Brocade FCoE Switch Module for IBM BladeCenter

Installation and User's Guide

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Note: Before using this information and the product it supports, read the general information in the *IBM Warranty and Support Guide* and the *IBM Safety Information* and the *IBM Systems Environmental Notices and User Guide* on the IBM *Documentation* CD.

First Edition (April 2010)

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się
z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по
технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

Each caution and danger statement in this document is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

For example, if a caution statement is labeled “Statement 1,” translations for that caution statement are in the *Safety Information* document under “Statement 1.”

Be sure to read all caution and danger statements in this document before you perform the procedures. Read any additional safety information that comes with the server or optional device before you install the device.

This device is intended for use with UL Listed IBM BladeCenters.

Statement 1:

DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.

- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

To Connect:	To Disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors..	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON	

Statement 2:

CAUTION:

When replacing the lithium battery, use only IBM® Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it with only the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- Throw or immerse into water
- Heat to more than 100° C (212° F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3:

CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following. Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil A` Laser de Classe 1

Statement 8:

CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Chapter 1. Introducing the Brocade FCoE Switch Module

This *Installation and User's Guide* contains the following instructions and information:

- Installing, removing, and replacing the high speed switch module
- Enabling the high speed switch module and its external ports
- Using the information panel, LEDs, and external ports on the high speed switch module
- Configuring the high speed switch module through a Telnet interface
- Configuring the high speed switch module through a Web browser interface
- Upgrading and expanding the functionality of the high speed switch module
- Performing basic troubleshooting tasks and solving problems with the high speed switch module
- Getting help, service, and technical assistance

Important: This product is not intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks.

Notes:

1. Throughout this document, including the references to screen contents, the Brocade FCoE Switch Module is generically referred to as the high speed switch module, HSSM, or the switch module. With respect to certain screen contents or titles, a high speed switch module might be referred to as a switch module or switch, because the term *switch module* or *switch* appears on those screens.
2. Unless otherwise stated, references to the BladeCenter unit apply to all BladeCenter units that support the I/O module. As of the date of this document, the following devices are examples of applicable BladeCenter units:
   - BladeCenter H unit
   - BladeCenter HT unit
3. Unless otherwise stated, references to the blade server apply to all blade servers that support the high speed switch module and expansion card.
4. The illustrations in this document might differ slightly from your hardware.
5. The screens that are described or referenced in this document might differ slightly from the screens that are displayed by your system. Screen content varies according to the type of BladeCenter unit and the firmware versions and options that are installed.
6. Unless otherwise stated, references to the management module apply only to the BladeCenter Advanced Management Module, which is the only type of management module that supports the Brocade FCoE Switch Module.

Components

The Brocade FCoE Switch Module has the following components:

- Fourteen internal autonegotiating (1 Gbps to 10 Gbps) CEE ports, one connected to each of the blade servers in the BladeCenter H unit (twelve internal ports in the BladeCenter HT chassis)

- Two internal 100 Mb Ethernet ports to connect to the management module
- Up to eight external 10 Gbps CEE ports for connecting small-form-factor pluggable (SFP+) modules
- Up to eight external autosensing (2 Gbps, 4 Gbps, or 8 Gbps) Fibre Channel ports for connecting SFP+ modules
- One external RS232 console port with a mini-USB interface for serial console management
- One external 10/100/1000 Mb RJ45 Ethernet copper port for debugging and field support

Dynamic Ports on Demand

The base version of the Brocade FCoE Switch Module ships with 16 licensed ports. Port activation is through a process called Dynamic Ports on Demand (DPOD).

With DPOD, ports are licensed as they come online. In the base port set, two external CEE ports (ports 15 and 16) are pre-licensed. The remaining 14 ports (on a first-come, first-served basis) are assigned licenses. These 16 ports may be any combination of external CEE ports, FC ports, or internal CEE ports. Once all the licenses have been assigned, you can manually move those licenses from one port to another if you choose.

Additional Ports on Demand (POD) licenses can be purchased. You can purchase the IBM POD upgrade option to license the additional 14 ports. All internal and external ports will then be licensed and can be used.

NOTE
The POD upgrade option actually includes a bundle of two POD licenses (for eight and six ports) for a total of 14 ports. After installing the POD upgrade option, if the user then performs a **licenseShow** command, two POD licenses (Single POD and Double POD) will be listed. This is expected behavior.

CAUTION

Once installed, POD licenses should NOT be removed, since ports in use could be disabled and I/O traffic disrupted.

In the unlikely event that a POD license is removed, the following behavior occurs:

- The first sixteen ports licensed are associated with the base port set and these ports will maintain their licenses.
- Upon removal of the first installed POD license, the ports associated with that POD license will be disabled (this may be either eight or six ports).
- Upon removal of the second installed POD license, the ports associated with that POD license will be disabled (this may be either eight or six ports).
- Upon removal of the both installed POD licenses, all 14 ports not included in the base 16 ports will be disabled.

Switch management

You can manage and configure the Brocade FCoE Switch Module through multiple interfaces:

- A Telnet connection to the command-line interface (CLI)

- A terminal emulation program connection to the mini-USB port interface
- A Web browser-based interface (Brocade Web Tools) connection to the switch module
- The IBM Chassis Advanced Management Module (AMM)

For more information, see "Chapter 6. Configuring the switch module".

Additional information

Your high speed switch comes with a one-year limited warranty. For information about your warranty, see the IBM *Warranty and Support Information* document on the IBM Documentation CD. You can obtain up-to-date information about your high speed switch and other IBM server products at http://www.ibm.com/systems/x/.

Record information about the switch module in the following table. The product name and serial number are on the identification label on the bottom cover of the switch module. The media access control (MAC) address is on a separate label on the bottom cover of the switch module. For an illustration that shows the locations of these labels, see "Major components of the switch module" on page 5. You will need this information when you register the switch module with IBM. You can register the switch module at http://www.ibm.com/support/mysupport/.

TABLE 1

Brocade FCoE Switch Module	Numbers
Model number	
Serial number	
Part number	
Media Access Control (MAC) address for switch module	
MAC addresses for other components	

Related documentation

This *Installation Guide* contains setup and installation instructions for the switch module and general information about the switch module, including getting started, how to configure the switch module, and how to get help.

Notes:

- The most recent versions of this *Installation Guide* and all other BladeCenter documentation are at http://www.ibm.com/systems/support/.
- Depending on your blade server model, additional documentation might be included on the IBM *BladeCenter Documentation* CD for the IBM BladeCenter unit.

The following related documentation is available at http://www.ibm.com/systems/support/:

- BladeCenter *Problem Determination and Service Guide*
- BladeCenter *Hardware Maintenance Manual and Troubleshooting Guide*
- *BladeCenter Advanced Management Module Installation Guide*
- *IBM BladeCenter Advanced Management Module Command-Line Interface Reference* Guide

- IBM BladeCenter Advanced Management Module User's Guide
- *Installation and User's Guide* for the BladeCenter unit
- Safety Information

Brocade documentation

The following related Brocade Communications Systems, Inc. documentation is available from the main Brocade Communications Systems, Inc. Web site, http://www.brocade.com/. Additional related documentation also is available from this Web site. See this Web site for the most recent versions of all related Brocade Communications Systems, Inc. documentation.

- *Converged Enhanced Ethernet Administrator's Guide*
- *Converged Enhanced Ethernet Command Reference*
- *Fabric OS release 6.3.1_cee Release Notes*
- *Access Gateway Administrators Guide*
- *Secure Fabric OS Administrator's Guide*
- *Fabric Manager Administrator's Guide*
- *Fabric Watch Administrator's Guide*
- *Fabric OS Administrator's Guide*
- *Fabric OS Command Reference Manual*
- *Fabric OS MIB Reference Manual*
- *Fabric OS System Error Message Reference Manual*
- *Web Tools Administrator's Guide*
- *End User License Agreement* (EULA)
- Release Notes
- Readme files
- Instructions

To obtain relevant Brocade documentation for device drivers, the Advanced Web Tools program, and other tools, go to http://www.ibm.com/systems/support/ and enter the search term Brocade to list and access the applicable Web sites.

Inventory checklist

Make sure that the shipping carton contains the following items:

- One Brocade FCoE Switch Module for IBM BladeCenter (base model has two 10GbE SFP+ modules)
- IBM *Important Notices* document
- IBM *Warranty and Support Guide*
- One mini-USB console cable with serial connectors
- BCHT interposer gasket kit (if the switch module is inserted in the BCHT chassis)
- DB9 to RJ45 adapter
- The *IBM Documentation CD*. which contains the following documents:
  - This *Installation and Users Guide* (this document)

- *IBM Safety Information* document (multilingual)
- *IBM Environmental Notices and User's Guide*
- Brocade EULA
- Brocade CEE Admin guide
- Brocade CEE CLI guide
- Brocade MIBS manual

If any of these items are missing or damaged, contact your authorized reseller for replacement.

Notices and statements in this document

The caution and danger statements in this document are also in the multilingual *Safety Information* document, which is on the IBM *BladeCenter Documentation* CD for the BladeCenter unit. Each statement is numbered for reference to the corresponding statement in your language in the *Safety Information* document.

The following notices and statements are used in this document:

Note: These notices provide important tips, guidance, or advice.

Important: These notices provide information or advice that might help you avoid inconvenient or problem situations.

Attention: These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.

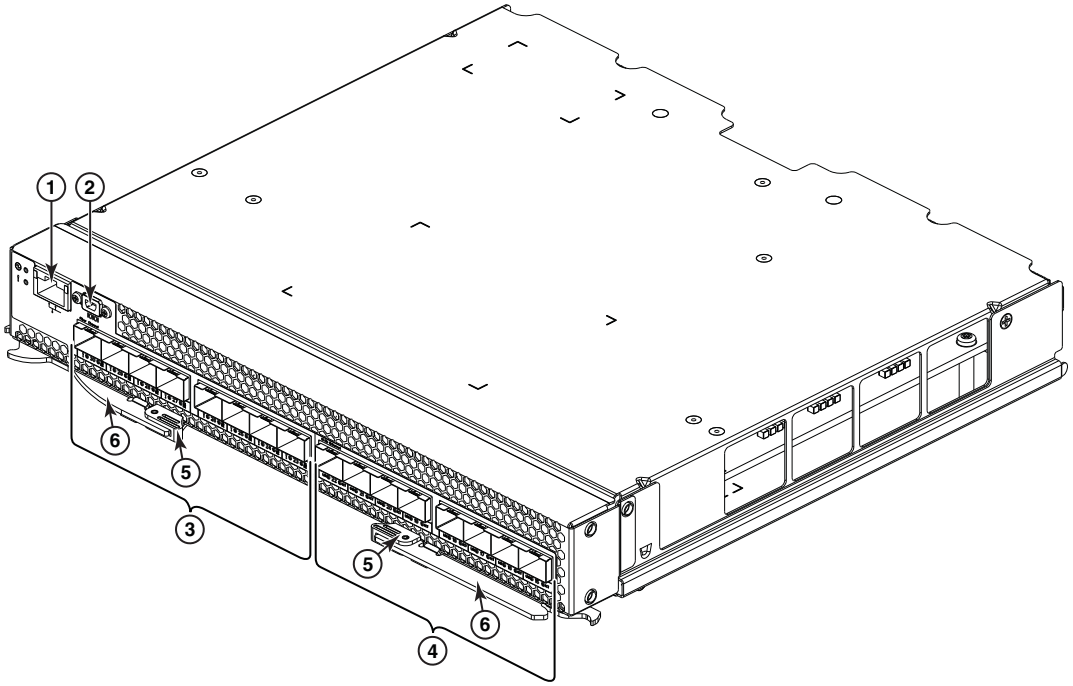
Caution: These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.

Danger: These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Major components of the switch module

The following illustration shows the major components of the switch module.

Note: The illustrations in this document might differ slightly from your hardware.



1	RJ45 Ethernet port (eth1)	2	mini-USB console port
3	Fibre Channel ports	4	10GbE FCoE/CEE ports
5	Release latches	6	Release levers

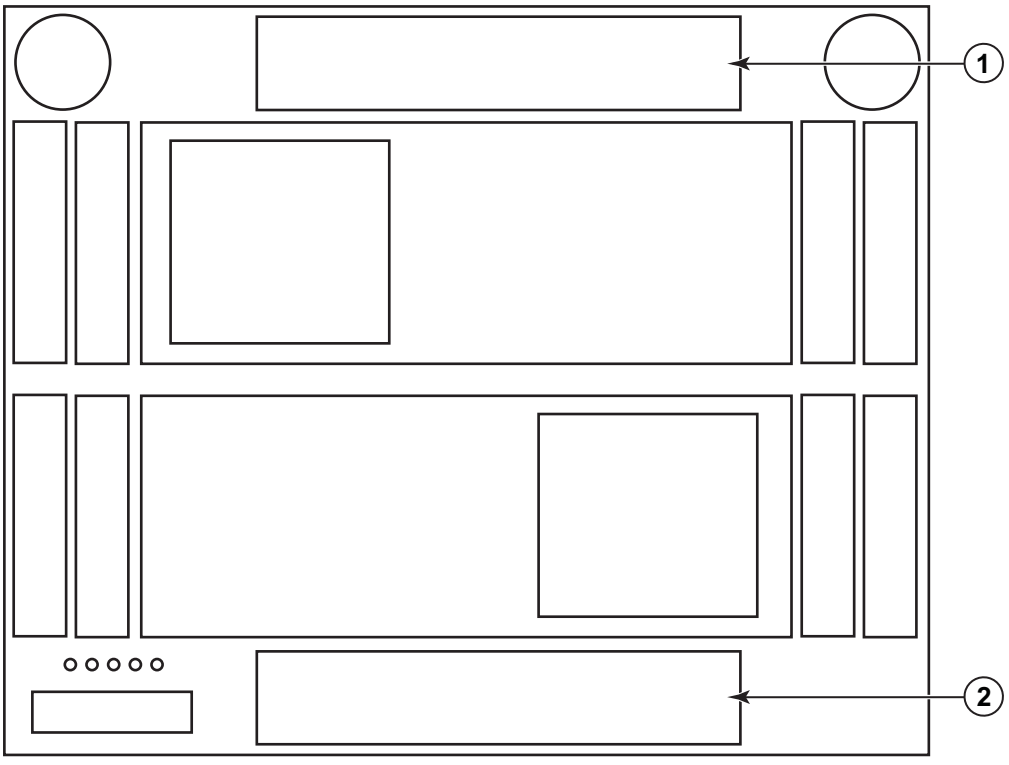
FIGURE 1 Major components

Chapter 2. Installing and replacing a high speed switch module

This chapter provides instructions for installing a switch module in the BladeCenter unit and for removing a switch module from the BladeCenter unit. See the documentation for your BladeCenter unit for information about high-speed module bay locations and the components that can be installed in them that is specific to your BladeCenter unit type.

The following illustrations show examples of a BladeCenter H (BCH) chassis and a BladeCenter HT (BCHT) chassis with the high-speed module (HSSM) bays identified. In the BCH, these bays are in the rear of the BladeCenter chassis. In the BCHT, these bays are in the front of the BladeCenter chassis.

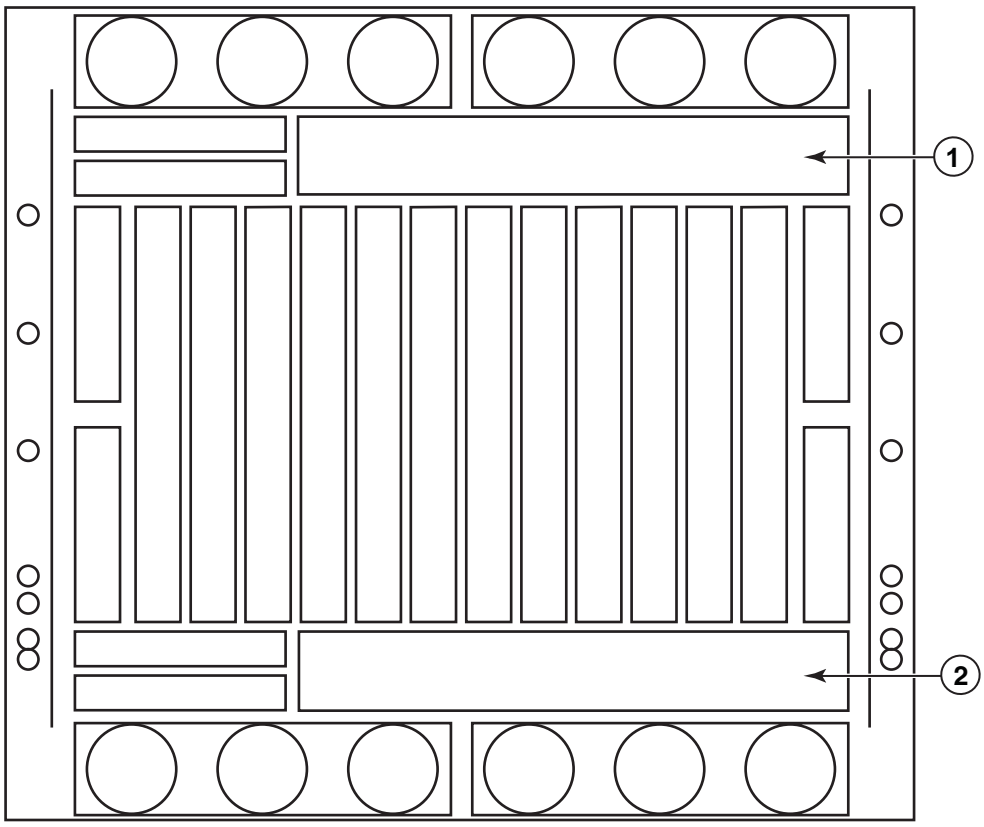
NOTE
The Brocade FCoE Switch Module is a double-height unit and thus takes up two HSSM bays when installed.



1 HSSM bays 7 and 8

2 HSSM bays 9 and 10

FIGURE 2 HSSM bays for BladeCenter H chassis



1 HSSM bays 7 and 8 2 HSSM bays 9 and 10

FIGURE 3 HSSM bays for BladeCenter HT chassis

A compatible expansion card or converged network adapter (CNA) must be installed in each blade server that you want to communicate with. To enable the switch module to communicate with a blade server, at least one switch module must be installed in the BladeCenter unit. For details about expansion-card installation, configuration, and use, see the documentation that comes with the expansion card.

Installing a second switch module enables a redundant path and a separate connection from the blade server to the external Ethernet network or Fibre Channel SAN.

The BladeCenter unit supports a maximum of two Brocade FCoE Switch Modules. The BladeCenter H chassis supports a maximum of 14 compatible expansion cards and the BladeCenter HT chassis supports a maximum of 12 compatible expansion cards.

Notes:

- The blade servers or BladeCenter units that are described or shown in this document might be different from your blade server or BladeCenter unit. For additional information, see the documentation that comes with your blade server or BladeCenter unit.
- If you are installing only one switch module, use high-speed module bay 7/8. This is preferred over bay 9/10.
- When the switch module is installed in a BladeCenter unit, the internal ports operate at an autonegotiated speed of 1 Gbps or 10 Gbps inclusive. The external FC ports can operate at 2, 4, or 8 Gbps (auto-negotiated) and the CEE ports operate at 10 Gbps.

- Configuration requirements for the switch module and the BladeCenter unit might vary. You can obtain up-to-date information about the switch module and the BladeCenter unit at http://www.ibm.com/systems/bladecenter/.

Installation guidelines

Before you install the switch module in the BladeCenter unit, read the following information:

- Read the safety information that begins on page v, "Handling static-sensitive devices" on page 10, and the safety statements in the BladeCenter unit documentation. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the blade server or BladeCenter unit, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component on the switch module, blade server, or BladeCenter unit indicates that the component can be hot-swapped, which means that if the BladeCenter unit and operating system support hot-swap capability, you can remove or install the component while the BladeCenter unit is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- You do not have to turn off the BladeCenter unit to install or replace any of the hot-swap modules on the front or rear of the BladeCenter unit.
- When you install a switch module in the BladeCenter unit, you must also install a compatible I/O expansion card in the blade server to support the switch module.
- When you are finished working on the blade server or BladeCenter unit, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the BladeCenter unit and other IBM products, see http://www.ibm.com/servers/eserver/serverproven/compat/us/.

System reliability guidelines

To help ensure proper cooling, performance, and system reliability, make sure that the following requirements are met:

- Each of the module bays on the rear of the BladeCenter unit contains either a module or a filler module.
- A removed hot-swap module is replaced with an identical module or filler module within 1 minute of removal.
- A removed hot-swap blade server is replaced with another blade server or filler blade within 1 minute of removal.
- The ventilation areas on the sides of the blade server power modules and blowers are not blocked.
- You have followed the reliability guidelines in the documentation that comes with the BladeCenter unit.

Cable requirements for the switch module are described in the IBM *Configuration and Options Guide* at http://www.ibm.com/servers/eserver/xseries/cog/. See the documentation that comes with the blade server for cable-routing information

Handling static-sensitive devices

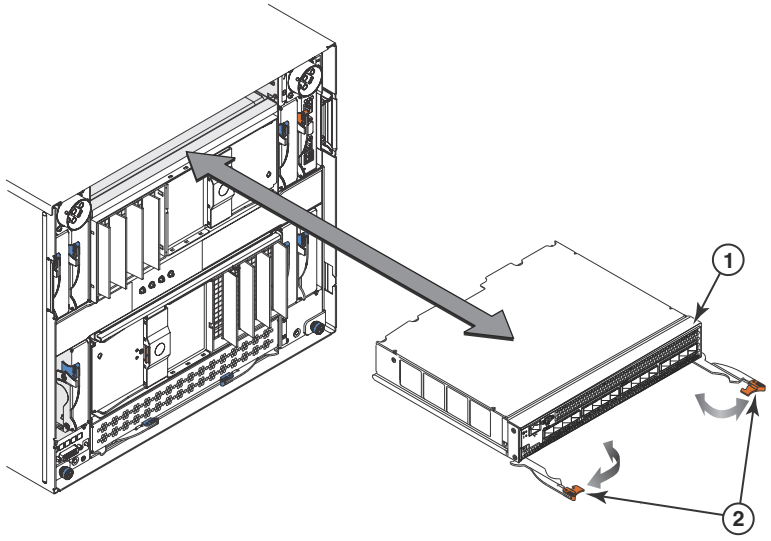
Attention: Static electricity can damage the BladeCenter unit and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them. To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal surface of the BladeCenter unit chassis or an unpainted metal surface on any other grounded rack component in the rack that you are installing the device in for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the BladeCenter unit without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the BladeCenter unit or on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.
- Some types of BladeCenter units come with electrostatic discharge (ESD) connectors. If the BladeCenter unit is equipped with an ESD connector, see the documentation that comes with the BladeCenter unit for using the ESD connector.

Installing a switch module

Note: The following illustration shows how to install a switch module in a Type 8852 BladeCenter unit. The appearance of your BladeCenter unit might be different; see the documentation for your BladeCenter unit for additional information.

To install a switch module, complete the following steps:



1	Brocade FCoE Switch Module	2	Release levers (open position)

FIGURE 4 High speed switch module insertion

1. Read the safety information that begins on page ix and "Installation guidelines" on page 9.
2. Select the high-speed module bay in which to install the switch module.

   Note: For details about high-speed module bay requirements and bay locations, see the documentation for the BladeCenter unit and blade servers.
3. Remove the filler module from the selected bay. Store the filler module for future use. The high speed switch module is a double-height unit and will take up two HSSM bays. If you have two single height filler modules, remove both from the adjacent bays.
4. If you have not already done so, touch the static-protective package that contains the switch module to an *unpainted* metal surface of the BladeCenter unit or an *unpainted* metal surface on any other grounded rack-component for at least 2 seconds.
5. If you are installing the switch module in a BCH-T chassis, you must first install the upper and lower interposer trays and the gasket kit. Please see the instructions shipped with the Interposer Kit for details. Other wise, skip to step 6.
6. Remove the switch module from its static-protective package.
7. Make sure that the release levers on the switch module are in the open position (perpendicular to the module).

   For specific instructions for installing a switch module in the BladeCenter unit, see the documentation that comes with the BladeCenter unit.
8. Slide the switch module into the applicable high-speed module bay until it stops.
9. Push the release levers on the front of the switch module to the closed position. After you insert and lock the switch module, it is turned on, and a power-on self-test (POST) occurs to verify that the switch module is operating correctly.

   Notes:

The switch module takes approximately 60 seconds to complete the POST. When the switch module is turned on, an LED test occurs. All LEDs are lit and remain lit during POST; then, all the LEDs except the OK LED turn off. This indicates normal POST results.

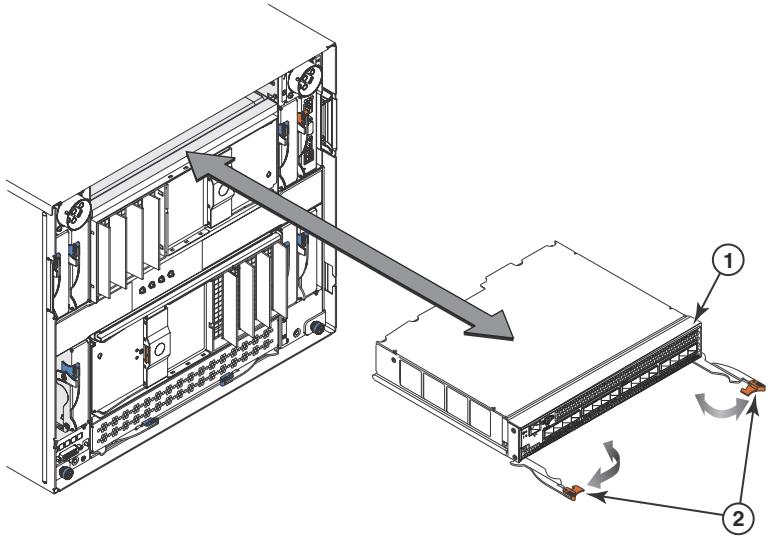
To maintain proper airflow, make sure that the ventilation holes on the front of the switch module are not blocked.

10. Make sure that the LEDs on the switch module indicate that it is operating correctly (see "Information LEDs" on page 24).
11. If you have another switch module to install, repeat step 3 on page 10 through step 10; otherwise, go to the next step.
12. Install any additional SFP+ modules you may have ordered in the switch module. For information and instructions, see , "Chapter 3. Installing and removing an SFP+ module" on page 15 and the documentation that comes with the SFP+ module.
13. Attach any cables that are required by the switch module. For additional information about cabling the switch module, see , "Chapter 4. Cabling the switch module and the SFP+ module" on page 19, the documentation that comes with the cables, and the optional network devices to which the cables have been connected. For the locations of the connectors on the BladeCenter unit, see the documentation that comes with the BladeCenter unit. Then, continue with the next step.
14. Make sure that the external ports on the switch module are enabled through one of the management module interfaces, such as the Web-based interface or the CLI.

Removing or replacing a switch module

Note: The following illustration shows how to remove and replace a switch module from a Type 8852 BladeCenter unit. The appearance of your BladeCenter unit might be different; see the documentation for your BladeCenter unit for additional information.

To replace a switch module, complete the following steps:



1	Brocade FCoE Switch Module	2	Release levers (open position)

FIGURE 5 High speed switch module removal

1. Read the safety information that begins on page ix, and "Installation guidelines" on page 9.
2. Disconnect any cables from the switch module that you are removing. Removing these cables (especially an Ethernet cable) disrupts the network connection from the external Ethernet port to any connected external Ethernet devices. If you plan to replace the switch module with another switch module, you can use the existing Ethernet cable, provided that it remains securely attached to the Ethernet network. For additional information about cabling the switch module, see "Chapter 4. Cabling the switch module and the SFP+ module" on page 19, the documentation that comes with the cables, and the optional network devices to which the cables have been connected. For the locations of the connectors on the BladeCenter unit, see the documentation that comes with the BladeCenter unit. Then, continue with step 3.
3. Pull the release latches out from the switch module. The switch module moves out of the bay approximately 0.6 cm (0.25 inch).
4. Slide the switch module out of the bay and set it aside.
5. Place either another switch module or a filler module in the bay.

   Important: Complete this step within 1 minute. (For more information, see steps 8 and 9 on page 11.)
6. If you placed a switch module in the bay, reconnect the other cables that you disconnected. Attach any additional cables that are required by the switch module. For additional information about cabling the switch module, see "Chapter 4. Cabling the switch module and the SFP+ module" on page 19, the documentation that comes with the cables, and the optional network devices to which the cables have been connected. For the locations of the connectors on the BladeCenter unit, see the documentation that comes with the BladeCenter unit. Then, continue with "Chapter 3. Installing and removing an SFP+ module" on page 15.

Chapter 3. Installing and removing an SFP+ module

The switch module supports both the 8-Gbps and 4-Gbps FC SFP+ transceiver and the 10-Gbps CEE SFP+ transceiver. The SFP+ transceivers are laser products that convert electrical signals to optical signals.

For additional information about the location of the switch module, the network interface requirements, and expansion options, see the documentation for your BladeCenter unit.

NOTE
The illustrations in this document might differ slightly from your hardware.

Handling an SFP+ module

Before you install an SFP+ module, read the following information:

- The module housing of the SFP+ has an integral guide key that is designed to prevent you from inserting the module incorrectly.
- Use minimal pressure when you insert the module into the port. Forcing the module into the port can cause damage to the module or the module port.
- You can insert or remove the module while the BladeCenter unit is turned on.
- You must first insert the module into the port before you can connect the cables.
- You must remove the cable from the SFP+ module before you remove the SFP+ module from the switch module.

Statement 3:

CAUTION

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following:

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

CAUTION

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil A` Laser de Classe 1

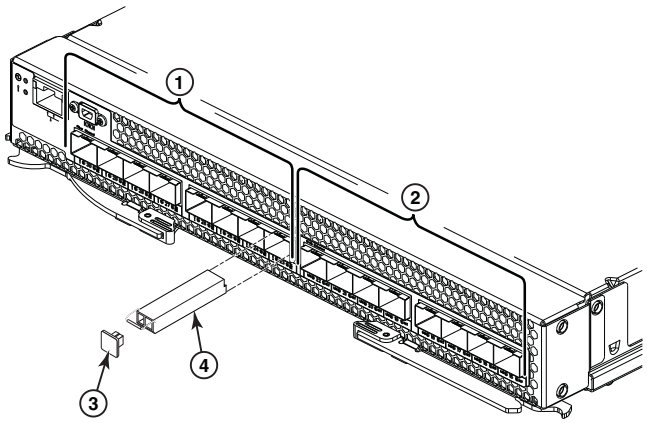
Installing an SFP+ module

The SFP+ module provides two fiber-optic cable connectors for connecting to external ports. To install an SFP+ module, complete the following steps:

1. Read the safety information that begins on page ix and "Installation guidelines" on page 9.
2. If you have not already done so, touch the static-protective package that contains the SFP+ module to an *unpainted* metal surface of the BladeCenter chassis or an *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the switch module for at least 2 seconds.
3. Read the information in "Handling an SFP+ module" on page 15.
4. Remove the SFP+ module from its static-protective package.
5. Remove the protective insert, if one is installed, from the port where you are installing the SFP+ module and store it in a safe place.
6. Remove the protective cap from the SFP+ module and store it in a safe place.

ATTENTION
To avoid damage to the cable or the SFP+ module, make sure that you do not connect the fiber optic cable *before* you install the SFP+ module.

7. Insert the SFP+ module into the SFP+ module port until it clicks into place.



1	FC ports	3	Protective cap
2	FCoE/CEE ports	4	SFP+ module

FIGURE 6 SFP+ installation

8. Remove the protective cap from the transceiver and connect the fiber optic cable (see "Connecting the SFP+ module cable" on page 20) and any cables that you disconnected earlier.

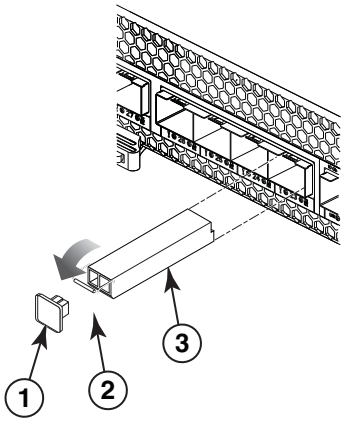
Removing an SFP+ module

To remove an SFP+ module, complete the following steps:

1. Read the safety information that begins on page v and "Installation guidelines" on page 9.
2. Read the information in "Handling an SFP+ module" on page 15.
3. Remove the fiber optic cable from the SFP+ module that you want to replace. For more information about removing the cable, see "Disconnecting the SFP+ module cable" on page 21.

ATTENTION
To avoid damage to the cable or the SFP+ module, make sure that you disconnect the fiber-optic cable *before* you remove the SFP+ module.

4. Unlock the SFP+ module by pulling the wire tab straight out, as shown in the following illustration.



1	Protective cap	3	SFP+ module
2	Wire tab		

FIGURE 7 SFP+ removal

5. Grasp the wire tab on the SFP+ module and pull it out of the port.
6. Replace the protective cap on the SFP+ module and the port.
7. Place the SFP+ module into a static-protective package.

Chapter 4. Cabling the switch module and the SFP+ module

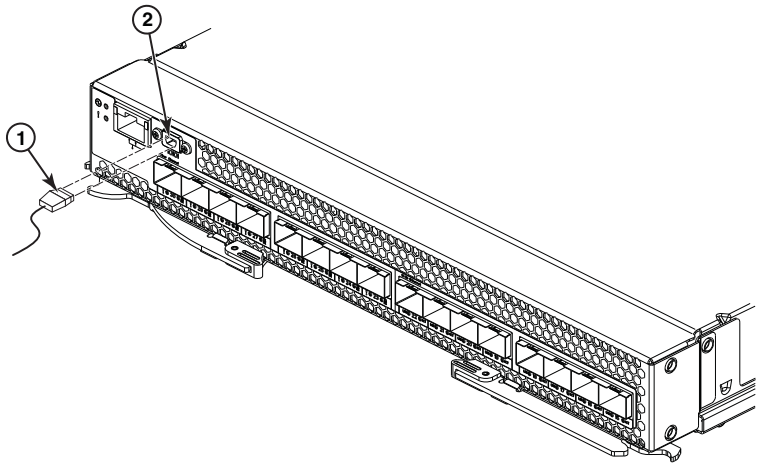
This chapter describes how to cable the switch module and its optional devices.

NOTE
The illustrations in this document might differ slightly from your hardware.

Connecting the USB console cable

To connect the USB console cable to the switch module, connect the cable to the mini-USB console port of the switch module and the other end of the cable to the console device.

The USB console cable supplied with the Brocade FCoE Switch Module has a mini-USB connector for the switch module connection and a DB9 male connector to connect to your console device. Depending on your requirements to connect with the console device, you may need to use a DB9 to RJ45 adapter also supplied with the switch module. Both straight and crossover adapters are supplied. Additional cabling and adapters may also be required.



1 USB console cable
2 mini-USB console port

FIGURE 8 USB cable connection

Disconnecting the USB console cable

To disconnect the USB console cable, grasp the connector and gently pull the cable from the switch module.

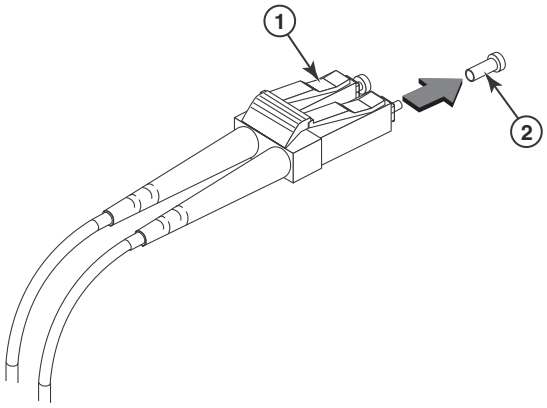
Connecting the SFP+ module cable

ATTENTION
To avoid damage to the fiber optic cables, follow these guidelines:

- Do not route the cable along a folding cable-management arm.
- When you attach the cable to a device on slide rails, leave enough slack in the cable so that it does not bend to a radius of less than 38 mm (1.5 in.) when the device is extended or become pinched when the device is retracted.
- Route the cable away from places where it can be snagged by other devices in the rack.
- Do not overtighten the cable straps or bend the cables to a radius of less than 38 mm (1.5 in.).
- Do not put excess weight on the cable at the connection point. Make sure that the cable is well supported.

To connect the SFP+ module cable, complete the following steps:

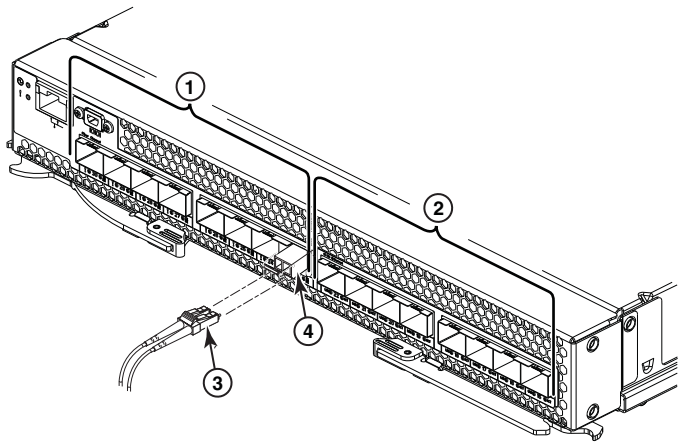
1. Remove the protective caps from the end of the fiber optic cable.



1 Fiber optic cable
2 Protective cap

FIGURE 9 Fiber optic cable cap

2. Gently slide the fiber optic cable into the SFP+ module until it clicks into place.



1	FC ports	3	Fiber optic cable
2	CEE ports	4	SFP+ module

FIGURE 10 Fiber optic cable insertion

3. Check the LEDs on the switch module. When the switch module is operating correctly, the green link LED is lit. For information about the status of the switch module LEDs, see , "Chapter 5. Information panels, LEDs, and external ports," on page 23.

Disconnecting the SFP+ module cable

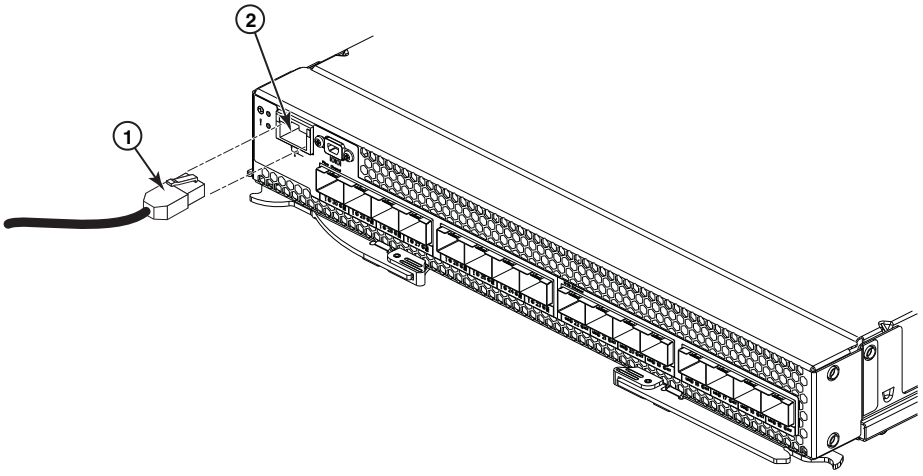
To disconnect the SFP+ module cable, complete the following steps:

1. Squeeze the release tabs and gently pull the fiber optic cable from the SFP+ module.
2. Replace the protective caps on the ends of the fiber optic cable.

Connecting the RJ-45 Ethernet cable

The RJ-45 Ethernet cable can be connected to the RJ-45 port.

To connect the RJ-45 connector to the switch module, push the connector into the port connector until it clicks into place, as shown in the following illustration.



1 RJ-45 cable

2 RJ-45 Ethernet port

FIGURE 11 RJ-45 cable connection

Disconnecting the RJ-45 cable

To disconnect the RJ-45 connector, squeeze the release tab and gently pull the cable connector out of the switch module connector.

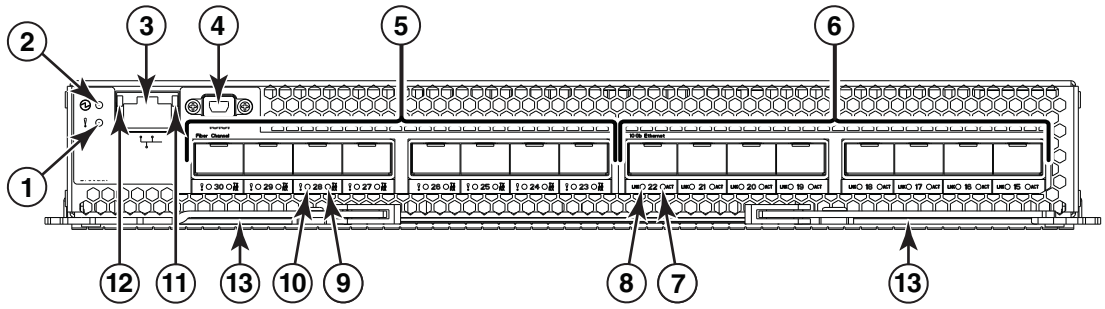
Chapter 5. Information panels, LEDs, and external ports

This chapter describes the information panels and LEDs on the switch module and identifies the external ports on the information panels.

NOTE
The illustrations in this document might differ slightly from your hardware

Information panel

The front panel of the switch module contains information LEDs, eight FC and eight CEE SFP+ module port connectors, one mini-USB console port connector, and one Ethernet port connector, as shown in the following illustration.



1	Status/Fault LED (amber)	8	CEE port link status LED (green)
2	Power LED (green)	9	FC port fault status LED (amber)
3	Ethernet port (RJ45)	10	FC port Tx/Rx link status LED (green)
4	Console port (mini-USB)	11	Ethernet port speed LED (green)
5	Fibre Channel ports (23-30 - right to left)	12	Ethernet port Link LED (green)
6	CEE ports (15-22 - right to left)	13	Release levers(2)
7	CEE port fault status LED (amber)		

FIGURE 12 high speed switch module front panel

The switch module information panel contains the following components:

- LEDs that display the following information:
  - The status of the switch module and its network connection
  - The status of the external connections to the switch module

  For further details about LEDs, see “Information LEDs” on page 24.
- Eight FC SFP+ port connectors to attach SFP+ modules. They are numbered 23-30 right to left.
- Eight FCoE/CEE SFP+ port connectors to attach SFP+ modules. They are numbered 15-22 right to left

- One RJ-45 Ethernet port connector. Do *not* attach any devices to this connector other than a compatible cable.
- One mini-USB console port connector used for switch management. This port requires a mini-USB plug on the serial cable.

Information LEDs

The front panel of the switch module has two sets of LEDs. The power and status/fault LEDs on the left of the switch module indicate the switch module status. The fault (!) and activity (TX/RX) LEDs on the FC ports and the fault (!) and activity (TX/RX) LEDs on the CEE ports indicate the status of the external ports. Each port has two LEDs. The Ethernet port has separate link and activity LEDs.

See Figure 12 on page 23 for the locations of the LEDs on the switch module. These LEDs are described in "Switch module status LEDs" on page 24 and "Port status LEDs" on page 25.

NOTE
An amber LED on the BladeCenter unit is lit when a system error or event has occurred. To identify the error or event, check the BladeCenter Advanced Management Module event log or the switch system log.

An LED test occurs whenever the switch module is turned on. All LEDs are lit and remain lit during POST, and then all the LEDs except the OK LED turn off.

Any errors that are detected during POST are written to the system log.

When POST errors are written to the system log, these errors are also written to the BladeCenter management module event log. If a hardware error, such as a current fault occurs, the management module displays it. If a software error occurs, the management module displays the Module did not complete POST message and a post error code that indicates the test that was running when the error was detected.

NOTE
You can also use the management module to make sure that the switch module is operating correctly. For more information, see the documentation for the BladeCenter unit.

Switch module status LEDs

The following table provides descriptions of the switch module status LEDs on the front panel of the switch module.

TABLE 2 Switch module status LEDs

Status LED	Description
Status/fault (!) LED (amber)	• Steady amber. There has been a POST failure or critical alert. **Note:** When this LED is lit, the system-error LED on the BladeCenter unit is also lit. • Off. The switch module is working correctly if the green power LED is on. If the green LED is also off, the switch module is off.
Power (⏻) LED (green)	• Steady green. The switch module is on. • Off. When the amber switch module error LED is on, it indicates a critical alert. When the amber LED is also off, it indicates that the switch module is off.

Port status LEDs

The following table provides descriptions of the port status LEDs on the front panel of the switch module.

TABLE 3 Port status LEDs

Status LED	Description
FC Tx/Rx Status LED (green)	• No light. There is no link. • Steady green. There is a link. • Flashing green.There is link activity.
FC Fault Status LED (amber)	• Steady amber. There is a fault on the port.
CEE Link Status LED (green)	• No light. There is no link. • Steady green. There is a link. • Flashing green.There is link activity.
CEE Fault Status LED (amber)	• Steady amber. There is a fault on the port.
Ethernet Link LED (green)	• No light. There is no link.
	• Steady green. There is a link.
	• Blinking green. There is link activity.
Ethernet Speed LED (green)	• No light. Port speed is 10 Mbps.
	• Steady green. Port speed is 100/1000 Mbps.

POST activity

Once installed, the high speed switch module is managed by the blade server chassis Management Module. For specific information about managing the high speed switch module, refer to the blade server chassis manufacturer's documentation.

The Power-on Self Test (POST) system check is performed each time the switch module is powered on, rebooted, or reset. During the POST, the LEDs are activated in various indicator patterns.

To determine whether POST completed successfully, or whether any errors were detected:

- Verify that the LEDs on the switch module indicate a healthy high speed switch module.

If one or more LEDs do not display a healthy state, verify that the LEDs are not set to beacon. Use the **switchShow** command or Web Tools to verify the LED state. For information about how to turn beaconing on and off, refer to the *Fabric OS Administrator's Guide* or the *Web Tools Administrator's Guide*.

- Use the blade server chassis' Management Module to verify that the switch module is working correctly.
- Review the system log for errors.

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

POST-operation LED indications

The system status LEDs flash in various patterns during boot, POST, or other diagnostic tests. This is normal and does not indicate a problem unless the LEDs do not indicate a healthy state after all boot processes and diagnostic tests are complete.

During POST and some diagnostics, both system status LEDs—located at the top of the installed switch module—operate simultaneously. The LED indications are described in Table 4.

TABLE 4 LED Patterns, POST mode

Condition	Power LED (Green)	Status/Fault LED (Amber)
pre-POST start	Off	Off
POST start Lamp test POST in progress	 On briefly Blinking	 On briefly Off
POST critical failure (nonfunctional)	Off	On
POST noncritical failure (functioning but degraded mode)	On	On
POST successful complete	On	Off
Extended POST start	Blinking	Off
Extended POST critical failure (nonfunctional)	Off	On
Extended POST noncritical failure (functioning but degraded mode)	On	On

Chapter 6. Configuring the switch module

The switch module has an internal Ethernet path to the management module, eight external CEE ports, eight external FC ports, one external management port, and a serial console port. The switch module supports two remote-access modes for management through Ethernet connections. You can select the mode that is best suited for your BladeCenter environment.

- **Default mode:** The default mode uses the internal path to the management module only. In this mode, the remote-access link to the management console must be attached to the Ethernet connector on the management module. The Internet protocol (IP) addresses and SNMP parameters of the switch modules can be automatically assigned by the IBM Director BladeCenter Deployment wizard (when available), or you must assign them through the BladeCenter Management and Configuration Program. This mode enables you to provide a secure LAN for management of the BladeCenter subsystems that is separate from the data network. See "Establishing a TCP/IP session through the management module" on page 28 for more information.
- **Remote management mode:** You can enable remote management of the switch module through the external ports, instead of or in addition to access through the management module. This mode can be enabled only through the management module configuration interface. When this mode is enabled, the external SFP+ ports support both management traffic and BladeCenter application data traffic. This mode enables the use of additional switch module IP addresses on different IP subnets than the management modules. This is useful when the switch modules are to be managed and controlled as part of the overall network infrastructure, while secure management of other BladeCenter subsystems is maintained through the management module. See "Enabling management through external ports" on page 29 for additional instructions about configuring the switch module for this mode of operation.

The mini-USB console port provides an alternative path to manage and configure the switch for local access.

Important:

- Before you configure the switch module, make sure that the management modules in the BladeCenter unit are correctly configured. For more information about configuring the switch module, see the following documents:
  - *Installation and User's Guide* for the BladeCenter unit
  - *BladeCenter Advanced Management Module Installation Guide* or *BladeCenter T* Advanced Management Module Installation Guide
  - *IBM BladeCenter Advanced Management Module User's Guide*
- When installed in high-speed slots 7/8, the default IP address of the switch module is 10.90.90.80. When installed in high-speed slots 9/10, the default IP address of the switch module is 10.90.90.81.
- If you change the IP address of the switch module from the AMM. and restart the switch, it will maintain this new IP address as its default value.
- The management module and the switch module can communicate with each other only if they are on the same IP subnet.

- When you use the management module Web interface to update the switch module configuration, the management module firmware saves the new configuration in its internal nonvolatile random access memory (NVRAM). If the switch module restarts, the management module applies the saved configuration to the switch module.

  If the switch module restarts and the management module cannot apply the saved configuration, the switch module defaults to using the configuration that it had previously saved. If the IP subnet address of the switch module does not match the IP subnet address of the management module, you can no longer manage the switch module from the management module.

- For switch communication with a remote management station, such as an IBM Director management server, through the management module external Ethernet port, the switch module internal-network interface and the management module external interface must be on the same IP subnet.
- Only one FCoE-capable VLAN can be configured on the Brocade FCoE Switch Module.

For specific details about configuring the switch module and preparing for system installation, see the documentation listed in “Related documentation” on page 3.

Notes:

- Unless otherwise stated, references to the management module apply only to the BladeCenter Advanced Management Module, which is the only type of management module that supports the switch module.
- Throughout this document, the management module Web-based user interface is also known as the BladeCenter management module Web interface.
- Throughout this document, the user name is also known as the login name or user ID for logging on to interfaces or programs.
- The screens that are described or referenced in this document might differ slightly from the screens that are displayed by your system. Screen content varies according to the type of BladeCenter unit and the firmware versions and options that are installed

Establishing a TCP/IP session through the management module

To establish a TCP/IP session for the switch module through the management module, complete the following steps:

1. Log on to the management module as described in the ***User's Guide*** or ***Command Line Interface Reference Guide*** for your advanced management module. If necessary, obtain the IP address of the management module from your system administrator. The management module window opens.

   NOTE
   The **User ID** and **Password** fields are case-sensitive. Type your information in uppercase letters only. To maintain system security, change your password after you log on for the first time. The default User ID is USERID, and the default password is PASSW0RD (where the sixth character is the number zero, not the letter O).

2. From the **I/O Module Tasks** menu, click **Configuration**.
3. In the **I/O Module Configuration** area, click the bay number that corresponds to the location of the switch module that you installed.

4. In the **IP address** field in the **New Static IP Configuration** area, type the new TCP/IP address of the switch module; then, click **Save**.

NOTE
The management module does not check for invalid IP addresses.

5. Click **Advanced Configuration**. You can now start a Web session or a Telnet session.

The Web interface and the Telnet program provide different ways to access the same internal-switching software and configure it.

- If your system application requires that you use the Web interface program, see "Configuring the switch module through the switch module browser-based interface" on page 32 for additional information.
- If your system application requires that you use the Telnet program, see "Configuring the switch module through the Telnet interface" on page 30 for additional information.

Enabling management through external ports

To access and manage the switch module through external interfaces, you must enable the external ports and the ability to manage the switch through them. Use the information in the following table to configure your ports.

TABLE 5 LED Patterns, POST mode

External Management	External ports	Description
Disabled	Disabled	The switch must be managed through the management module. No traffic is allowed on external ports.
Disabled	Enabled	The switch must be managed through the management module. Data traffic is allowed on external ports
Enabled	Disabled	This mode is not supported.
Enabled	Enabled	The switch can be managed through the management module, a blade server, or a management station that is connected through an external port. Data traffic is allowed on external ports.

To enable management through external ports, complete the following steps:

1. Log on to the management module as described in the *User's Guide* or *Command Line Interface Reference Guide* for your advanced management module.

   If necessary, obtain the IP address of the management module from your system administrator. The management module window opens.

2. Click **I/O Module Tasks → Configuration** and click the bay number that corresponds to the location of the switch module that you installed.
3. Click **Advanced Configuration** and make sure that external management is enabled.
4. Click **I/O Module Tasks → Admin/Power/Restart** and make sure that the external ports are enabled for the switch module that you installed.

Configuring the switch module through the Telnet interface

The switch module supports a command-line interface (CLI) that you can use to configure and control the switch module over the network through the Telnet program. You can use the CLI to perform many basic network-management functions. In addition, you can configure the switch module for management through an SNMP-based network-management system. The following sections describe how to use the Telnet interface to access the switch module, change its settings, and monitor its operation.

Connecting to the switch module

If you know the IP address for the switch module and you have an existing network connection, you can use the Telnet program from an external management station or the management module to access and control the switch module. The management station and the switch module must be on the same IP subnet. If you have to obtain the IP address for the switch module or establish a network connection, contact your system or network administrator. Be sure to use the correct IP address in the required command, as specified in "Accessing the main menu."

Accessing the main menu

To connect to the switch module through the Telnet interface, complete the following steps:

1. From a DOS command-line prompt, type telnet *xxx.xxx.xxx.xxx* and press Enter.

   where *xxx.xxx.xxx.xxx* is the IP address for the switch module.

2. The default user ID is **USERID** and the default password is **PASSWORD**, where the sixth character is a zero.

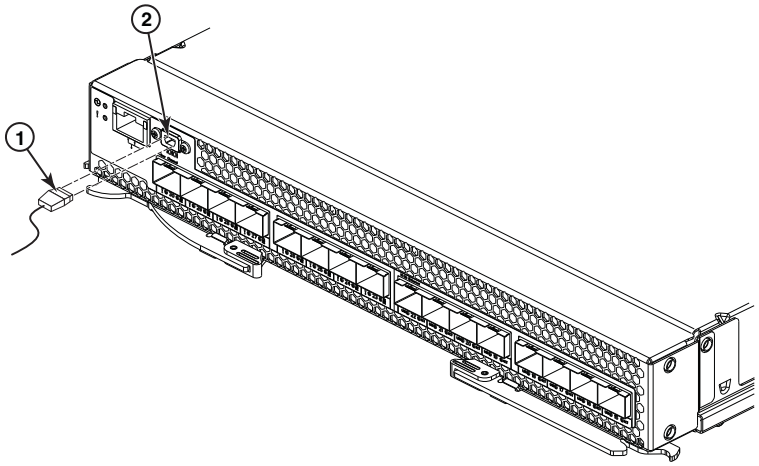
Important: The **apply** command changes the currently active configuration. If you want your change to persist beyond the next reboot of the switch, you must enter the **save** command. This command stores the current switch configuration and all changes in nonvolatile memory.

Configuring the switch module through the mini-USB interface

The mini-USB port provides basic communication serial-data transfer through a terminal emulation program (such as Hyperterminal). Because messages from the power-on self-test (POST) and all initialization information are transmitted through the serial port, you can use the serial port to log in to the switch module and access and configure the internal switching software.

To log in to the switch module, complete the following steps:

1. Connect one end of the specifically designed USB cable that comes with your device into the mini-USB port and connect the other end to the management station.



1 USB console cable 2 mini-USB console port

FIGURE 13 USB cable connection

   For additional information, see "Connecting the USB console cable" on page 19.

2. On the management station, open a console window and make sure that the serial port is configured with the following settings:

   9600 baud
   8 data bits
   No parity
   1 stop bit
   No flow control

3. Type the user name and password. The default user name is **USERID**. The default password is **PASSWORD** where the sixth character is a zero.

The mini-USB port is compatible with the standard 16550 Universal Asynchronous Receiver/Transmitter (UART) protocol. The port is enabled by default.

Connecting to the switch module using Web Tools

Perform these steps to connect directly to the switch module using the Brocade Web Tools without using the management module. Brocade Web Tools is a graphical user interface you can use to configure the switch directly.

1. On a computer in the same network as the switch module, open a supported web browser, such as Internet Explorer.
2. Enter the IP address of the switch module in the address field.
3. Log into Web Tools using the default administrative account.

   Login: **USERID**

   Password: **PASSWORD** where the sixth character is a zero

   See the *Web Tools Administrator's Guide* for more information on using Web Tools.

NOTE
The passwords that are used to access the switch module are case-sensitive. To increase system security, change the password after you log on for the first time.

Initial configuration

The operating software on the switch module contains default configuration files that are installed during the software installation. These initial configuration settings are not in a separate configuration file but are components of the software. When you restore the management module to factory defaults, the original configuration is restored.

Logging in to the switch module

The switch module supports user-based security that enables you to prevent unauthorized users from accessing the switch or changing its settings.

To log in to the switch module, complete the following steps:

1. At the prompt, type your user ID and press Enter. The default user ID is USERID.
2. Type your password (default is PASSWORD where the sixth character is a zero) and press Enter. The main-menu window opens.

After you log on to the switch module, you must set the date and time by using the **date** command in the form **date** "mmddhhmmyy" where mm is month, dd is day, hh is hour, mm is minute, and yy is year.

Configuring for FCoE

The initial configuration of the switch has the CEE ports shut down. In order to configure the ports for FCoE operation, you must access the CEE command shell and configure both the internal and external CEE ports. Once you have logged into the switch, use the cmsh command to access the CEE command shell. Use the following steps to configure the CEE ports.

1. Login to the switch.
2. From the command prompt type **cmsh** and press Enter.
3. Type **enable** and press Enter.

4. Type **conf t** and press Enter.
5. Type **int int** (press tab to complete the second int) **0/x** where x is the internal port you wish to change and press Enter.
6. Once in the particular interface type **fcoeport** and press Enter.
7. Type **no shut** and press Enter.
8. Type **exit** and press Enter.
9. Repeat steps 5-8 for any other blade port you wish to configure.
10. Once finished with all of the blade ports, type **exit** and press Enter (you should still be in the CMSH at this point).
11. Type **write mem** and press Enter.

    Answer **yes** to overwrite the startup file.
12. Type **copy run start** and press Enter.

    Answer **yes** to overwrite.

See the *Converged Enhanced Ethernet Administrator's Guide* for information about CEE CLI interface and configuring switches for FCoE operation and the *Converged Enhanced Ethernet Command Reference* for more details on the commands.

Backing up the configuration

Perform these steps to back up the switch module configuration to an FTP server.

1. Open a Telnet or SSH session to the switch module.
2. Enter **configUpload**.

    You are then presented with a series of prompts.
3. Follow the prompts to upload the configuration.

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

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

For specific instructions about how to back up the configuration, refer to the *Fabric OS Administrator's Guide*. The **switchShow**, **fabricShow**, and **configUpload** commands are described in detail in the *Fabric OS Command Reference*.

Resetting the Brocade FCoE Switch Module to factory defaults

ATTENTION
Restoring the switch module to factory defaults is disruptive. Before beginning, make sure that any program using the high speed switch module has an alternate path to the storage and save the switch module configuration. If the high speed switch module is connected to an existing SAN, disconnect the switch module from the SAN before restoring to factory defaults and then follow proper setup procedures before reconnecting.

Use the Management Module to reset the high speed switch module to factory defaults.

1. Open the Management Module and log in with admin privileges.
2. Select **I/O Module Tasks** > **Configuration**.
3. Select either bay 7 or bay 9 depending on where the switch module is installed.
4. Select **Advanced Configuration**.
5. Click **Restore Defaults**.

Chapter 7. Understanding Access Gateway

The Brocade FCoE Switch Module can function in either Fabric OS Native mode or Brocade Access Gateway (AG) mode. Brocade Access Gateway is a Fabric OS feature that lets you configure your Enterprise fabric to handle additional N_Ports instead of domains. By reducing the number of domain IDs and ports you simplify configuration and management in a large fabric.

NOTE
The Brocade FCoE Switch Module cannot be used as a core AG, only as an edge AG. However, there is no limit as to how many Brocade FCoE Switch Modules can be connected to a core AG.

Switch modules in AG mode are logically transparent to the host and the fabric. You can increase the number of hosts that have access to the fabric without increasing the number of switch modules.

The switch is shipped in Fabric OS Native mode by default.

- For a list of available features in Access Gateway mode, refer to the *Brocade Access Gateway Administrator's Guide* and the Release Notes accompanying the Brocade FCoE Switch Module.
- You can enable AG mode using Fabric OS commands or Web Tools.
- When you enable AG mode, you can use the default F_Port-to-N_Port mappings or change this mapping using command line interface (CLI) or Web Tools after you configure an IP address.
- AG simplifies SAN deployment by using N_Port ID Virtualization (NPIV). NPIV provides Fibre Channel switch functions that improve switch scalability, manageability, and interoperability. For more information on AG, refer to the following:
  - For general information and details on using Access Gateway, refer to the *Brocade Access Gateway Administrator's Guide* and the Release Notes accompanying the Brocade FCoE Switch Module.
  - For specific instructions to prepare the edge fabric before connecting it to Access Gateway (since Access Gateway relies on NPIV technology for its connection to the edge fabric), refer to the *SAN TECH NOTE – Preparing to Install the Brocade Access Gateway)*.

  NOTE
  An Access Gateway cannot be connected directly into an array; it requires a fabric to support NPIV.

- In Fabric OS Native mode, the switch provides up to eight external Fibre Channel ports. These universal and self-configuring ports are capable of becoming one of the following port types:
  - F_Port (fabric enabled)
  - FL_Port (fabric loop enabled)
  - E_Port (expansion port)
  - M_Port (mirror port)
- In AG mode, the switch also provides up to eight external Fibre Channel ports. However, these ports are configured as N_Ports, and you cannot reconfigure these as any other port type.

Unlike AG in pure FC switches, port mapping in the high speed switch module proceeds from CEE ports to (internal) FCoE ports to FC ports. Since there are 22 CEE ports (both internal and external) and 22 FCoE ports (as a bridge from the CEE side of the high speed switch module to the FC side, the port mapping is one-to-one and no user configuration is required. The 22 FCoE ports, however, must be mapped to the 8 external FC ports. In AG mode the FCoE ports are functionally equivalent to F_Ports and the FC ports are configured as N_Ports. The default port mapping configuration assigns three F_Ports to each N_Port. However, in the high speed switch module you are not restricted to this kind of grouping. You can assign any F_Port to any one of the N_Ports manually through the CLI.

Disabling and enabling Access Gateway mode

This section provides steps to disable and enable Access Gateway mode using Fabric OS commands. For more information on using these commands, refer to the "Enabling and disabling Access Gateway mode" section in the *Brocade Access Gateway Administrator's Guide* or the *Brocade Fabric OS Administrator's Guide*.

NOTE
You can also disable and enable Access Gateway mode using Web Tools. Refer to the See the *Web Tools Administrator's Guide* for more information.

Enabling Access Gateway mode

Note the following when enabling AG mode:

- After you enable AG mode, some fabric information is erased, such as the zone and security databases.
- Enabling AG mode is disruptive because the switch is disabled and rebooted.
- Ensure that no zoning or Admin Domain (AD) transaction buffers are active. If any transaction buffer is active, enabling Access Gateway mode will fail with the error, "Failed to clear Zoning/Admin Domain configuration."

Use the following steps to enable AG mode using Fabric OS commands. For more information on enabling AG mode, refer to "Enabling and disabling Access Gateway mode" in the *Brocade Access Gateway Administrator's Guide*.

1. Access the CLI for the high speed switch module.
2. Before disabling a switch to enable Access Gateway mode, save the current configuration file using the **configUpload** command in case you might need this configuration again.
3. Enter the **switchShow** command to verify the switch mode.
    - "Access Gateway Mode" displays for switchMode if the switch is in AG mode.
    - "Native" displays for switchMode if the switch is in Fabric OS Native mode.
4. Enter **switchDisable** to disable the switch. AG mode can only be enabled or disabled when the switch is in a disabled state.
5. Enter **ag –modeEnable** to enable AG mode.
6. The switch reboots at this point so you must log back in to the switch.
7. Enter the **ag --modeShow** command to verify that AG mode is enabled.

```
switch:admin> ag --modeshow
Access Gateway mode is enabled.
```

Once AG mode has been enabled, complete the AG configuration. See the *Brocade Access Gateway Administrator's Guide* and the Release Notes accompanying the Brocade FCoE Switch Module for details. You should be aware of some operational restrictions in AG on the high speed switch module.

- If an N_Port becomes unreliable, its currently active online F_Ports DO NOT failover to another N_Port. They remain on the unreliable N_Port.
- The Brocade FCoE Switch Module can support only one FCoE VLAN in AG mode.
- QoS is NOT disabled on the N_Ports.

The following features are not supported:

- Virtual fabrics
- Admin domains
- Port-based zoning
- QoS zoning
- Hot code load (HCL)
- FC-SP

Disabling Access Gateway mode

When you disable Access Gateway mode, the switch automatically reboots and comes back online using the fabric switch configuration. The Access Gateway parameters, such as F_Port-to-N_Port mapping, failover, and failback are automatically removed. When the switch reboots, it starts in Fabric OS Native mode. To re-join the switch to the core fabric, refer to the *Brocade Access Gateway Administrator's Guide*.

Use the following steps to disable Access Gateway mode using Fabric OS commands. For more information, refer to the "Enabling and disabling Access Gateway mode" section in the *Brocade Access Gateway Administrator's Guide*.

1. Enter the **switchShow** command to verify the switch mode.

   "Access Gateway Mode" displays when the switch is in Access Gateway mode.

2. Enter **switchDisable** to disable the switch. Access Gateway mode can only be disabled or enabled when the switch is in a disabled state.
3. Enter **ag –modeDisable** to disable Access Gateway mode.
4. The switch reboots at this point so you must log back in to the switch.
5. Enter the **ag --modeShow** command to verify that AG mode is disabled.

   ```
   switch:admin> ag --modeshow
   Access Gateway mode is NOT enabled
   ```

Chapter 8. Updating the firmware

This chapter describes how to determine the level of the firmware that is installed on the switch module, how to obtain the latest level of switch firmware, and how to reset the switch module to activate the firmware upgrade.

Determining the level of switch module firmware

After you install the switch module in the BladeCenter unit, make sure that the latest firmware is installed on the switch module. To determine the level of the firmware that is installed, complete the following steps:

1. Log on to the management module as described in the *IBM BladeCenter Advanced Management Module User's Guide*. If necessary, obtain the IP address of the management module from your system administrator. The login window opens.
2. From the **Monitors** menu, click **Firmware VPD**. The Firmware VPD window opens.
3. In the **I/O Module Firmware VPD** area, locate the number of the I/O-module-bay that contains the switch module that you installed; then, note the corresponding level of the firmware for the switch module displayed under the Revision column.

Obtaining the latest level of switch firmware

The switch module might have features that are not described in the documentation that comes with the switch, and the documentation might be updated occasionally to include information about those features or technical updates.

If firmware and documentation updates are available, complete the following steps:

NOTE
Changes are made periodically to the IBM Web site. The procedure for locating firmware and documentation might change from what is described in this document.

---

1. Go to http://www.ibm.com/systems/support/.
2. Under **Choose Support Type**, click **BladeCenter**.
3. Under Product Family menu select BladeCenter H Chassis. Leave other fields as default.
4. Scroll down to view the results.

The switch module can contain two operating-system images. You can revert to the previous image if the current download process fails.

Downloading the firmware

Once you have found the correct firmware you want to download to the Brocade FCoE Switch Module, you can use either the CLI or Web Tools to do the download.

NOTE
The firmware download for the Brocade FCoE Switch Module is not non-disruptive. Be sure that no traffic is flowing through the switch during the download process.

For specifics on how to perform the firmware download, please see the chapters regarding firmware maintenance in the *Fabric OS Administrator's Guide* if you are using the CLI to do the download or the *Web Tools Administrator's Guide* if you are using Web Tools.

Resetting and restarting the switch module

To activate the new image or images, you must reset the switch module. To reset the switch module, complete the following steps:

1. From the **I/O Module Tasks** menu, click **Admin/Power/Restart**. The management module window opens.
2. Select the I/O-module bay on which the firmware update was just installed.
3. Click **Power Off Module(s)**.
4. Select the I/O-module bay on which the firmware update was just installed.
5. Click **Power On Module(s)**. Wait 60 seconds for POST to be completed.
6. Click **Monitors**, and select **Firmware VPD**. The Firmware VPD window opens.
7. In the Firmware VPD window, locate the **I/O Module Firmware VPD** area.

Page down to the number of the I/O-module bay that contains the switch module that you just installed; then, note the corresponding level of the firmware for the switch module. Confirm that the firmware build ID and revision reflect the correct firmware release.

Chapter 9. Parts

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit (CRU):** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty, see the IBM *Warranty and Support Information* document on the IBM Documentation CD.

The replaceable components in the following table are Tier 1 CRUs. If other BladeCenter components require replacement, see the following documentation that comes with these devices:

- BladeCenter *Problem Determination and Service Guide* or *Hardware Maintenance* Manual and Troubleshooting Guide
- *Installation and User's Guide* or *Installation Guide*

TABLE 6 Parts listing

Part	CRU number (Tier 1)
Brocade FCoE Switch Module for IBM BladeCenter	• 69Y1909 (Option) • 69Y1911 (Tier 1 CRU)

Chapter 10. Solving problems

This section provides basic troubleshooting information to help you solve some problems that might occur while you are setting up the switch module.

If you cannot locate and correct a problem by using the information in this section, see Appendix A, “Getting help and technical assistance,” on page 43.

Running POST

To ensure that it is fully operational, the switch module processes a series of tests during power-up or a restart (power-on self-test, or POST). These tests take approximately 1 minute to complete. The management module reads the test results and displays them for you. During normal operation, these tests are completed without error, and the green OK LED is lit. However, if the switch module fails POST, the amber switch module error LED and the system-error LED on the BladeCenter unit are lit. An event is stored in the event log in the system status panel of the management module. The specific failure is displayed on the system status I/O module panel of the management module.

Note: For the locations and descriptions of the switch module LEDs, see , “Chapter 5. Information panels, LEDs, and external ports” on page 23.

POST errors

There are two types of errors: noncritical and critical. A noncritical error applies to one port, and the switch module is operational. You can continue to operate the switch module; however, you must replace it as soon as possible. When critical errors occur, the switch module does not operate. To view POST results, complete the following steps:

1. Log on to the management module as described in the *IBM BladeCenter Advanced Management Module Command-Line Interface Reference Guide*. If necessary, obtain the IP address of the management module from your system administrator. The login window opens.
2. Turn off the power to the switch module; then, turn it on again.
3. After POST is completed, the management module displays the results. Refresh the window to view the POST results. If a critical error occurs, replace the switch module. If a noncritical error occurs, see the switch module error log for additional details.

Table 7 describes the basic critical and noncritical failures. This abbreviated list is representative; it is not an exhaustive list. An error code is associated with each failure. Error codes are displayed on the Management Module Switch Information window. Be sure to note the applicable error code and corresponding failure. You might have to provide this information when you call for service. For details, see “Appendix A. Getting help and technical assistance” on page 45.

TABLE 7 Error listing

Diagnostic indicator (in hex)	Failing functional area	Failure criticality
00 - 7F	Base internal functions	Critical
80 - 9F	Internal interface failures	Noncritical
A0 - AF	External interface errors	Noncritical
B0 - FE	Reserved	Noncritical
FF	Switch module “good” indicator	Operation

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Problem Determination and Service Guide* on the IBM *Documentation* CD that comes with your system.
- Go to the IBM support Web site at http://www.ibm.com/systems/support/ to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to http://www.ibm.com/systems/support/ and follow the instructions. Also, some documents are available through the IBM Publications Center at http://www.ibm.com/shop/publications/order/.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM systems, optional devices, services, and support. The address for IBM System x® and xSeries® information is http://www.ibm.com/systems/x/. The address for IBM BladeCenter information is http://www.ibm.com/systems/bladecenter/. The address for IBM IntelliStation® information is http://www.ibm.com/intellistation/.

You can find service information for IBM systems and optional devices at http://www.ibm.com/systems/support/.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with System x and xSeries servers, BladeCenter products, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, see http://www.ibm.com/services/, or see http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to http://www.ibm.com/partnerworld/ and click **Find a Business Partner** on the right side of the page. For IBM support telephone numbers, see http://www.ibm.com/planetwide/. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

IBM Taiwan product service

台灣 IBM 產品服務聯絡方式：
台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:

IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
Telephone: 0800-016-888

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Processor speed indicates the internal clock speed of the microprocessor; other factors also affect application performance.

CD or DVD drive speed is the variable read rate. Actual speeds vary and are often less than the possible maximum.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity can vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives that are available from IBM.

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Avis de conformité à la réglementation d'Industrie Canada

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

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- EN55022:2006 + A1:2007 (European Emissions Requirements)
- EN55024:1998, +A1:2001 and +A2:2003 (European Immunity Requirements)

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

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Responsible manufacturer:

International Business Machines Corp.
New Orchard Rd.
Armonk, NY, 10504
914-499-1900

European Community contact:

IBM Technical Regulations, Department 456
IBM-Allee 1, 71137 Ehningen, Germany
Telephone: +49 7032 15-2937
E-mail: tjahn@de.ibm.com

Germany Electromagnetic Compatibility Directive

Deutschsprachiger EU Hinweis:

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De verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland
IBM Technical Regulations, Department 456
IBM-Allee 1, 71137 Ehningen, Germany
Telephone: +49 7032 15-2937
E-mail: tjahn@de.ibm.com

Generelle Informationen:

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This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

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Please note that this equipment has obtained EMC registration for commercial use. In the event that it has been mistakenly sold or purchased, please exchange it for equipment certified for home use.

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радиопомехи, для снижения которых необходимы
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People's Republic of China Class A warning statement

中华人民共和国“A类”警告声明

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種情況下，使用者會被要
求採取某些適當的對策。

Appendix C. Product Specifications

Switch components

The Brocade FCoE Switch Module switch includes the following components:

- Up to 14 internal ports as licensed
- Sixteen external ports; eight CEE, eight FC
- Two internal full duplex 100 Mbps Ethernet links for connecting to the two BladeCenter Management Modules
- One external RJ-45 Ethernet port
- One external mini-USB console port
- Two LEDs (status, RX/TX) per external port, one switch power LED, one switch status LED
- Dual fuse circuit
- One temperature sensor

Weight and physical dimensions

Table 8 lists the physical characteristics of the high speed switch module.

TABLE 8 Switch module specifications

Characteristic	Description
Height	4.10 cm (1.61 inches)
Width	29.38 cm (11.57 inches)
Depth	25.70 cm (10.12 inches)
Weight	approximately 2.13 kg (4.7 lb)

High speed switch module memory

The memory installed in the high speed switch module is shown in Table 9.

TABLE 9 Memory specifications

Memory type	Value
FS8548 processor	1.2 GHz
DDR2 SDRAM Bus	1 GB running at 266 MHz with optional ECC support
Boot flash	4 MB
Compact flash	1 GB

Environmental requirements

The information in Table 10 shows the operating and nonoperating requirements of the high speed switch module.

TABLE 10 Environmental requirements

Condition	Operating	Non-operating
Temperature (low altitude)	0° to 40° C (32° to 104° F)	-20° to 70° C (-4°F to 158° F)
Humidity	10% to 90% RH non-condensing at 29° C	5% to 95% RH non-condensing at 38° C
Altitude	up to 3.048 km (10,000 ft) above sea level	up to 10.688 km (35,000 ft) above sea level
Shock	20G, 6ms	50G with a velocity change of 4216 mm/sec squared
Vibration	0.4G, 5-500 Hz, 60 minutes	0.5G, 2-200 Hz, 15 minutes; 1.04 GRMS Random for 15 minutes

CNA support

You can obtain up-to-date information about compatible CNA adapters and other IBM products at http://www.ibm.com/systems/support/.

Fibre Channel Standards Compliance

The switch module meets or exceeds the Fibre Channel standards compliance, performance, and feature capabilities as defined in the following standards when in fabric mode:

- FC-GS-5 ANSI INCITS 427:2006 (includes the following)
  - FC-GS-4 ANSI INCITS 387:2004
- FC-IFR Rev 1
- FC-SW-4 INCITS 418:2006 (includes the following)
  - FC-SW-3 INCITS 384:2004
- FC-VI INCITS 357:2002
- FC-TAPE INCITS TR-24:1999
- FC-DA INCITS TR-36:2004 (includes the following)
  - FC-FLA INCITS TR-20:1998
  - FC-PLDA INCITS S TR-19:1998
- FC-MI-2 ANSI INCITS TR-39:2005
- FC-PI INCITS 352:2002
- FC-PI-2 INCITS 404-2005
- FC-FS-2 ANSI INCITS 424:2006 (includes the following)
  - FC-FS INCITS 372:2003
- FC-LS rev 1.51 (under development)
- FC-BB-3 INCITS 414:2006 (includes the following)
  - FC-BB-2 INCITS 372:2003
- FC-SB-3 INCITS 374:2003 (replaces FC-SB ANSI X3.271:1996; FC-SB-2 INCITS 374:2001)
- RFC-2625 IP and ARP over FC
- RFC 2837 Fabric Element MIB
- MIB-FA INCITS TR-32:2003
- FCP-2 INCITS 350:2003 (replaces FCP ANSI X3.269:1996)
- SNIA Storage Management Initiative Specification (SMI-S) ver 1.2 (includes the following)
  - SNIA SMI-S ver 1.02 (ANSI INCITS 388:2004)
  - SNIA SMI-S ver 1.1.0

The switch module meets or exceeds the Fibre Channel standards compliance, performance, and feature capabilities as defined in the following standards when in NPIV mode (Access Gateway):

- FC-GS-5 ANSI INCITS 427:2006 (includes the following)
  - FC-GS-4 ANSI INCITS 387:2004
- FC-VI INCITS 357:2002
- FC-TAPE INCITS TR-24:1999
- FC-MI-2 ANSI INCITS TR-39:2005
- FC-PI INCITS 352:2002
- FC-PI-2 INCITS 404-2005
- FC-FS-2 ANSI INCITS 424:2006 (includes the following)
  - FC-FS INCITS 373:2003
- FC-LS rev 1.62
- RFC-2625 IP and ARP over FC
- RFC 2837 Fabric Element MIB
- MIB-FA INCITS TR-32:2003
- FCP-3 INCITS 416:2006 (replaces FCP ANSI X3.269:1996)

Regulatory Compliance

The high speed switch module has been approved for use only in the IBM BladeCenter H or BladeCenter HT product as a component by TUV.

CAUTION: RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

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