options.	An error is detected during normal access to the WWN cards; typically, one of the cards is corrupted or inaccessible.
Recovery is not possible. Please contact Brocade Technical Support for replacement of the corrupted or inaccessible WWN(s).	The license ID on the two WWN cards do not match.

The **wwnrecover** utility must be used to maintain data integrity when replacing one or both WWN cards using instructions in the WWN card removal and replacement section. To run **wwnrecover**, log in as admin and enter the following command:

```
switch:admin# wwnrecover
```

For more information on **wwnrecover** and command syntax, refer to the *Brocade Fabric OS Command Reference*.

Verifying the need for replacement

Before replacing a WWN card, verify that the replacement is necessary. Any of the following events can indicate that the card requires replacement:

- Status LEDs on the WWN bezel not reflecting the actual status of the components.
- Power or Status LEDs on WWN card (beneath logo plate) indicate a problem.
- Problems viewing or modifying the data stored on the WWN card.
- Error messages regarding WWN units #1 or #2 from the **chassisshow** output.
- If an EM-1220 or EM-1222 error message occurs in the RASlog and WWN card recovery is not successful using **wwnrecover**.

NOTE
In the event of an EM-1220 or EM-1222 error message due to WWN card data corruption or data mis-matches across WWN cords, data recovery may be possible using the **wwnrecover** utility. For more information on using this utility, refer to Using wwnrecover on page 106.

Preparing for WWN card replacement

If the WWN cards require replacement, complete the following steps. Follow electrostatic discharge (ESD) precautions.

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

1. Open a Telnet session to the chassis and log in to the active CP as admin. The default password is "password".
2. Verify that you are logged in to the active CP. Run the **haShow** command to determine the active CP.
3. Run the **supportSave** command on the active CP to capture all settings. These settings will be referenced to verify the settings have been correctly programmed after WWN replacement.
4. Contact Brocade Technical Support for replacement of WWN cards. Brocade Support will request the partner or OEM to send WWN cards from FRU inventory to the nearest Brocade Support office to be reprogrammed. Brocade Support will require the **Supportsave** data taken in the previous step so that the replacement cards can be reprogrammed prior to shipping to the partner or your site. If Brocade support has determined that both WWN cards need replaced, you must power-down the chassis, and then replace both WWN cards as a matched pair.

   NOTE
   Do not execute the **frureplace** command. The command will no longer be functional beginning with the release of Fabric OS 7.0.0c, but users with earlier versions of the Fabric OS should also *not* run the command.

Hot-swap replacement

You may replace one WWN card with the system powered on using the following steps to avoid interruption of system operation.

Use this procedure if Brocade Customer Support has determined that a WWN card needs replaced and you have received replacement cards. These procedures require use of the **wwnrecover** utility. For more information on this utility, refer to Using wwnrecover on page 106.

You can use this procedure to replace one WWN card at a time while power is on. Follow all steps for one card, and then repeat the same steps to replace the other card. To replace both WWN cards simultaneously, use procedures under Power-down replacement on page 108.

1. Remove the defective WWN card using procedures under Removing the WWN card and WWN bezel (logo plate) on page 110 applicable to hot-swap replacement of WWN cards.

   NOTE

   Do not use steps in the WWN card and WWN bezel removal procedures to disable logical switches and power down the chassis.

   Removing a WWN card will result in RASlog messages indicating that a WWN card cannot be detected. Since the system will be in a degraded state, install a WWN card as soon as possible.
2. Install the replacement WWN card into the empty slot.

   When replacing cards, hold each card by the edges and insert the WWN cable onto the WWN module until the cables are fully seated.

3. Verify that the WWN card is correctly connected by noting if the LEDs on the card reflects the status of the components.
4. Address any issues flagged by any RASlog EM-1220 and EM-1222 messages that display for the new card before proceeding.

   NOTE
   Issues relating to data recovery on new WWN cards must be resolved at this point before proceeding to avoid invalid WWN data, errors, and operating problems. If EM-1220 messages indicate that IP addresses on installed WWN cards do not match, follow instructions in the message to recover the IP address so that both cards use the same address.
5. Determine the active CP by entering the **haShow** command.
6. On the active CP, run the **wwnrecover** command and specify the WWN card that you replaced (WWN 2 or WWN 1) when prompted.
7. If **wwnrecover** messages prompt for a system reboot, reboot both CPs to ensure the system is running with valid WWN card data.
8. Enter the **hafailover** command to force failover so that the standby CP becomes the active CP.

   This command is necessary so that the correct IP address for the new card displays for the **ipaddrshow** command. For more information on these commands, refer to the *Brocade Fabric OS Command Reference*.
9. Verify the new card settings by running the following commands and comparing the output with the original **supportsave** data:
   - **licenseidshow**
   - **ipaddrshow**
   - **switchname**
   - **chassisname**
   - **wwncardshow ipdata**
   - **chassisshow** (look at the WWN and Chassis information at the bottom)
10. If replacing the second WWN card, repeat steps 1-11 for the other card.
11. Install the WWN bezel. Orient the bezel on the chassis. Insert and tighten the screws.
12. Pack faulty WWN cards in the packaging provided with the replacement cards, and return them to Brocade Support for failure analysis (FA).

Power-down replacement

Use these procedures when you can interrupt system operation and replace one or both WWN cards with the system powered down.

Use this procedure if Brocade Customer Support has determined that a WWN card needs replaced and you have received the replacement card. These procedures require use of the **wwnrecover** utility.

NOTE
You can use this procedure if replacing one or both WWN cards, however you *must* use this procedure if replacing both WWN cards. If Brocade support has determined that both WWN cards need replaced, you must power-down the chassis, and then replace both WWN cards as a matched pair. Obtain replacement cards through your Brocade product support representative.

Follow electrostatic discharge (ESD) precautions. Wear a wrist grounding strap connected to chassis ground (if the chassis is plugged in) or a bench ground.

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

NOTE
Be aware that if replacing both WWN cards, the IP addresses on the new WWN cards will be in effect when the chassis powers up. If these IP addresses are different from the previous cards, then you will not be able to establish ssh or other sessions that use the previous IP addresses. You can change IP addresses on the new cards using the **ipaddrset** command.

1. Unpack the replacement WWN card(s) and save the packaging for the faulty WWN card(s).
   The WWN cards and cables are labeled #1 for the left slot and #2 for the right slot.
2. Power down the chassis and remove the defective WWN card(s) following appropriate steps under Removing the WWN card and WWN bezel (logo plate) on page 110.

   NOTE
   There are two WWN cards located beneath the WWN bezel (logo plate). As you are facing the bezel, WWN 1 is located on the left side, and WWN 2 is on the right.
3. Install the replacement WWN card into the empty slot.

   When replacing cards, hold each card by the edges and insert the WWN cable onto the WWN module until the cables are fully seated.
4. Power on the chassis and wait for five minutes for the chassis to boot.
5. Verify that the new WWN card is correctly connected by noting if the LEDs on the card reflects the status of the components.

   NOTE
   The LEDs may take up to two minutes after WWN card installation to begin functioning.
6. Resolve any issues flagged by RASlog EM-1220 and EM-1222 messages that display for the new card(s) before proceeding.

   NOTE
   Issues relating to data recovery on new WWN cards must be resolved at this point before proceeding to avoid invalid WWN data, errors, and operating problems.
7. Determine the active CP by entering the **haShow** command.
8. On the active CP, run the **wwnrecover** command and specify WWN 2 card for recovery when prompted in **wwnrecover** output messages. Refer to Using wwnrecover on page 106 for more information on this command.
9. If **wwnrecover**messages prompt for a system reboot, reboot both CPs to ensure the system is running with valid WWN card data.
10. Verify the new card settings by running the following commands and comparing the output with the original **supportsave** data:
    - **licenseidshow**
    - **ipaddrshow**
    - **switchname**
    - **chassisname**
    - **wwncardshow ipdata**
    - **chassisshow** (look at the WWN and Chassis information at the bottom)
11. Run the **switchcfgpersistentenable** command to persistently enable each logical switch, that was disabled before removing the WWN card(s):

```
switch:FID128:root> switchcfgpersistentenable
Switch's persistent state set to 'enabled'
```

12. Install the WWN bezel on the chassis.
    a) Orient the bezel on the chassis.
    b) Insert and tighten the screws.

13. Pack faulty WWN cards in the packaging provided with the replacement cards, and return them to Brocade Support for failure analysis (FA).

Removing the WWN card and WWN bezel (logo plate)

Two WWN cards located beneath the WWN bezel (logo plate). As you are facing the bezel on the non-port-side of the chassis, WWN 1 is located on the left side, and WWN 2 is on the right. When cards have been determined faulty and the replacement WWN cards have been received, complete the following steps to remove the bezel and faulty WWN cards.

Follow electrostatic discharge (ESD) precautions. Wear a wrist grounding strap connected to chassis ground (if the chassis is plugged in) or a bench ground.

DANGER

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

1. Open a Telnet session to the chassis and log in to the active CP as admin. The default password is "password".
2. Verify that you are logged in to the active CP. Run the **haShow** command to determine the active CP.
3. Run the **supportsave** command on the active CP to capture all settings. If any problem occurs during the replacement, the **supportsave** information will be important for solving the problem.

4. Run the following commands on the chassis before replacing the cards so that the data can be verified after the replacement:
   1. **licenseidshow**
   2. **ipaddrshow**
   3. **switchname**
   4. **chassisname**
   5. **wwncardshow ipdata**
   6. **chassisshow** (look at the WWN and Chassis information at the bottom)
   7. **ficonshow switchrnid** (FICON/mainframe environments only)
   8. **configupload**

   The factory serial number and the sequence number in the following outputs should match, except in the **ficonshow switchrnid**, which will have a number appended to the front indicating that the logical switch number, if virtual fabrics is enabled:

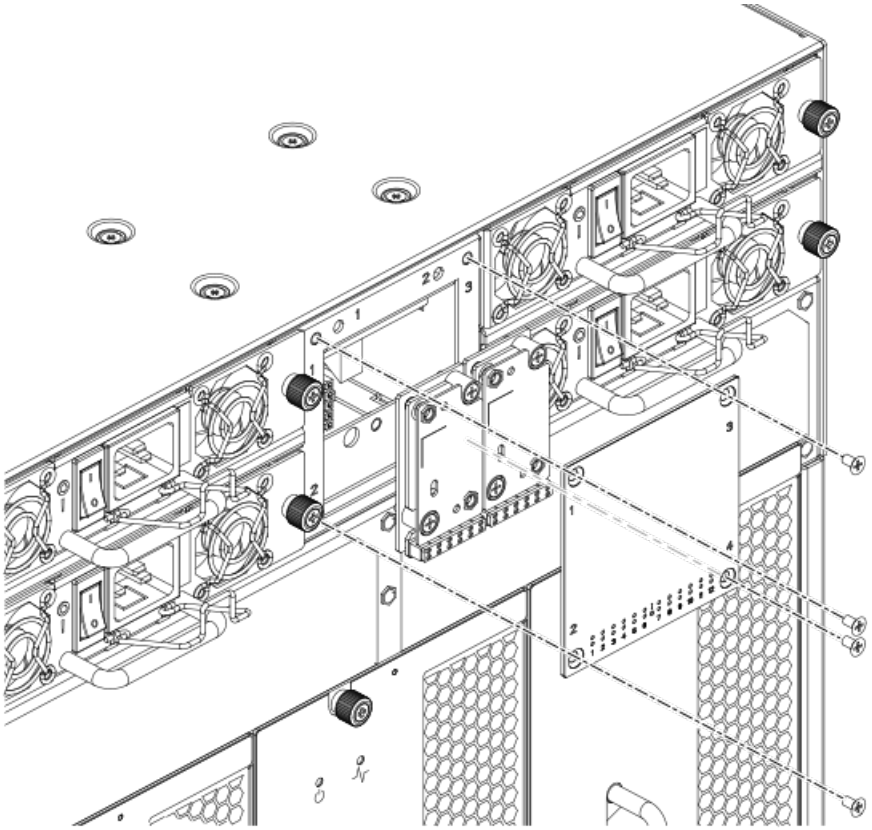
```
switch:FID128:admin> chassisshow
<output truncated>
WWN  Unit: 1
Header Version:         2
Power Consume Factor:   -1
Factory Part Num:       60-1000491-05
Factory Serial Num:     AFX2533G001
Manufacture:            Day: 19  Month:  1  Year: 2012
Update:                 Day:  5  Month:  5  Year: 2014
Time Alive:             756 days
Time Awake:             3 days

WWN  Unit: 2
Header Version:         2
Power Consume Factor:   -1
Factory Part Num:       60-1000491-05
Factory Serial Num:     AJX0416G02H
Manufacture:            Day: 12  Month:  8  Year: 2011
Update:                 Day:  5  Month:  5  Year: 2014
Time Alive:             897 days
Time Awake:             3 days

Chassis Factory Serial Num: AFY2530G00S

switch:admin> ficonshow switchrnid
{
 {Switch WWN               Flag Parm
  10:00:00:05:1e:95:b1:00  0x00 0x200a00
  Type number:          SLKWRM
  Model number:         DCX
  Manufacturer:         BRD
  Plant of Manufacture: CA
  Sequence Number:      0AFX2533G001
  tag:                  b6ff
 }
```

5. If performing the power-down replacement procedure, perform the following steps. If hot-swapping WWN cards, skip to step 6.
   a) Log in to the chassis and execute the **switchcfgpersistentdisable** command on the main switch and other logical switches. The **switchcfgpersistentdisable** command disables the switches, and ensures they remain disabled after the power is cycled. This allows you to check all the settings so that you can verify the settings before placing the chassis back into production.

      ```
      switch:admin> switchcfgpersistentdisable
      Switch's persistent state set to 'disabled'
      ```

      If there are other logical switches on your chassis, use the **setcontext** command to connect to all the other switches and then run **switchcfgpersistentdisable** on these switches as well.
   b) Power down the entire chassis.
6. Remove the screws from the WWN bezel on the back of the chassis. Pull the bezel away from the chassis and set it aside. The two WWN cards are now visible.

FIGURE 37 Removal and replacement of the WWN bezel (logo plate) and WWN card



7. Depending on the WWN card removed, label the card and cables with #1 for the left side and #2 for the right side for future reference.
8. Disconnect the WWN cable by depressing the cable connector latch and pulling the connector from the WWN module.
9. Hold the WWN card by its edges and gently pull it out from the chassis.
10. Set the WWN card on a static-free surface, such as a grounding pad.

Removal and replacement of the transceivers

NOTE
The 8-Gbps-capable mSFPs and SFP+s auto-negotiate at 2, 4, and 8 Gbps. The 4-Gbps SFPs auto-negotiate at 1, 2, and 4 Gbps. The mSFPs are compatible only with the FC8-64 high density port blade.

NOTE
The XFP transceivers are used only with the FC10-6 port card. They should not be used in any 1 GE port.

Time Required

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

Items Required

- Replacement mSFP, SFP, SFP+, or XFP
- Optical transceiver extraction tool (for SFP, SFP+, and XFP transceivers)

Removing and replacing an SFP, SFP+, or XFP optical transceiver

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

FIGURE 38 Optical transceiver (SFP, SFP+, and XFP) extraction tool

Removing an SFP, SFP+, or XFP transceiver

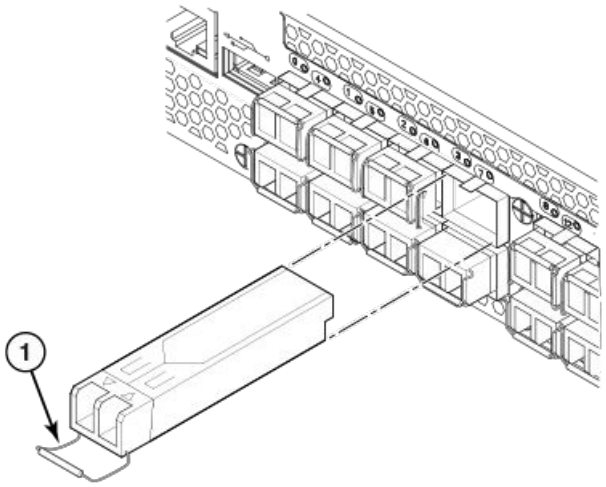
NOTE
mSFP optical transceivers should not be inserted into ports intended for SFP or SFP+ transceivers. They will be faulted on power-up for Fabric OS 6.4.0 and later.

To remove an SFP, SFP+, or XFP (FC6-10 blade only) transceiver, complete the following steps.

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

2. Pull the bail (wire handle) away from its pivot point and out, sliding the transceiver out of the switch or blade.

FIGURE 39 Replacing an optical transceiver



1. SFP/XFP bail

Replacing an SFP, SFP+, or XFP transceiver

1. Position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   Transceivers are keyed so that they can only be inserted with the correct orientation. If a transceiver does not slide in easily, ensure that it is correctly oriented.
2. Position a cable so that the key (the ridge on one side of the cable connector) is aligned with the slot in the transceiver. Insert the cable into the transceiver until the latching mechanism clicks.

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

Removing and replacing an mSFP optical transceiver

NOTE
mSFP optical transceivers should not be inserted into ports intended for SFP or SFP+ transceivers. They will be faulted on power-up For Fabric OS 6.4.0 and later.

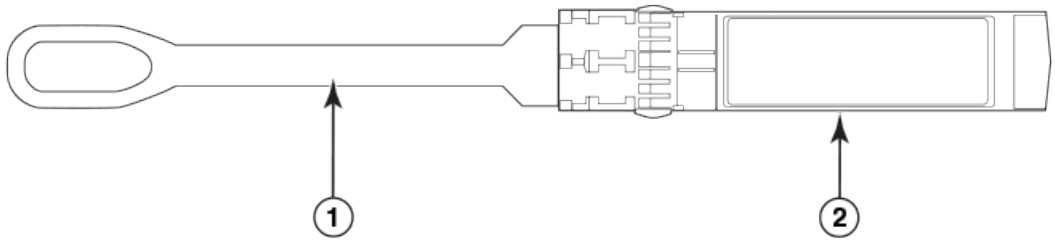
To replace an mSFP transceiver, complete the following steps. Note that it is recommended that the optical cable should be either removed from or inserted into the mSFP while the transceiver is out of the switch or blade.

Removing an mSFP transceiver

NOTE
The mSFP transceivers are used only with the FC8-64 port blade. Narrower OM-3 LC cables are used to connect the FC8-64. These cables are offered by major manufacturers like Corning, Molex, and Amphenol.

NOTE
The pull tabs are not designed to be bent. Doing so may result in damage to the pull tab.

FIGURE 40 Optical mSFP transceiver



1. Pull tab
2. mSFP transceiver

1. Grasp the pull tab firmly and pull the unit out of the port.
2. Remove the cable from the transceiver.

Replacing an mSFP transceiver

1. Insert the cable into the new transceiver until the latching mechanism clicks.
2. Position the optical transceiver so that the key is oriented correctly to the port. Insert the transceiver into the port until it is firmly seated and the latching mechanism clicks.

   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.

Removal and replacement of the inter-chassis link (ICL) cables

NOTE
ICL ports can be used only with an ICL license. After the addition or removal of a license, the license enforcement is performed on the ICL ports only when the **portdisable** and **portenable** commands are issued on the ports. An ICL license must be installed on all Brocade Backbones forming the ICL connection. The backbones can be any combination of up to three Brocade DCX-4S and Brocade DCX chassis.

NOTE
For FOS 6.4.0 and later, three DCX chassis can be supported in a triangular ICL configuration as long as the third chassis is housed in an immediately adjacent rack so that the cables can reach the ICL ports.

ATTENTION
If ICL cables are not in use, the ports must have EMI plugs installed to meet EMI and other regulatory certifications.

The following table describes the ICL connector port LED patterns and the recommended actions for those patterns.

TABLE 14 ICL connector port LEDs

LED purpose	Color	Status	Recommended action
LINK LED	No light (LED is off)	No ICL or ICL cable present, but no connection.	Ensure that the ICL cable is correctly installed.
	Steady green	ICL connected.	No action required.
ATTN LED	No light (LED is off)	ICL operational.	No action required.
	Blinking amber	Attention required.	Ensure that the ICL cable is correctly installed.

Follow this procedure to install the ICL cables. Refer to the*Brocade Fabric OS Administration Guide* for the configuration procedure and requirements

The next figure shows an ICL cable. The ICL cables (2 meters long) and the ICL connectors are color-coded and labeled for ease of installation. The other figures in this section show the acceptable cabling configurations for the inter-chassis link (ICL) feature. Connect the ICL cables in one of the configurations shown.

Time and items Required

The replacement procedure for an ICL cable takes less than five minutes.

Replacement ICL cable.

Removing an ICL cable

ATTENTION
To prevent the latch mechanism from wear, use the color-coded (green) latch-release tab for cable removal. Pull the tab to disengage the retention latch before cable removal.

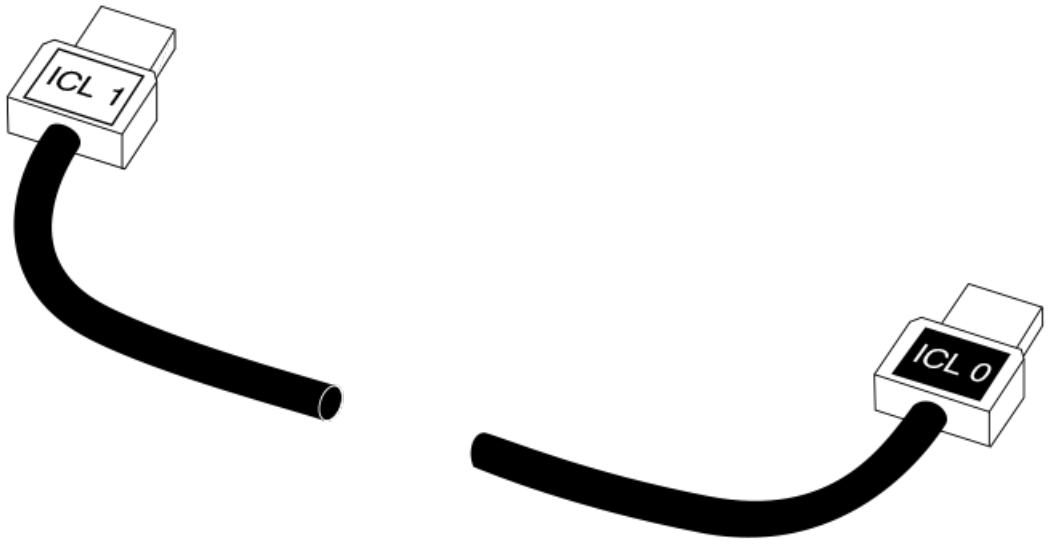
ATTENTION
Connect the cables from the top connectors (ICL 1) of the core blades in one chassis to the bottom connectors (ICL 0) of the core blades in another chassis. Similarly, connect the cables from the bottom connectors (ICL 0) of the core blades in one chassis to the top connectors (ICL 1) of the core blades in another chassis.Pay special attention to this configuration when creating a 3-way connection among three chassis.The ports and cable connectors are color-keyed to help keep the orientation correct.

NOTE
The cables can cross between the slot 5 CR8 blade and the slot 8 CR8 blade as long as the top-to-bottom rule is followed.

1. Using the latch release tabs, pull each plug on the cable from its respective socket on the core switch blades (CR-8). If you are installing cables for the first time, remove the EMI plugs from the sockets.

2. Repeat for each cable that requires replacement.

FIGURE 41 ICL cable



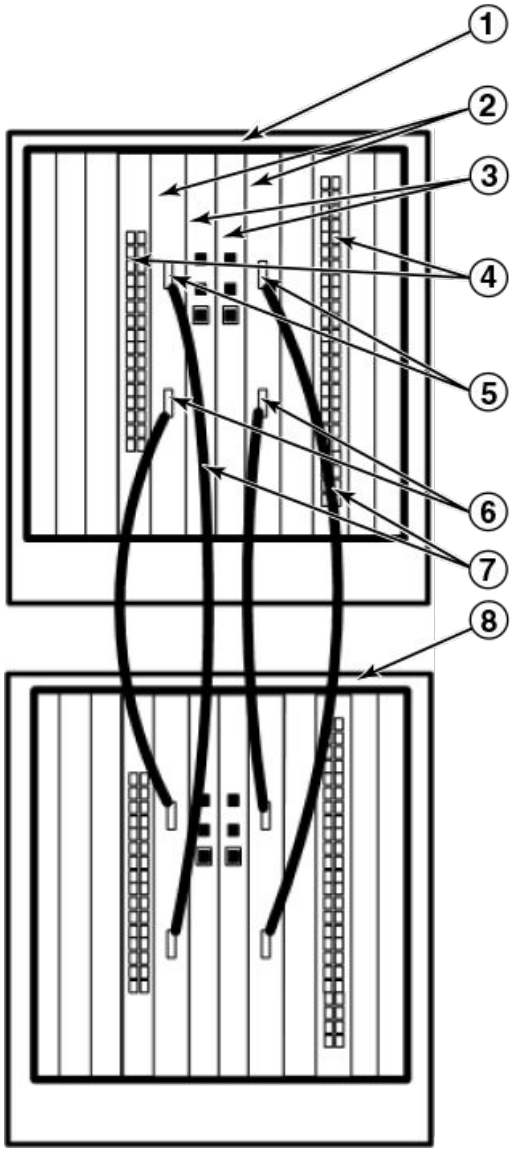
Replacing an ICL cable

1. Align the color-coded and labeled (ICL 1 and ICL 0) plugs on either end of the ICL cable with their respective connectors on the core switch blades (CR-8).
2. Push each plug in until the latch mechanism clicks into place.
3. Repeat steps 1 and 2 for each cable that requires replacement.

   If you are installing ICL cables for the first time, pay particular attention to the configuration in which the cables must be installed.

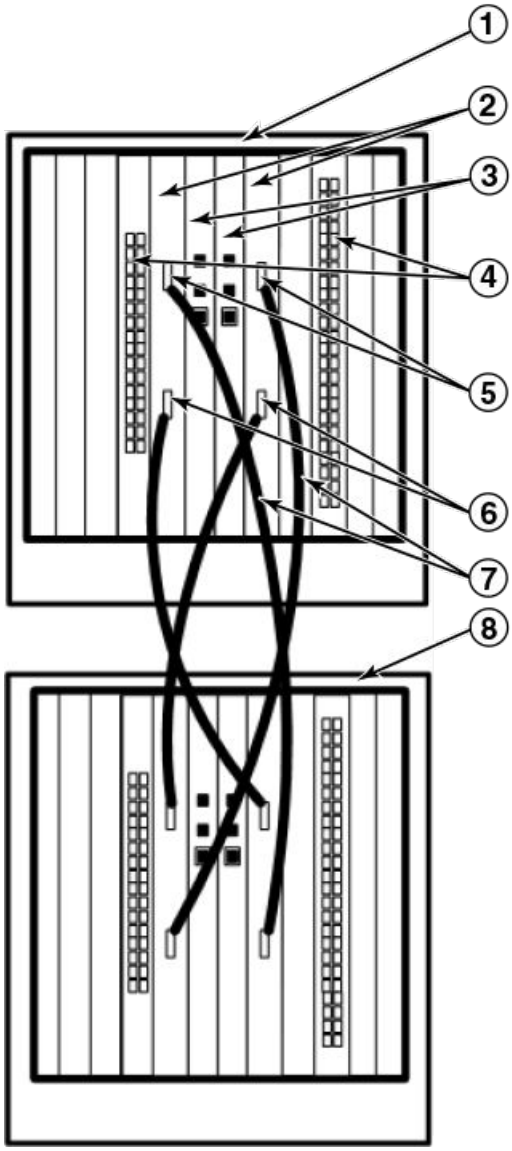
4. Once all the cables are attached, see the *Brocade Fabric OS Administration Guide* for the configuration procedure.

FIGURE 42 ICL cable connections - Configuration 1



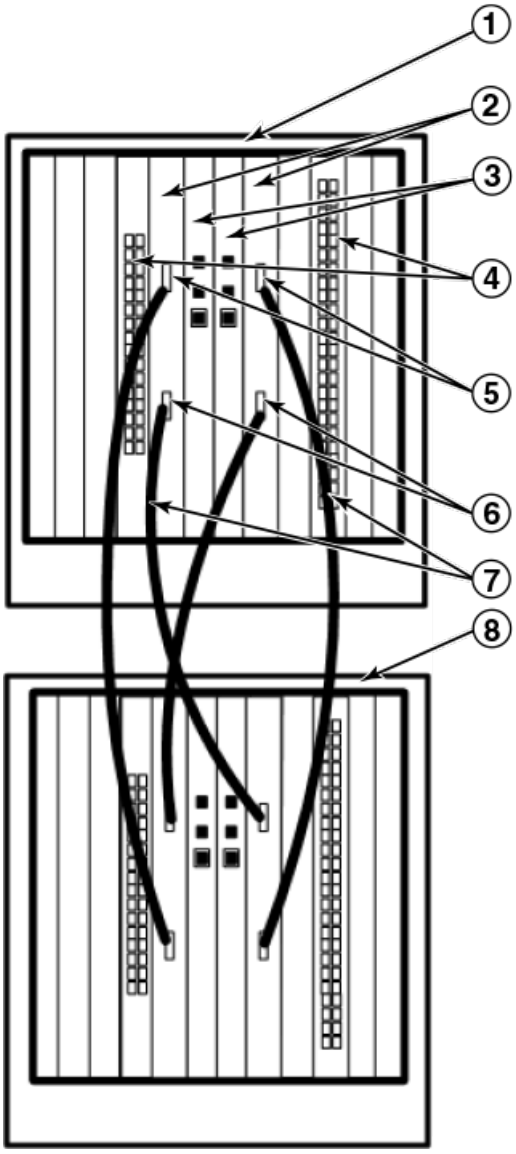
1. Chassis 1
2. Core switch blades (CR8)
3. Control processor blades (CP8)
4. Port blades
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)
7. ICL cables
8. Chassis 2

FIGURE 43 ICL cable connections - Configuration 2



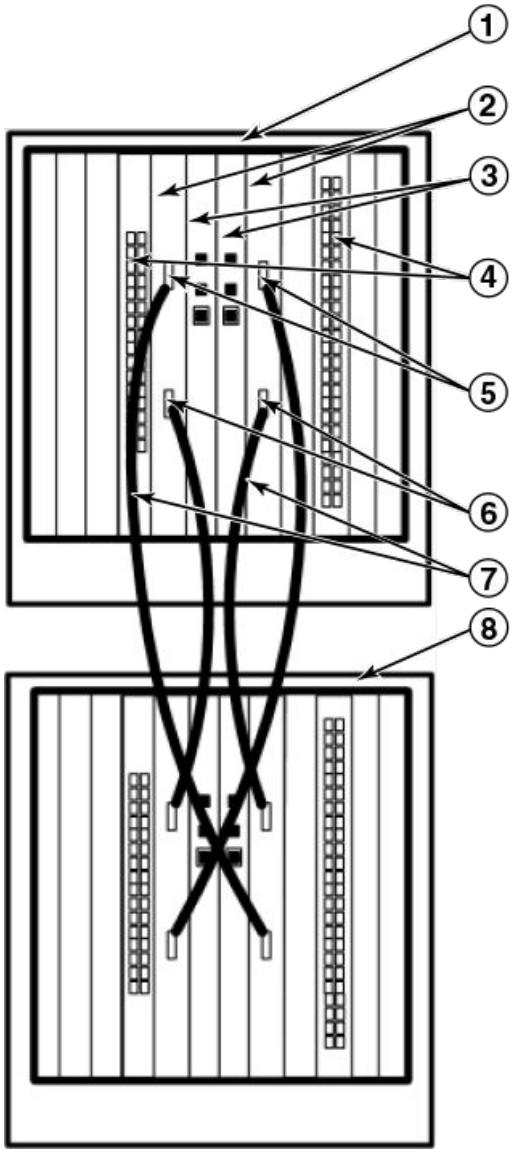
1. Chassis 1
2. Core switch blades (CR8)
3. Control processor blades (CP8)
4. Port blades
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)
7. ICL cables
8. Chassis 2

FIGURE 44 ICL cable connections - Configuration 3



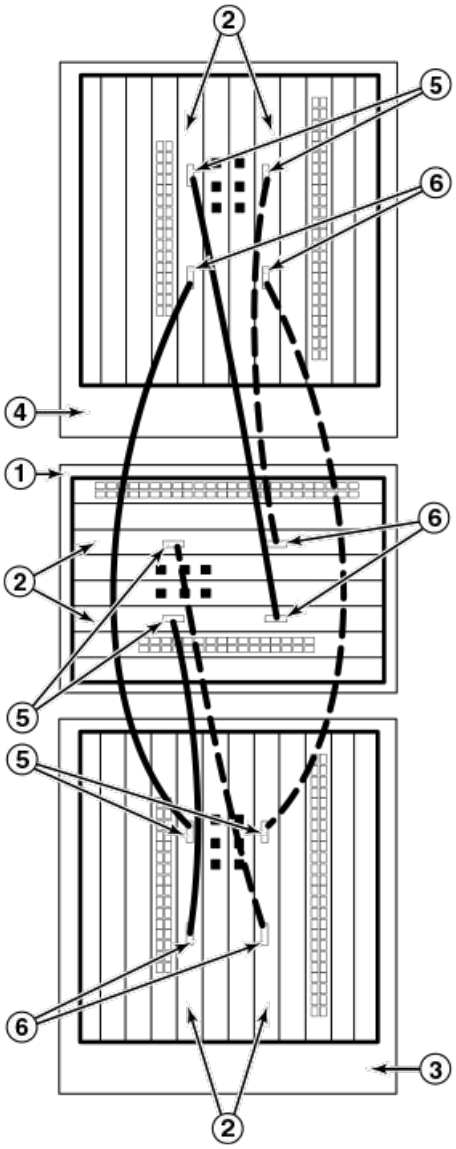
1. Chassis 1
2. Core switch blades (CR8)
3. Control processor blades (CP8)
4. Port blades
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)
7. ICL cables
8. Chassis 2

FIGURE 45 ICL cable connections - Configuration 4



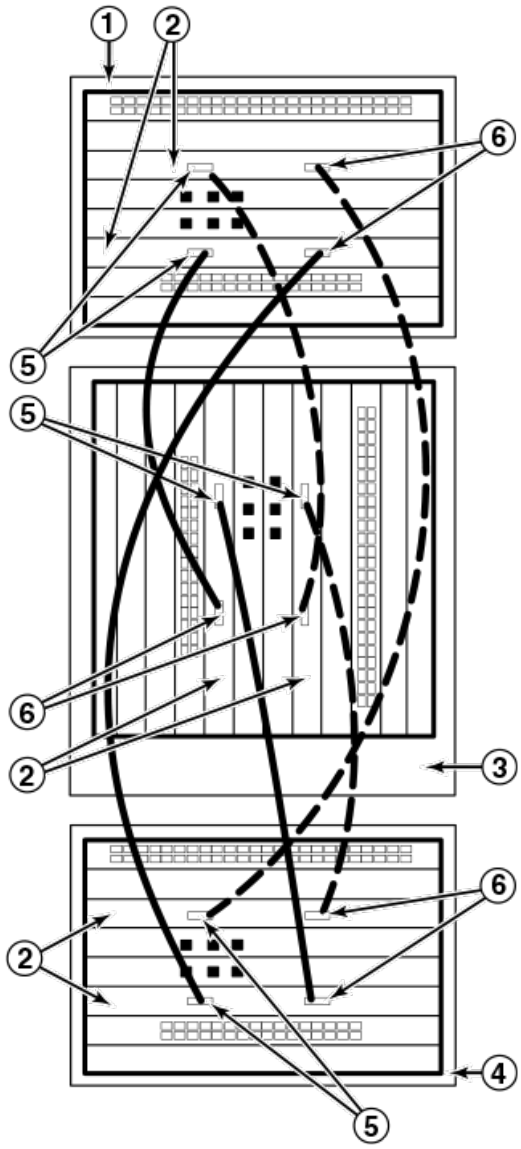
1. Chassis 1
2. Core switch blades (CR8)
3. Control processor blades (CP8)
4. Port blades
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)
7. ICL cables
8. Chassis 2

FIGURE 46 3-way ICL cable connections



1. Chassis 1
2. Core switch blades
3. Chassis 2
4. Chassis 3
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)

FIGURE 47 3-way ICL cable connections

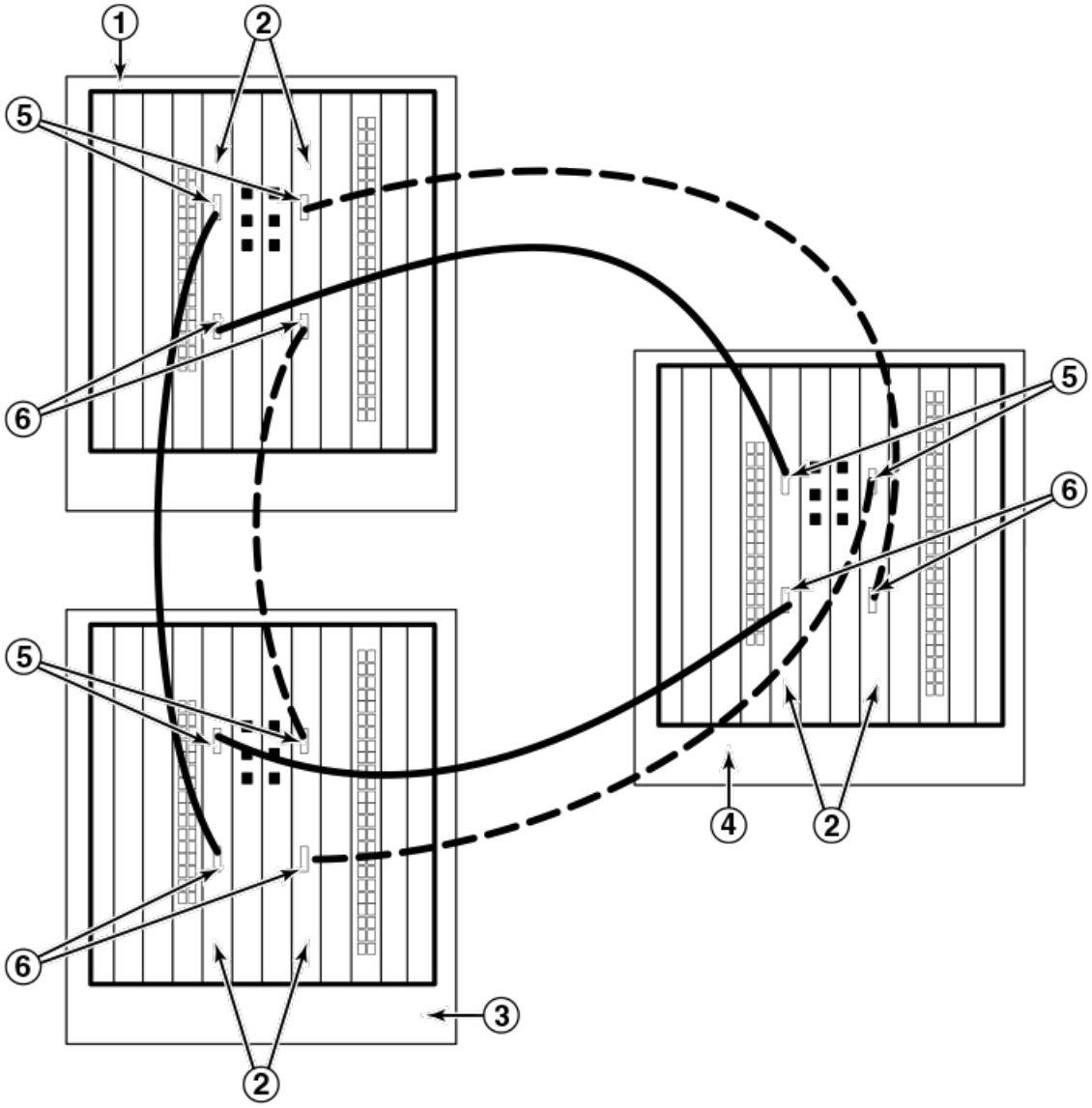


1. Chassis 1
2. Core switch blades
3. Chassis 2
4. Chassis 3
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)

NOTE

The same general configuration applies regardless of which backbone chassis are used. To keep all three chassis i*n the same rack* , any combination of DCX and DCX-4S backbones can be used *except* three DCX chassis.

FIGURE 48 3-way ICL cable connections



1. Chassis 1
2. Core switch blades
3. Chassis 2
4. Chassis 3
5. ICL connector (ICL 1)
6. ICL connector (ICL 0)

For Fabric OS 6.4.0 and later, you can use three DCX chassis is an ICL configuration if the third chassis is in an immediately adjacent rack.

NOTE

For clarity, the two "sets" of cables are drawn differently in Figure 46 through Figure 48. Also note that one set is connected to only the blades in the "low order" slots (slot 3 in the DCX-4S and slot 5 in the DCX) and the other set is connected to the blades in the "high order" slots (slot 5 in the DCX-4S and slot 8 in the DCX). Keeping the sets apart in this manner minimizes the cable confusion.

Removal and replacement of the Brocade DCX chassis

This section describes how to remove and replace the Brocade DCX chassis (with its backplane). The basic steps are:

1. Verifying need for replacement on page 125
2. Recording critical Brocade DCX and SAN information on page 126
3. Disconnecting from network and fabric on page 129
4. Removing components from the chassis on page 130
5. Installing the replacement chassis on page 130
6. Installing components into the new chassis on page 131
7. Verifying correct operation of system on page 132
8. Reconnecting the system to the network and fabric on page 134
9. Verifying correct configuration of the fabric on page 135

NOTE
The Brocade DCX must be removed from the fabric and powered off to perform this procedure. Contact your support provider if you have any questions about whether the chassis requires replacement.

Time and items required

The chassis replacement takes approximately 3 hours.

The following items are required for the chassis replacement:

- Electrostatic discharge (ESD) grounding strap
- ESD grounding pads for protecting all blades and WWN cards
- Serial cable and workstation computer with a terminal emulator application (such as HyperTerminal for Windows systems or TIP for Solaris systems), required only if serial console session used
- Pallet jack or hydraulic or assisted lift that raises a minimum of 140 cm (55 in.) and carries a minimum of 113 kg (250 lb)
- A surface on which to place the old chassis, such as a second lift or the pallet originally provided with the old chassis
- #2 Phillips screwdriver

Verifying need for replacement

Verify that replacement of the chassis is necessary. Ensure that the components are firmly seated when troubleshooting, and contact your support provider with any questions about whether the chassis should be replaced.

Any of the following events might indicate the need to replace the chassis:

- Visible mechanical damage to the chassis, including damage to sheet metal or card guides that prevents correct installation of a blade.

- Bent or damaged connectors on the backplane (the surface inside the chassis to which the blades connect).
- One or more components (such as a power supply, blower assembly, port blade, control processor blade (CP8), core switch blade (CR8), or WWN card) do not function properly even after the component was replaced.
- The **psShow** or **fanShow** commands continue to show a faulty component even though the component was replaced.
- The **slotShow** command continues to show a faulty control processor (CP8), core switch (CR8), or port blade even though the blade was replaced.

Recording critical Brocade DCX and SAN information

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

NOTE

Run **supportShow** , which includes most of the information in the following table and more. The customer should record the location of the .txt files, which are created by the customer in this procedure and are not called out in the **supportShow** results.

For detailed information about Fabric OS commands, refer to the *Fabric OS Command Reference Manual* . Use a checklist to ensure that all required information is recorded.

TABLE 15 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 Brocade DCX	
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 supportshow command		
	Location of "spptshow.txt" file	
	Notes regarding **supportshow** output	
Output from licenseshow command		
	License keys and other licensing data for licensed products enabled on device.	
Information about the new chassis		
	New factory serial number	
	New serial number (if available)	

1. Open a Telnet session and log in to the Brocade DCX as **admin**. The default password is *password*. Enable the logging function on your Telnet or serial console connection.

2. Back up the current configuration.

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

   - Enter **configUpload -all** ; then enter the requested information at the prompts.

   This command uploads the Brocade DCX configuration to the customer-defined FTP server, making it available for downloading. For more information about this command, refer to the *Brocade Fabric OS Command Reference*.

   ```
   switch:admin> configupload
   Protocol (scp or ftp) [ftp]: ftp
   Server Name or IP Address [host]: 123.123.123.123
   User Name [user]: Admin24
   File Name [config.txt]: config-switch0.txt
   Password:
   Upload complete
   switch:admin>
   ```

   - Alternatively, you can save the configuration file to a Brocade USB device.

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

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

4. Record the IP address information.

   Enter **ipAddrShow-sw**; then copy the command output into the config-miscinfo.txt file.

   ```
   switch:admin> ipaddrshow -sw
   SWITCH
   Ethernet IP Address: 10.32.50.12
   Ethernet Subnetmask: 255.55.0.0
   Fibre Channel IP Address: 1.2.3.4
   Fibre Channel Subnetmask: 255.255.255.0
   CP0
   Ethernet IP Address: 10.32.50.10
   Ethernet Subnetmask: 255.55.0.0
   HostName : cp0
   Gateway Address: 10.32.40.1
   CP1
   Ethernet IP Address: 10.32.50.11
   Ethernet Subnetmask: 255.55.0.0
   HostName : cp1
   Gateway Address: 10.32.40.1
   Backplane IP address of CP0 : 10.0.0.6
   Backplane IP address of CP1 : 10.0.0.7
   switch:admin>switch:admin>
   ```

5. Display and record the manufacturer serial numbers.

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

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

```
switch:admin> chassisshow
Chassis Backplane Revision: 1F
SW BLADE  Slot: 1
Header Version:         2
Power Consume Factor:   -50
Factory Part Num:       60-0001532-03
Factory Serial Num:     KP000000195
Manufacture:            Day:  1  Month:  1  Year: 2007
Update:                 Day: 14  Month:  3  Year: 2012
Time Alive:             187 days
Time Awake:             3 days
<output truncated>
CHASSIS/WWN  Unit: 1    (in same assembly as WWN Unit: 2)
Header Version:         2
Power Consume Factor:   -3
Factory Part Num:       60-0001501-07
Factory Serial Num:     FT02X805BE2
Manufacture:            Day: 26  Month:  3  Year: 2007
Update:                 Day: 14  Month:  3  Year: 2009
Time Alive:             207 days
Time Awake:             3 days
<output truncated>
switch:admin>
```

6. 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 Brocade DCX 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>
```

7. Enter **licenseShow**; 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
```

8. 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 Brocade DCX is restored to the fabric to verify that no unintentional changes have occurred to the fabric.

```
switch:admin> supportshow
version: 6.0.0
<output truncated>
switch:admin>
```

9. Record the cable connections between the Brocade DCX and the target device and ports (Cable routing table on page 135).

Disconnecting from network and fabric

1. Shut down the Brocade DCX using the **sysShutdown** command.

```
switch:admin> sysshutdown
This command will shutdown the operating systems on your switch.
You are required to power-cycle the switch in order to restore operation.
Are you sure you want to shutdown the switch [y/n]?y
HA is disabled
Stopping blade 1
Shutting down the blade....
Stopping blade 4
Shutting down the blade....
Stopping blade 10
Shutting down the blade....
Broadcast message from root (pts/1) Tue Jul 18 14:23:06 2006...
The system is going down for system halt NOW !!
```

DANGER
Turn off the power switches and disconnect the power cords.

2. Power off the chassis by flipping all AC power switches to the off position. (The power supply status LED should turn off.)
3. Remove the power cords from the power supplies and the power outlets.
4. Label the cables connected to all blades and record the connections in Cable routing table on page 135 and additional copies if necessary.
5. Remove the chassis door (Removal and replacement of the chassis door on page 83).

6. Disconnect the cables from the port blades and set them aside. The mSFP, SFP, SFP+, or XFP transceivers can be left in the port blades or removed.
7. Disconnect all cables from the CP8 and CR8 blades.
8. Disconnect any ICL cables.

Removing components from the chassis

ATTENTION

Follow electrostatic discharge (ESD) precautions when removing components. Wear a wrist grounding strap connected to chassis ground (if the device is plugged in) or a bench ground.

NOTE
Do not remove WWN cards from the chassis as new WWN cards are preinstalled in the replacement chassis. Do not replace the WWN cards in the replacement chassis with the old WWN cards as this will result in licensing and return materials authorization (RMA) issues for your product. The original license will be transferred to the replacement chassis, based on the license identification (LID) of the new, preinstalled WWN card, through the RMA process. You should be provided a license for the new chassis through email. If you have not received this, contact your Brocade support representative.

1. Remove the chassis door (Removal and replacement of the chassis door on page 83) if not already done.
2. Remove the cable management comb (Removal and replacement of the cable management comb on page 84).
3. Remove the port blades or filler panels (Removal and replacement of the port, application, and encryption blades on page 86 and Removal and replacement of the blade filler panel on page 89).
4. Remove the core switch blades (CR8) (Removal and replacement of the core switch blade (CR8) on page 97).
5. Remove the control processor blades (CP8) (Removal and replacement of the control processor blade (CP8) on page 91).
6. Remove the power supplies or filler panels (Removal and replacement of the power supply on page 100).
7. Remove the blower assemblies (Removal and replacement of the blower assembly on page 103).

Installing the replacement chassis

NOTE
Use safe lifting practices when moving the product. (C015)

ATTENTION
A fully populated Brocade DCX (eight FC8-64 port cards, 512 ports) weighs approximately 159.2 kg (351 lb) and requires a hydraulic or assisted lift to install it.

NOTE
If the Brocade DCX is installed in a cabinet, ensure that the cabinet is balanced and secured mechanically and that the removal and installation procedure will not compromise cabinet stability.

1. If the chassis is in a cabinet, remove it from the cabinet, remove the rack mount hardware, and save the hardware for use with the new chassis.
2. Place the chassis on a lift or on the shipping pallet provided with the original chassis.

3. Unpack the new chassis:
   a) Cut the bands that encircle the packaging.
   b) Remove the lid and the kits and foam from the top of the chassis.
   c) Lift the cardboard box off the chassis and remove the plastic bag from around the chassis.Save the packing materials for use when returning the old chassis.
   d) Leave the chassis on top of the plastic shipping tray if the chassis must be transported to the installation location.

   NOTE
   The Brocade DCX packaging does not incorporate a wood pallet and pallet brackets. The chassis sits on top of a plastic shipping tray.
4. Use a pallet jack or other assisted lift to transport the new chassis to the installation area. Doorways must be wider than 91 cm (36 in.) to accommodate the chassis on the pallet.
5. Use a lift to raise the chassis to the correct level. If installing the chassis in a cabinet, follow the instructions provided by the rack kit manufacturer.

Installing components into the new chassis

NOTE
Follow electrostatic discharge (ESD) precautions when installing new components. Wear a wrist grounding strap connected to chassis ground (if the device is plugged in) or a bench ground.

1. Record the chassis serial number, SKU, and WWN printed on the chassis label. This label is located on the lower right corner of the chassis on the port side.

   You may need this information to transfer licenses to the new chassis.
2. Replace the blower assemblies (Removal and replacement of the blower assembly on page 103).
3. Replace the power supplies or filler panels (Removal and replacement of the power supply on page 100).
4. Replace the control processor blades (CP8) (Removal and replacement of the control processor blade (CP8) on page 91).
5. Replace the core switch blades (CR8) (Removal and replacement of the core switch blade (CR8) on page 97).
6. If ICL cables are not used, insert EMI plugs in the ICL sockets in the core switch blades (CR8).
7. Replace the port blades or filler panels (Removal and replacement of the port, application, and encryption blades on page 86 and Removal and replacement of the blade filler panel on page 89).
8. Replace the cable management comb (Removal and replacement of the cable management comb on page 84).
9. Connect the power cords to the power supplies and the power outlets.
10. Replace the chassis door (Removal and replacement of the chassis door on page 83).
11. Power on the Brocade DCX (Providing power to the DCX Backbone on page 52).

    The Brocade DCX performs a power-on self-test (POST). The POST takes a minimum of three minutes and is complete when LED activity returns to standard state.
12. Verify that the Brocade DCX is powered on and POST is complete (all power LED indicators on the blades should be a steady green).
13. Verify that all components are functioning correctly by checking their LEDs. If the LEDs do not indicate correct operation, try reinstalling the corresponding component.

Downloading the configuration

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 Brocade DCX 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 *Brocade Fabric OS Command Reference*.

1. Log in to the Brocade DCX 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 **configDownload** command.

```
switch:admin> configdownload -all
Server Name or IP Address [host]: 123.123.123.123
User Name [None]: Admin24
File Name [config.txt]: config-switch.txt
Password: xxxxxxxx
download complete
switch:admin>
```

3. Reboot the DCX.

Verifying correct operation of system

1. Log in to the Brocade DCX as **admin**.

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

2. Enter the **slotShow -m** command and verify that all the installed cards are detected and that their status is operational (enabled).

```
switch:admin> slotShow -m
Slot   Blade Type   ID   Model Name   Status
-----------------------------------------
  1             AP BLADE             75         FX8-24               ENABLED
  2            AP BLADE             75         FX8-24               ENABLED
  3            SW BLADE             51         FC8-48               ENABLED
  4            UNKNOWN                                    VACANT
  5            CORE BLADE 52                 CR8               ENABLED
  6            CP BLADE   50                 CP8               ENABLED
  7            CP BLADE   50                 CP8               ENABLED
  8            CORE BLADE 52                 CR8               ENABLED
  9            SW BLADE   51                 FC8-48               ENABLED
  10            SW BLADE   51                 FC8-48               ENABLED
  11            SW BLADE   51                 FC8-48               ENABLED
  12            UNKNOWN                                    VACANT
switch:admin>
```

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

   This **switchShow** command displays Brocade DCX and port status information.

```
switch:admin> switchshow
switchName:     switch
switchType:     62.1
switchState:    Online
switchMode:     Native
switchRole:     Subordinate
switchDomain:   11
switchId:       fffc0b
switchWwn:      10:00:00:05:1e:39:59:67
zoning:         OFF
switchBeacon:   OFF
blade3 Beacon:  OFF
blade5 Beacon:  OFF
blade8 Beacon:  OFF
blade10Beacon:  OFF
Index            Slot        Port        Address            Media        Speed        State
Proto
==========================================================
    32        3        0        0b2000             id        N4        Online               L-Port 5
public
    33        3        1        0b2100             __        N8        No_Module
    34        3        2        0b2200             __        N8        No_Module
    35        3        3        0b2300             __        N8        No_Module
    36        3        4        0b2400             id        N4        Online               F-Port
10:00:00:00:c9:51:00:2d
    37        3        5        0b2500             __        N8        No_Module
switch:admin>
```

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: 10.32.50.12
Ethernet Subnetmask: 255.55.0.0
Fibre Channel IP Address: 1.2.3.4
Fibre Channel Subnetmask: 255.255.255.0
CP0
Ethernet IP Address: 10.32.50.10
Ethernet Subnetmask: 255.55.0.0
HostName : cp0
Gateway Address: 10.32.40.1
CP1
Ethernet IP Address: 10.32.50.11
Ethernet Subnetmask: 255.55.0.0
HostName : cp1
Gateway Address: 10.32.40.1
Backplane IP address of CP0 : 10.0.0.5
Backplane IP address of CP1 : 10.0.0.6
switch:admin>switch:admin>
```

Reconnecting the system to the network and fabric

See the cable routing information recorded in Cable routing table on page 135 for the following steps.

1. Connect the CP blades to the local area network.
   a) Insert the appropriate Ethernet cables into each Ethernet port.
   b) Connect the other ends to an Ethernet 10/100 Base-T LAN, if not already connected.

      NOTE
      The Brocade DCX can be accessed by remote connection using any of the available management tools, such as Telnet or Web Tools. Ensure that the Brocade DCX is not modified using other connections during the rest of this procedure.

2. Reconnect the transceivers and cables to the port blades:

      NOTE
      The ports and cables used in trunking groups must meet specific requirements. For a list of these requirements, refer to the*Brocade Fabric OS Administration 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 the above two sub-steps for the remaining ports.

      ATTENTION
      Do not route cables in front of the air exhaust vent (located on the upper port side of the chassis).

   d) Organize the cables as required.

Verifying correct configuration of the fabric

Copying the command outputs from this section into a file is recommended.

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-dcx-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 Brocade DCX or fabric:
   - If there are any mechanical problems, try reseating the associated component.
   - If the configuration information is not correct for the Brocade DCX, modify as required.
   - If other issues exist, contact your support provider.

Cable routing table

The following table is a 64-port template for a cable routing table. Make copies of the table to cover the total number of ports in the Brocade DCX.

TABLE 16 Cable routing table for Brocade DCX (64 ports shown)

Slot/port		Cable labels		Connected device	Slot/port of device
Slot	Port	Switch end	Device end		

TABLE 16 Cable routing table for Brocade DCX (64 ports shown) (continued)

Slot/port		Cable labels		Connected device	Slot/port of device
	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				
	32				
	33				
	34				
	35				
	36				
	37				
	38				
	39				
	40				

TABLE 16 Cable routing table for Brocade DCX (64 ports shown) (continued)

Slot/port		Cable labels		Connected device	Slot/port of device
	41				
	42				
	43				
	44				
	45				
	46				
	47				
	48				
	49				
	50				
	51				
	52				
	53				
	54				
	55				
	56				
	57				
	58				
	59				
	60				
	61				
	62				
	63				

Application and Encryption Blades

Introduction

This appendix provides details about the application and encryption blades that are available optionally for the Brocade DCX. Contact your Brocade DCX supplier for additional information.

FS8-18 blade

The FS8-18 encryption blade is a high performance 16 port auto-sensing blade with data cryptographic (encryption/decryption) and data compression capabilities designed for enterprises to secure their data against theft or unauthorized use and to compress tape data for maximum utilization of tape media. The encryption blade is a network-based solution that secures data-at-rest for heterogeneous tape drives, disk array LUNs, and virtual tape libraries.

The FS8-18 blade provides the following major features:

- 16 auto-sensing F, FL, E, EX, and M ports at 8 Gbps FC ports
- 16 SFP media interfaces
- Encryption engines
- Key management/generation
- Key management with these hardware interfaces:
  - Two 1000Base copper type media interfaces
  - One smart card interface
- Security supervisor tamper detection and response capability
- CC (Common Criteria) EAL-3 compliance

FX8-24 blade

The FX8-24 blade has 12 external Fibre Channel (FC) SFP ports supporting the Fibre Channel Routing Services and 10 external 1 Gigabit Ethernet (GbE or GE) SFP ports supporting the Fibre Channel over IP (FCIP) feature. There are also 2 licensable external 10 Gigabit Ethernet (10GbE or 10GE) SFP ports supporting FCIP. It operates with the Brocade Fabric Operating System and can communicate with another FX8-24 or a Brocade 7800 for both Fibre Channel Routing Services and FCIP, or a Brocade AP7420 for Fibre Channel Routing Services.The GbE ports on the FX8-24 are not compatible with the GbE ports on the FR4-18i blade or the Brocade 7500 switch.

NOTE

The port diagram on the front panel uses the abbreviations GE for 1 GbE ports and 10GE for 10 GbE ports.

The FX8-24 operates in one of three modes: 1) ten 1GbE ports, 2) ten 1GbE ports and one 10 GbE port, or 3) two 10 GbE ports depending on licensing and subsequent configuration of GbE port mode. If operating in 10GbE mode, the other end of the circuit must also be an FX8-24 operating in either 10GbE mode or dual mode with the corresponding VE_ports in 10GbE mode. All GbE ports on the blade can be configured to work with either copper or optical SFPs.

The FX8-24 blade is intended as a platform for FCIP and Fibre Channel Routing Services. Refer to the *Brocade Fabric OS Administration Guide* for information on configuring these features.

The FX8-24 blade provides the following hardware features:

- Twelve autosensing FC ports with link speeds of 1, 2, 4 or 8 Gbps
- Ten GbE ports supporting FCIP with fixed link speed at 1 Gbps
- Two 10 GbE ports (licensable) supporting FCIP with fixed link speed at 10 Gbps

The FX8-24 blade also provides the following functionality features:

- FCIP
- Compression (on FC frames before FCIP encapsulation)
- FC Routing (licensable)
- FCIP Trunking (licensable) with network-based failure recovery (failover only) and load balancing
- Multiple circuits per trunk:
  - Four per trunk through the GbE ports
  - Ten per trunk through the 10 GbE ports
- SO-TCP with reorder resistance
- FastWrite over FCIP
- Tape pipelining over FCIP
- FICON XRC emulation and tape pipelining over FCIP (licensable)
- FICON CUP (licensable)
- Virtual E_ports
- FCIP QoS
- Support for 200 ms RTT (on a limited number of GbE ports)
- Adaptive Rate Limiting (licensable)
- TCP performance graphing in Web Tools
- FCIP Tunnels:
  - A maximum of 10 FCIP Tunnels for all GbE ports.
  - Four tunnels maximum per GbE port.
  - Two 10 GbE ports can support up to ten FCIP tunnels each.
  - Each FCIP tunnel is represented and managed as a virtual Fibre Channel E_Port.
  - Fibre Channel Routing Services can be used over the FCIP link.
  - The Link Cost is equal to the sum of all established/low metric (or currently active) circuits' MAX rates in the tunnel.
  - Fabrics connected through FCIP merge if the ports are configured as VE_Ports, and do not merge if they are configured as VEX_Ports. If VE_Ports are used in a Fibre Channel Routing Services backbone fabric configuration, then the backbone fabric merges, but the EX_Port-attached edge fabrics do not merge. For more information refer to the *Brocade Fabric OS Administration Guide*.
- Up to three FC trunking groups. The three groups are defined as:
  - Trunk group 0: FC ports 0, 1
  - Trunk group 1: FC ports 6, 7

- Trunk group 2: FC ports 2, 3, 4, 5, 8, 9, 10, 11

A RoHS-compliant version of the FX8-24 blade is available. To determine if this blade is installed, enter the **chassisshow** command. Output for the Factory Part Number will be 60-1003135-XX. Downgrading to these FOS versions is also not recommended if this blade is installed.

FCOE10-24 blade

The FCOE10-24 blade has 24 Fibre Channel over Ethernet (FCoE) ports that enable the transmission of FC frames over an Ethernet network via encapsulation in standard Ethernet packets. This is enabled by adherence to Converged Enhanced Ethernet (CEE) standards, a low latency, lossless Ethernet standard. This does not require dedicated Ethernet lines, but rather can make use of existing Ethernet infrastructure to reduce costs.

NOTE
This blade cannot be used in the same chassis with an FC8-48E, FC8-64, FC16-48, FC16-64 port blades or any of the application blades (FX8-24).

The FCOE10-24 blade supports only optical cabling and transceivers (SFP+).

There are no licensing requirements for functionality on this blade.

The FCOE10-24 blade provides the following hardware features:

- 24 FCoE ports operating at 10 Gbps
- 32 FC ports operating at 8 Gbps through the backplane
- Hot pluggable
- I^2C Management interface through the backplane
- JTAG support
- Blade power and status LEDs
- Link status LEDs per port

The FCOE10-24 blade also provides the following functionality features:

- FCoE switching
- CEE switching
- Layer 2 Ethernet protocols STP/MSTP/RSTP, 802.1q, and Link Aggregation (802.1ad)
- Standard Ethernet encapsulation
- End of row deployment

NOTE
With the switch in online state, if all the FCOE ports are shutdown, offline diags will continue to run. After this, the blade will be in inoperable state and you need to issue **slotpoweroff** and **slotpoweron** to recover.

Refer to the *Brocade Fabric OS Administration Guide* for information on configuring these features.

Diagnostics and Troubleshooting

Introduction

For information about troubleshooting the entire fabric, refer to the *Fabric OS Troubleshooting and Diagnostics Guide*.

The Brocade DCX includes a number of diagnostic aids to assist with troubleshooting, including LEDs on the hardware, commands that display current status, diagnostic tests for hardware and software, and error messages. In addition, a number of managing and monitoring features are available, such as Fabric Manager, Web Tools, Fabric Watch, and Advanced Performance Monitoring.

If the Brocade DCX does not operate as expected, the following steps can be taken to diagnose the problem:

- Check the LEDs and see the LED tables (Monitoring System Components on page 63) for interpretation and recommended actions.
- Review the results of the last POST run by the Brocade DCX (Interpreting POST and boot results on page 144).
- Review the error logs. (Refer to the *Fabric OS Troubleshooting and Diagnostics Guide* for more information).
  - Review RASlog entries.
  - Type the **sensorShow** command to determine the status of the hardware components.
  - Run diagnostic tests (Diagnostics on page 145).
  - Reboot the Brocade DCX or power the entire chassis off and then on (Powering off the Brocade DCX on page 147 and Providing power to the DCX Backbone on page 52).

If the problem is still unresolved after these steps, contact your support provider. The information required by your support provider is listed under Contacting Brocade Technical Support on page 11.

Obtaining chassis and component status

The CLI commands in the following table provide status and environmental information about the chassis and its components. These commands provide information only, and they do not interrupt traffic flow. For more information about these commands, refer to the *Brocade Fabric OS Command Reference*.

TABLE 17 Environmental status and maintenance commands

Command	Information displayed
sensorShow	Temperature readings for the port blades
	Temperature readings for the CP blades
	Status and RPM of all operational fans
	Status of all operational power supplies
tempShow	Temperature readings for the port blades
	Temperature readings for the CP blades

TABLE 17 Environmental status and maintenance commands (continued)

Command	Information displayed
psShow	Status of all operational power supplies
fanShow	Status and RPM of all operational fans
chassisShow	Serial number, time awake, and additional information about each component
slotShow	Slot occupancy
errShowerrDump	System error log. Refer to the *Brocade Fabric OS Message Reference* for more information on the messages in this log.

Interpreting POST and boot results

The Brocade DCX performs Power-On Self-Test (POST) by default each time the chassis is powered on, rebooted, or reset. The Brocade DCX can be rebooted using the **reboot** (to reboot each CP individually) or **fastBoot** commands. The **fastBoot** command reboots the switches without running POST. If the active CP blade is rebooted, it fails over to the standby CP blade.

POST

The Brocade DCX automatically performs POST each time it is powered on or reset.

To verify that POST has completed without error:

- Verify that all LEDs return to a normal state after POST completes (Monitoring System Components on page 63).

  If one or more LEDs do not return to a normal state, and this is not due to the Brocade DCX being set to beacon, refer to the relevant LED table to identify and correct the problem. For port blades, and CP and core switch blades, the **slotShow** command can be used to check the status of the slots. For information about turning beaconing on or off, refer to the *Brocade Fabric OS Administration Guide*.
- Verify that the switch prompt displays when POST completes.

  If it does not display, POST was not successfully completed. Contact the Brocade DCX supplier for support.
- Review the system error log using the **errShow** or **errDump** commands.

  Any errors detected during POST are written to the system log, which is accessible through the **errShow** command. For information about error messages, refer to the *Brocade Fabric OS Message Reference*.

POST includes the following steps:

1. Preliminary POST diagnostics are run.
2. Operating system is initialized.
3. Hardware is initialized.
4. Diagnostic tests are run on several functions, including circuitry, port functionality, ability to send and receive frames, all aspects of memory, parity, statistics counters, and serialization.

Boot

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

1. Universal port configuration is performed.
2. Links are initialized.

3. Fabric is analyzed. If any ports are connected to other switches, the Brocade DCX participates in a fabric configuration.
4. The Brocade DCX obtains a domain ID and assigns port addresses.
5. Unicast routing tables are constructed.
6. Normal port operation is enabled.

Diagnostics

Diagnostic tests are automatically run during POST to check the status of the Brocade DCX. Any error messages generated during POST are sent to the error logs and to the serial console, if connected.

Diagnostic tests can also be run manually to test and troubleshoot the hardware and the firmware, including internal connections and circuitry, transceivers, and port cables. However, diagnostic tests are generally intended for use by support personnel.

> NOTE
> Error messages do not necessarily indicate that the Brocade DCX requires maintenance.

Each diagnostic test can be implemented by entering the related command through a Telnet or serial session. For a list of diagnostic tests and commands, refer to the*Brocade Fabric OS Administration Guide*

All diagnostic tests are run at link speeds of 1, 2, 4, and 8 Gbps. They might temporarily lock the transmit and receive speeds to a specific speed. Some diagnostic tests require interconnecting the ports to each other or using loopback plugs. If ports are interconnected, the media (cables and transceivers) at each end of the connection must be of the same type. For example, short wavelength media must be connected to short wavelength media, and likewise with long wavelength media and copper media.

For more information about diagnostic tests and how to run them, refer to the *Brocade Fabric OS Administration Guide* and the *Brocade Fabric OS Command Reference*. For information about system error messages (**errShow** or **errDump**), refer to the *Fabric OS Troubleshooting and Diagnostics Guide* .

Troubleshooting

The following table provides a list of issues, possible causes, and recommended actions.

TABLE 18 Troubleshooting the Brocade DCX

Issue	Possible cause	Recommended action
Entire chassis powers off automatically.	Power supplies are inadequate to support the installed components.	Add an additional power supply.
Several or all components are not operating.	One or both power cables may not be connected to a live source.	Ensure that both power cables are connected to live outlets.
	One or both AC power switches might be off.	Ensure that both AC power switches are on (AC switches light up green when on).
Serial connection is faulty or serial port logs have incorrect or missing information.	Serial cable is not connected correctly.	Ensure that the cable is firmly connected to workstation computer and to the Brocade DCX.
	Terminal emulator application parameters are not set correctly.	Ensure that the terminal emulator application is configured as follows: 9600 bits per second, 8 databits, no parity, 1 stop bit, no flow control.
	Serial port might be incompatible (only RS-232 is supported).	Ensure that the Brocade DCX is connected to an RS-232 port. RS-423 serial ports might experience difficulties due to corner-case incompatibilities of the standards.

TABLE 18 Troubleshooting the Brocade DCX (continued)

Issue	Possible cause	Recommended action
	Pins on the serial cable or serial port might be damaged.	Remove the cable and inspect the pins on the cable and in the serial port. Do not reinstall if the pins on either component have any visible damage, as this could damage the pins on the other component. Replace the components as required.
CP Ethernet link speed is different than expected or a link cannot be established.	There might be a conflict with the CP Ethernet link speed negotiation set up by the network.	Specify the CP Ethernet link speed by entering the **ifModeSet** command. For more information about Ethernet connectivity to the Brocade DCX, refer to the LAN guidelines provided through the MyBrocade Web site.
Configuration data is inaccurate or cannot be accessed.	Chassis was powered off/on while a WWN card was uninstalled or failed.	Install an operational WWN card and power the system off/on again.
	The Brocade DCX was rebooted while a WWN card was uninstalled or failed.	
Initial set up results in IP address/Domain ID conflict.	The Brocade DCX was connected to the fabric before being configured.	See Logging In and Configuring the DCX Backbone on page 51 and the *Brocade Fabric OS Administration Guide* for configuration information.
LEDs on one or more components are changing rapidly or do not indicate a healthy state.	The Brocade DCX might be booting or running POST.	Verify that boot and POST are complete. The Brocade DCX requires a minimum of 3 minutes, usually, after power-on to complete POST.
	Beaconing might be on for the entire Brocade DCX or for individual components.	Determine whether beaconing is on by entering the **switchShow** command and determine whether switch beaconing or blade beaconing is on.
	Individual components might have failed.	See the LED tables in Monitoring System Components on page 63 for interpretation and recommended actions.
	Pins on the components might be damaged.	Remove the component from the chassis and inspect the pins on the component and inside the chassis. Do not reinstall if pins on either component are damaged, as this could damage pins on other components. Replace the parts as required.
None of the LEDs on a component are on.	Component might not be seated correctly.	Ensure that the Brocade DCX has power and the component is firmly seated. If the problem continues, enter the **sensorShow** command to determine the component status. If the component is a CP blade or port blade, enter the **slotShow** command to determine the status.
	Component might have failed.	Replace the component as necessary.
CP blades are failing over frequently.	A third-party application has a memory leak.	Check application for memory leaks.
	There is excessive serial port activity.	Ensure that the serial port activity remains below specified amount.
	CP blade is attached to an Ethernet with high traffic loads.	Ensure that the Ethernet traffic remains below specified amount
	Chassis is overheated.	Enter the **tempshow** and **sensorShow** commands to check internal temperature. If components are overheating, shut down port blades as necessary to return the temperature to operating range.

TABLE 18 Troubleshooting the Brocade DCX (continued)

Issue	Possible cause	Recommended action
One or more port blades have either shut down or failed POST as indicated by the error log.	Blades might be overheated.	Enter the **sensorShow** command to check the internal temperature readings. If components are overheating, shut down port blades as necessary to return the temperature readings to the operating ranges.
	Blades might be faulty.	Enter the **slotShow** command to determine status. For more information, enter the **diagDisablePost** command; then, use the **slotPowerOff** [*slot number*] and **slotPowerOn** [*slot number*] command. Resolve the source of the problem or replace the blade as required.
	Pins on the blade or the backplane might be damaged.	Remove the blade from the chassis and inspect the pins on the blade and on the backplane inside the slot. Do not reinstall if the pins on either component are damaged, as this could damage pins on other components. Replace the components as required.
An individual component is not operating as expected.	Component may not have power or may not be firmly seated.	Ensure that the component is receiving power (power LED should be on) and the component is firmly seated.
	Pins on the component or the backplane might be damaged.	Remove the component from the chassis and inspect the pins on the blade and inside the chassis. Do not reinstall if the pins on either component are damaged, as this could damage pins on other components. Replace parts as required.
	The component might have failed.	Enter the **tempshow** and **sensorShow** commands to determine the component status. If the component is a CP blade or port blade, enter the **slotShow** command to determine the status. Replace the component as necessary

Powering off the Brocade DCX

To power off the Brocade DCX:

1. Shut down the Brocade DCX using the **sysShutdown** command.

```
switch::admin> sysshutdown
This command will shutdown the operating systems on your switch.
You are required to power-cycle the switch in order to restore operation.
Are you sure you want to shutdown the switch [y/n]?y
HA is disabled
Stopping blade 1
Shutting down the blade....
Stopping blade 4
Shutting down the blade....
Stopping blade 10
Shutting down the blade....
Broadcast message from root (pts/1) Tue Jul 18 14:23:06 2006...
The system is going down for system halt NOW !!
```

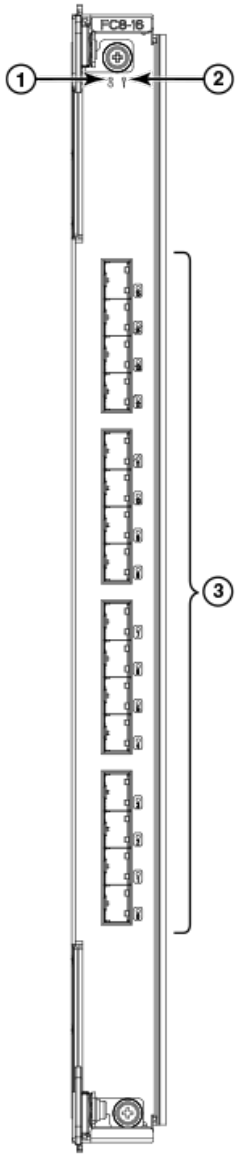
2. Power off the chassis by flipping all AC power switches on the power supplies to the off position (LEDs inside AC power switches should turn off). To maintain the ground connections, leave power cords connected to the power supplies and to the electrical outlets.

Port Numbering Template

Print or copy the following templates in this appendix and use them to document the port numbering pattern for the Brocade DCX. These templates show the following components:

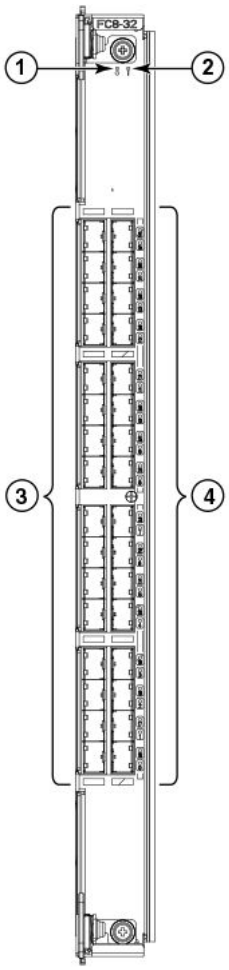
- FC8-16 port blade (Figure 49)
- FC8-32 port blade (Figure 50)
- FC8-48 port blade (Figure 51)
- FC8-64 high density port blade (Figure 52)
- FS8-18 encryption blade (Figure 53)
- FX8-24 extension blade (Figure 54)
- FCOE10-24 FCoE blade (Figure 55)

FIGURE 49 FC8-16 port blade



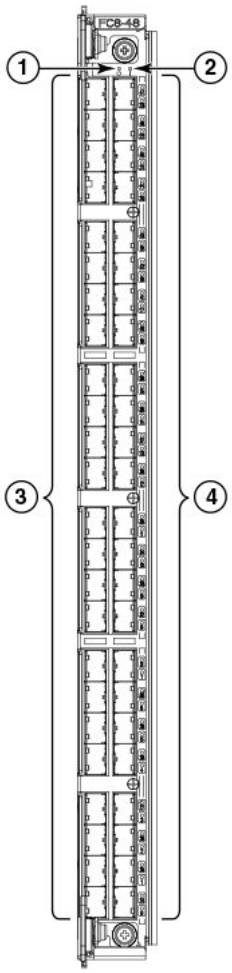
1. Blade Power LED
2. Blade Status LED
3. FC ports 0-15 (bottom to top)

FIGURE 50 FC8-32 port blade



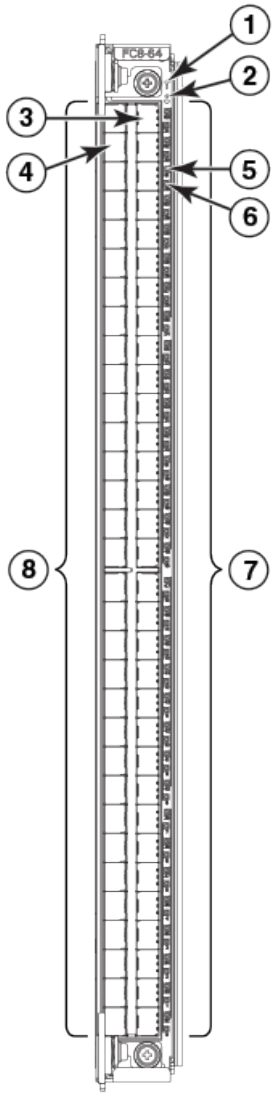
1. Blade Power LED
2. Blade Status LED
3. FC ports 0-15 (bottom to top)
4. FC ports 16-31 (bottom to top)

FIGURE 51 FC8-48 port blade



1. Blade Power LED
2. Blade Status LED
3. FC ports 0-23 (bottom to top)
4. FC ports 24-47 (bottom to top)

FIGURE 52 FC8-64 port blade



1. Blade Status LED
2. Blade Power LED
3. Port 63
4. Port 30
5. port 61 LED
6. port 29 LED
7. FC ports 32-63 (bottom to top)
8. FC ports 0-31 (bottom to top)

FIGURE 53 FS8-18 encryption blades

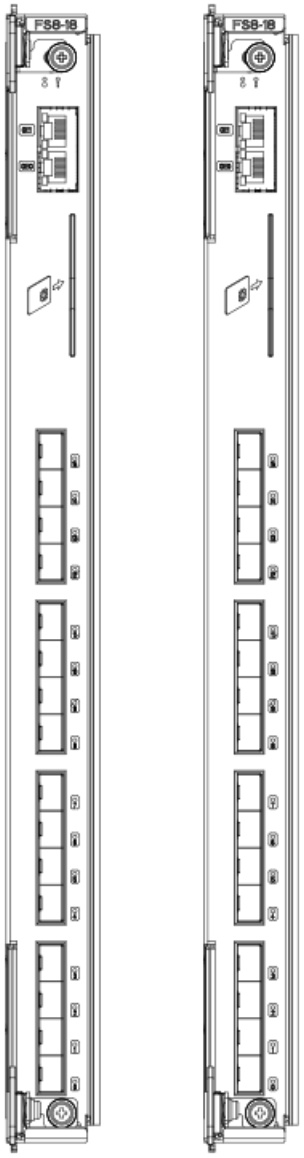
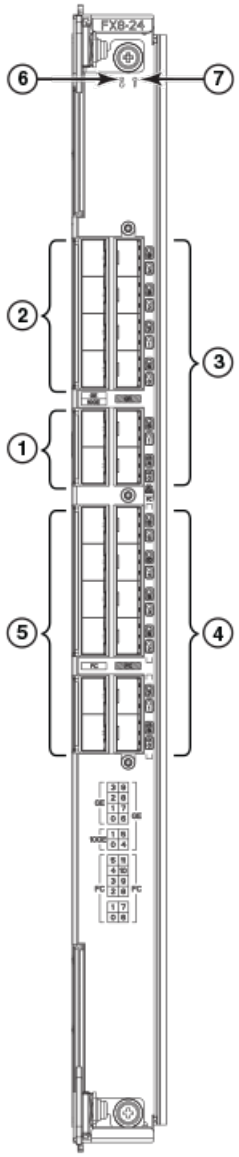
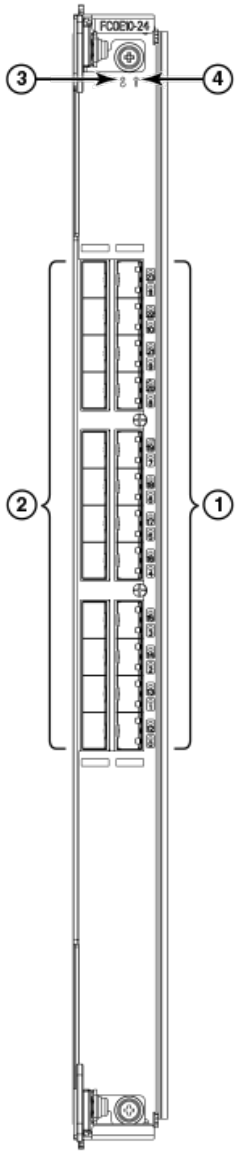


FIGURE 54 FX8-24 extension blade



1. 10 GbE ports 0-1
2. 1 GbE ports 0-3
3. 1 GbE ports 4-9
4. FC ports 6-11
5. FC ports 0-5
6. Blade Power LED
7. Blade Status LED

FIGURE 55 FCOE10-24 FCoE blade



1. 10-GbE CEE ports 12-23
2. 10-GbE CEE ports 0-11
3. Power LED
4. Status LED

Regulatory Statements

BSMI statement (Taiwan)

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

Warning:

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

Canadian requirements

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

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

CE statement

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

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

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

China ROHS

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

FCC warning (US only)

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

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

KCC statement (Republic of Korea)

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

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

VCCI statement

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

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

Brocade DCX Backbone Technical Specifications

This document highlights the features and specifications for the Brocade DCX Backbone.

System specifications

System component	Description
Enclosure	14U, rack-mountable chassis in a standard 19-inch EIA cabinet
Power inlet	C20
Power supplies	Two 2000 W AC power supply modules (100-240 VAC auto-sensing), 2N redundancy
Fans	Three blower assembly modules (two required for operation)
Cooling	Rear panel-to-door airflow
System architecture	8 Gbps Fibre Channel modular network switching platforms
System processors	FreeScale 8548, 1.2 GHz

Fibre Channel

System component	Description
Fibre Channel ports	Up to 512 ports, universal (E_Port, F_Port, FL_Port, Ex_Port, and M_Port)
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signalling Interface standard)
Modes of operation	Fibre Channel Class 2, Class 3, and Class F
Fabric initialization	Complies with FC-SW 5.0
FCIP (IP over Fibre Channel)	Complies with FC-IP 2.3 of the FCA profile

LEDs

System component	Description
Status	Indicates the blade activity and status.
Power	Indicates whether the device is powered on correctly.
Port	Indicates the port speed and activity.
Link	Indicates whether the inter-chassis link (ICL) cable is correctly installed.
ATTN	Indicates whether the blade requires attention.

Other

System component	Description
Serial cable	RS-232 serial cable
RJ-45 to DB9 adapter	RS-232 cable has an adapter at one end that can be removed to provide an RJ-45 style connector
RJ-45 connector	Serial port 10/100/1000 Ethernet (RJ-45) per control processor

Weight and physical dimensions

Fully loaded: Brocade DCX Backbone 512-port configuration with eight FC8-64 port blades.

Model	Height	Width	Depth	Weight (empty)	Weight (fully loaded)
Brocade DCX	61.24 cm 24.11 in	43.74 cm 17.22 in	Without door: 61.19 cm, 24.09 in With door: 73.20 cm, 28.82 in	39.55 kg 87.20 lb	159.20 kg 351 lb

Environmental requirements

Condition	Operational	Non-operational
Ambient temperature	0°C to 40°C (32°F to 104°F)	-25°C to 70°C (-13°F to 158°F)
Relative humidity (non-condensing)	20% to 85% at 40°C (104°F)	10% to 93% at 70°C (158°F)
Altitude (above sea level)	0-3000 meters (10,000 feet)	0 to 12,000 meters (40,000 feet)
Shock	20 G, 6 ms, half-sine wave	33 G, 11 ms, half-sine wave
Vibration	0.5 G p-p, 5 to 500 Hz	2.0 G p-p, 5 to 500 Hz
Airflow	595 cmh (350 cfm)	N/A
Heat dissipation	Minimum 16-port configuration of 825.3 W, 2814 BTU/hr Maximum 512-port configuration of 1930.1 W, 6582 BTU/hr (200 V)	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-DCX-0104	1000/2000 W	1000 W Output 100 - 120 V (nominal) 85 - 132 V (range) 2000 W Output 200 - 240 V (nominal)	50/60 Hz (nominal) 47 - 63 Hz (range)	15 A	Line & Neutral Fused	20 A maximum, peak

Power supply model	Maximum output power rating (DC)	Input voltage	Input line frequency	Maximum input current	Input line protection	Maximum inrush current
		180 - 264 V (range)				

Power consumption (maximum configuration)

The power specifications in the following table are calculated for fully loaded systems with four power supplies, eight FC8-48 port blades, two CP8 blades, two CR8 blades, and three blower assemblies.

Model name	@100 VAC input	@200 VAC input	@-48 VDC input	Minimum number of power supplies	Notes
XBR-DCX-0104	20 A 1999 W 6817 BTU/hr	5.5 A 1100.7 W 3753 BTU/hr	N/A	2	With an AC input of 100-120 V, four power supplies are required for redundancy. With an AC input of 200-240 V input, two power supplies are required for redundancy.

Data port specifications (Fibre Channel)

Name	Number	Description
Brocade DCX	512	Up to eight hot-swappable port blade assemblies that can be configured in a single chassis, delivering up to 512 Fibre Channel ports.

Fibre Channel data transmission ranges

Port speed (Gbps)	Cable size (microns)	Short wavelength (SWL)	Long wavelength (LWL)	Extended long wavelength (ELWL)
1	50	500 m (1,640 ft) (OM2) 860 m (2,821 ft) (OM3)	N/A	N/A
	62.5	300 m (984 ft)	N/A	N/A
	9	N/A	N/A	N/A
2	50	300 m (984 ft) (OM2) 500 m (1,640 ft) (OM3)	N/A	N/A
	62.5	150 m (492 ft)	N/A	N/A
	9	N/A	30 km (18.6 miles)	N/A
4	50	150 m (492 ft) (OM2) 380 m (1,246 ft) (OM3)	N/A	N/A
	62.5	70 m (230 ft)	N/A	N/A

Port speed (Gbps)	Cable size (microns)	Short wavelength (SWL)	Long wavelength (LWL)	Extended long wavelength (ELWL)
	9	N/A	30 km (18.6 miles)	N/A
8	50	50 m (164 ft) (OM2) 150 m (492 ft) (OM3)	N/A	N/A
	62.5	21 m (69 ft)	N/A	N/A
	9	N/A	N/A	N/A
10	50	300 m (984 ft) (OM3)	N/A	N/A
	62.5	N/A	N/A	N/A
	9	N/A	10 km (6.2 miles)	40 km (24.8 miles)

Serial port specifications (DB9)

Pin	Signal	Description
1	Reserved	Reserved
2	TXD (output)	Transmit data
3	RXD (input)	Receive data
4	Reserved	Reserved
5	GND	Logic ground
6	Reserved	Reserved
7	Reserved	Reserved
8	Reserved	Reserved
9	Reserved	Reserved

Serial port specifications (pinout mini-USB)

Pin	Signal	Description
1	+5V	Not used
2	UART0_TX	Debug port
3	UART0_RX	Console port
4	IN	Not used
5	GND	Ground

Serial port specifications (pinout RJ-45)

Pin	Signal	Description
1	Not supported	N/A
2	Not supported	N/A
3	UART1_RXD	Receive data
4	GND	Logic ground

Pin	Signal	Description
5	GND	Logic ground
6	UART1_TXD	Transmit data
7	Not supported	N/A
8	Not supported	N/A

Serial port specifications (protocol)

Parameter	Value
Baud	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

Regulatory compliance (EMC)

- FCC Part 15, Subpart B (Class A)
- EN 55022 (CE mark) (Class A)
- EN 55024 (CE mark) (Immunity) for Information Technology Equipment
- ICES-003 (Canada) (Class A)
- AS/NZ 55022 (Australia) (Class A)
- VCCI (Japan) (Class A)
- EN 61000-3-2
- EN 61000-3-3
- EN 61000-6-1

Regulatory compliance (safety)

- CAN/CSA-C22.2 No. 60950/UL 60950
- EN 60825 Safety of Laser Products
- EN 60950/IEC 60950 Safety of Information Technology Equipment

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).

Caution and Danger Notices

Cautions

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

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

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

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

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

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

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

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

CAUTION
Never leave tools inside the chassis.

VORSICHT	Lassen Sie keine Werkzeuge im Chassis zurück.
MISE EN GARDE	Ne laissez jamais d'outils à l'intérieur du châssis
PRECAUCIÓN	No deje nunca herramientas en el interior del chasis.

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.

VORSICHT	Alle Geräte mit Wechselstromquellen sind nur zur Installation in Sperrbereichen bestimmt. Ein Sperrbereich ist ein Ort, zu dem nur Wartungspersonal mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer anderen Schutzvorrichtung Zugang hat.
MISE EN GARDE	Pour éviter d'endommager le châssis et les composants, ne jamais tenter de soulever le châssis par les poignées du ventilateur ou de l'alimentation. Ces poignées n'ont pas été conçues pour supporter le poids du châssis.
PRECAUCIÓN	Para prevenir daños al chasis y a los componentes, nunca intente levantar el chasis usando las asas de la fuente de alimentación o del ventilador. Tales asas no han sido diseñadas para soportar el peso del chasis.

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.

VORSICHT	Verwenden Sie nicht die Laschen der Anschlussabdeckungen um ein Modul anzuheben. Diese sind nicht auf das Gewicht des Moduls ausgelegt, welches herunterfallen und dabei beschädigt werden kann.
MISE EN GARDE	N'utilisez pas les languettes du boîtier du port pour soulever le module. Elles ne sont pas conçues pour supporter le poids du module, qui peut tomber et être endommagé.
PRECAUCIÓN	No utilice las pestañas de la tapa del puerto para levantar el módulo. No están diseñadas para soportar el peso del módulo, por lo que este podría caerse y resultar dañado.

Danger notices

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

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

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

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

DANGER

Use safe lifting practices when moving the product.

GEFAHR	Beim Bewegen des Produktes ist auf eine sichere Hubtechnik zu achten.
DANGER	Utiliser des techniques de levage sûres pour déplacer le produit.
PELIGRO	Tenga mucho cuidado al levantar el producto para moverlo

DANGER

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

GEFAHR	Dieses System ist möglicherweise mit mehr als einem Netzkabel ausgestattet. Trennen Sie stets die Verbindung aller Netzkabel, bevor Sie Wartungsarbeiten durchführen, um dieGefahr eines Stromschlags auszuschließen.
DANGER	Ce commutateur peut comporter plusieurs cordons d'alimentation. Pour réduire les risques de choc électrique, déconnectez tous les cordons d'alimentation avant d'effectuerl'entretien de l'appareil.

PELIGRO	Este conmutador podría tener más de un cable de alimentación. Para reducir el riesgo de sufrir una descarga eléctrica, desconecte todos los cables de alimentación antes de proceder con la reparación.

DANGER

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

GEFAHR	Aus Sicherheitsgründen sollte ein EGB-Armband zum Schutz von elektronischen gefährdeten Bauelementen mit einem 1 Megaohm-Reihenwiderstand ausgestattet sein.
DANGER	Pour des raisons de sécurité, la dragonne ESD doit contenir une résistance de série 1 méga ohm.
PELIGRO	Por razones de seguridad, la correa de muñeca ESD deberá contener un resistor en serie de 1 mega ohmio.

DANGER

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

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

DANGER

Turn off the power switches and disconnect the power cords.

GEFAHR	Netzschalter ausschalten und Netzkabel abziehen.
DANGER	Mettre les interrupteurs hors tension et débrancher les câbles d'alimentation.
PELIGRO	Apague los interruptores de alimentación y desconecte los cables de alimentación