IBM BladeCenter Virtual Fabric 10Gb Switch Module

Installation Guide

IBM BladeCenter Virtual Fabric 10Gb Switch Module

Installation Guide

Note: Before using this information and the product it supports, read the *Warranty Information* document, the general information in Appendix B, "Notices," on page 37, and the *Important Notices* document that comes with the product. Read the IBM *Systems Safety Notices* and the *License Agreement for Machine Code (LAMC)* document on the IBM *Documentation* CD. Read the *Environmental Notices and User Guide* on the IBM *Environmental Notices* CD.

Third Edition (June 2012)

Contents

Safety v

Chapter 1. The IBM BladeCenter Virtual Fabric 10Gb Switch Module 1
Specifications 3
Related documentation 3
Inventory checklist 4
Notices and statements in this document 4
Major components of the switch module 5

Chapter 2. Installing and replacing a switch module 7
Installation guidelines 8
System reliability guidelines 8
Handling static-sensitive devices 9
Installing a switch module 10
Removing or replacing a switch module 12

Chapter 3. Installing and removing a 10 Gb SFP+ module 15
Handling an SFP+ module 15
Installing an SFP+ module 17
Removing an SFP+ module 18

Chapter 4. Cabling the switch module and the SFP+ module 19
Connecting the serial console cable 19
Disconnecting the serial console cable 19
Connecting the SFP+ module cable 20
Disconnecting the SFP+ module cable 20
Connecting the RJ-45 cable 21
Disconnecting the RJ-45 cable 21

Chapter 5. Updating the software and configuring the switch module 23

Chapter 6. Information panels, LEDs, and external ports 25
Information panel 25
Information LEDs 26
Switch-module status LEDs 27
Port status LEDs 27

Chapter 7. Parts listing 29

Chapter 8. Solving problems 31
Running POST 31
POST errors 31

Appendix A. Getting help and technical assistance 33
Before you call 33
Using the documentation 34
Getting help and information from the World Wide Web 34
How to send Dynamic System Analysis data to IBM 34
Creating a personalized support web page 34
Software service and support 35
Hardware service and support 35
IBM Taiwan product service 35

Appendix B. Notices 37
Trademarks 37
Important notes 38
Particulate contamination 39
Documentation format 39
Telecommunication regulatory statement 40
Electronic emission notices 40
Federal Communications Commission (FCC) statement 40
Industry Canada Class A emission compliance statement 40
Avis de conformité à la réglementation d'Industrie Canada 40
Australia and New Zealand Class A statement 40
European Union EMC Directive conformance statement 41
Germany Class A statement 41
Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten 41
Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A 42
VCCI Class A statement 42
Japan Electronics and Information Technology Industries Association (JEITA) statement 42
Korea Communications Commission (KCC) statement 42
Russia Electromagnetic Interference (EMI) Class A statement 43
People's Republic of China Class A electronic emission statement 43
Taiwan Class A compliance statement 43

Index 45

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 ασφάλειας
(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 *Systems Safety Notices* document.

For example, if a caution statement is labeled "Statement 1," translations for that caution statement are in the *Systems Safety Notices* 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 3:

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

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.

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À 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. The IBM BladeCenter Virtual Fabric 10Gb Switch Module

The IBM® BladeCenter® Virtual Fabric 10Gb Switch Module is a high-speed Ethernet component that is installed into a BladeCenter unit that supports high-speed I/O modules.

This *Installation Guide* contains instructions for and information about:

- Setting up and installing or replacing the IBM BladeCenter Virtual Fabric 10Gb Switch Module
- Installing and removing optional devices in the switch module
- Using the information panel, LEDs, and external ports on the switch module
- Cabling the switch module and its optional devices
- Configuring the switch module
- Updating the switch-module software
- Solving problems with the switch module

For installation instructions, see Chapter 2, "Installing and replacing a switch module," on page 7 and Chapter 3, "Installing and removing a 10 Gb SFP+ module," on page 15. For additional information about switch modules and other BladeCenter components, see the BladeCenter documentation that comes with these devices.

To support each IBM BladeCenter Virtual Fabric 10Gb Switch Module that you install in the BladeCenter unit, you must also install a compatible high-speed Ethernet expansion card (also known as an Ethernet I/O card) in each blade server that you want to communicate with the switch module. In this environment, the expansion card operates as a host channel adapter (HCA). For additional information, see Chapter 2, "Installing and replacing a switch module," on page 7 and the installation information for the Ethernet expansion card.

For information about the types of compatible expansion cards for the blade server, contact your IBM marketing representative or authorized reseller. For a list of supported optional devices for the blade server, see http://www.ibm.com/servers/eserver/serverproven/compat/us/. For details about compatible expansion card installation, configuration, and use, see the documentation that comes with the adapter.

You can obtain up-to-date information about the switch module at http://www.ibm.com/systems/bladecenter/.

Notes:

1. Throughout this document, the IBM BladeCenter Virtual Fabric 10Gb Switch Module is referred to as the high-speed switch module, the HSSM, the switch module, or the I/O module.
2. Unless otherwise stated, references to the BladeCenter unit apply to all BladeCenter units that support high-speed I/O modules, such as the BladeCenter H unit.

3. Changes are made periodically to the IBM Web site. Procedures for locating firmware and documentation might vary slightly from what is described in this document.
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 switch module.

The switch module has the following components:

- Fourteen internal 10 Gb ports, one connected to each of the blade servers in the BladeCenter unit
- Two internal 1 Gb ports to connect to the management module
- Ten external 10 Gb user ports for connecting small-form-factor pluggable (SFP+) modules
- One external 1 Gb Ethernet port
- One external RS-232 serial port for management use

You can manage and configure the switch module through multiple interfaces:

- A Telnet connection to the embedded command-line interface (CLI)
- A terminal emulation program connection to the serial-port interface
- A Web browser-based interface (BBI) connection to the switch module

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/mynotifications/.

Product name	IBM BladeCenter Virtual Fabric 10Gb Switch Module
Model number	_____
Serial number	_____
Part number	_____
Media access control (MAC) address for switch module	_____
MAC addresses for other components	_____
	_____
	_____

Specifications

For detailed information about the switch-module hardware and software features, specifications, and standards, see the switch module *Application Guide*.

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-947.ibm.com/support/entry/portal/documentation/ enter the name of your product in the **Quick Find** field and press **Enter**. Also, some hardcopy documents are available through the IBM Publications Center at http://www.elink.ibmlink.ibm.com/public/applications/publications/cgibin/pbi.cgi.
- Depending on your blade server model, additional documentation might be included on the IBM BladeCenter *Documentation* CD for your IBM BladeCenter unit type.

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* or *BladeCenter T 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
- *Systems Safety Notices*
- *Broadcom 10 Gb 2-Port and 4-Port Ethernet Expansion Cards (CFFh) for IBM BladeCenter Installation and User's Guide*
- *Application Guide for the IBM BladeCenter Virtual Fabric 10Gb Switch Module*
- *BBI Quick Guide for the IBM BladeCenter Virtual Fabric 10Gb Switch Module*
- *Menu-Based CLI Command Reference for the IBM BladeCenter Virtual Fabric 10Gb Switch Module*
- *ISCLI-Industry Standard CLI Command Reference for the IBM BladeCenter Virtual Fabric 10Gb Switch Module*

See the IBM *Configuration and Options Guide* for information about which SFP+ module and cable are required to connect the switch module to other network devices. This document is available in both HTML and Portable Document Format (PDF) from http://www-03.ibm.com/systems/xbc/cog/search.html.

For more information about documentation requirements, see "Using the documentation" on page 34.

Inventory checklist

Make sure that the shipping carton contains the following items:

- One switch module
- One filler module
- One IBM *Documentation* CD which includes the *IBM BladeCenter Virtual Fabric 10Gb Switch Module Installation Guide* (this document)
- One *Environmental Notices* CD
- One *Warranty* document
- One *Important Notices* document

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 *Systems Safety Notices* 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 *Systems Safety Notices* document.

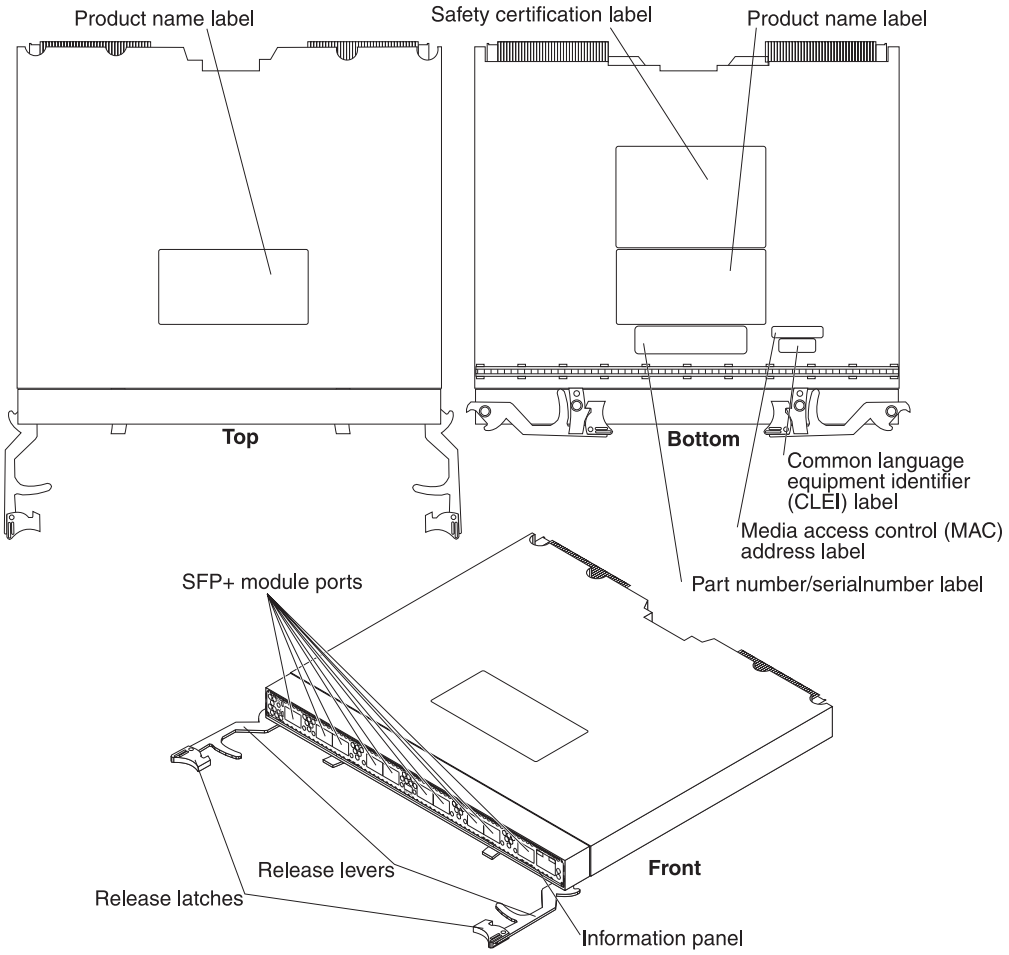
The following notices and statements are used in this document:

- **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, and your switch module might have labels that are not shown in the illustrations in this document.

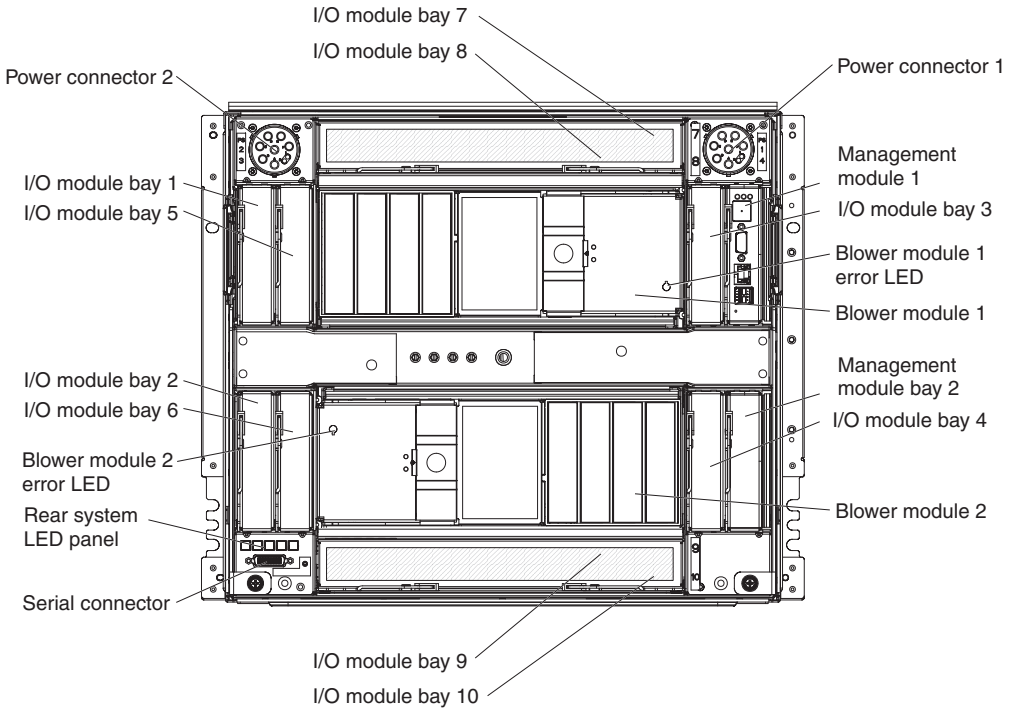


For more information about the components of the information panel, see Chapter 6, “Information panels, LEDs, and external ports,” on page 25.

Chapter 2. Installing and replacing a 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 I/O-module bay locations and the components that can be installed in them that is specific to your BladeCenter unit type.

The following illustration shows an example of a BladeCenter unit with the I/O-module bays identified. In this example, these bays are in the rear of the BladeCenter chassis. In a different type of BladeCenter unit, the bays might be in a different location.



An expansion card or host channel adapter (HCA) 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.

The BladeCenter unit supports a maximum of four IBM BladeCenter Virtual Fabric 10Gb Switch Modules. Depending on the type of BladeCenter unit that you are using, the BladeCenter unit supports a maximum of 10 or 14 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 I/O-module bay 7 or 9.
- When the switch module is installed in a BladeCenter unit, the internal ports operate at 10 Gbps. The external ports can operate at 10 Gbps or 1 Gbps, depending on the SFP module type.
- 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 9, 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 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-03.ibm.com/systems/xbc/cog/search.html. 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.

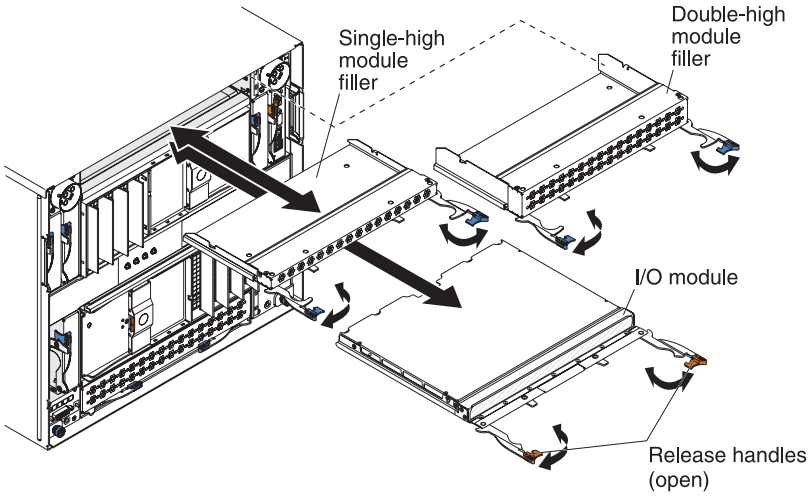
To reduce the possibility of electrostatic discharge, observe the following precautions:

- 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. Read the safety information that begins on page v and "Installation guidelines" on page 8.
2. Select I/O-module bay in which to install the switch module.

   Note: For details about I/O-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.
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 the removed filler module (from step 3) occupied two bays:
   - Remove the single-high filler module from its static-protective package.
   - Install the single-high filler module into the unused bay.
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 I/O-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:

a. 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.

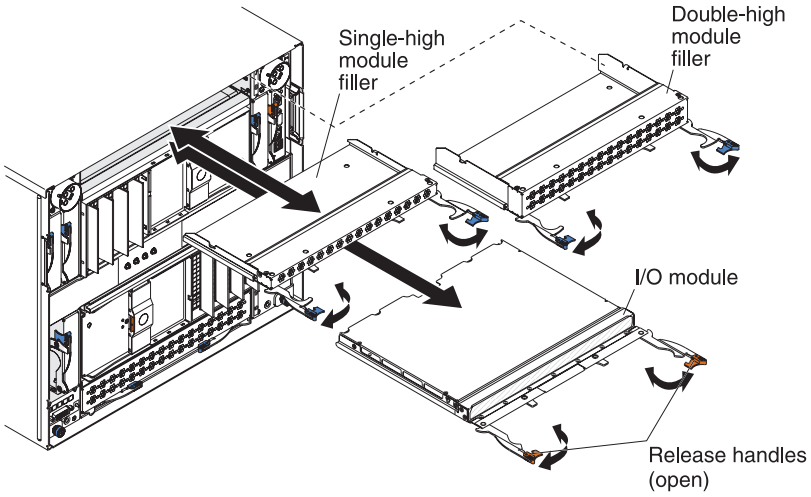
b. To maintain proper airflow, make sure that the ventilation holes on the front of the switch module are not blocked.

10. Make sure that the LEDs on the switch module indicate that it is operating correctly (see "Information LEDs" on page 26).
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 the SFP+ modules in the switch module. For information and instructions, see Chapter 3, "Installing and removing a 10 Gb 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. Read the safety information that begins on page v, and "Installation guidelines" on page 8.
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 9 and 10 on page 11.)
6. If you placed a filler module in the bay, continue with Chapter 3, "Installing and removing a 10 Gb SFP+ module," on page 15.
7. 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 a 10 Gb SFP+ module,” on page 15.

Chapter 3. Installing and removing a 10 Gb SFP+ module

The switch module supports both the 10 Gb small-form-factor pluggable (SFP+) module and the 1 Gb small-form-factor pluggable (SFP) module. The SFP+ and SFP modules 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.

Notes:

1. The illustrations in this document might differ slightly from your hardware.
2. While the information in this section describes the 10 Gb small-form-factor pluggable (SFP+) module, it also applies to the 1 Gb small-form-factor pluggable (SFP) module.
3. The switch module also supports MSA-compliant copper direct-attach cables (DAC), up to 7 m (23 ft) in length.

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.

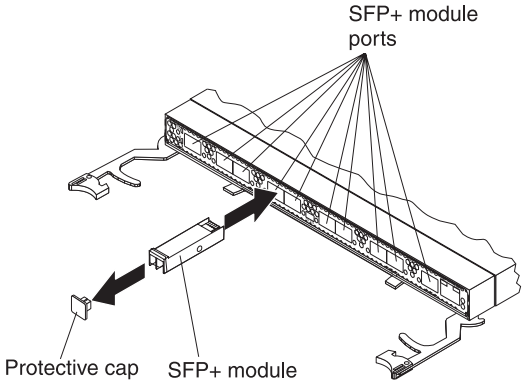
Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

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 v and "Installation guidelines" on page 8.
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 cap, if one is installed, from the SFP+ module 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.



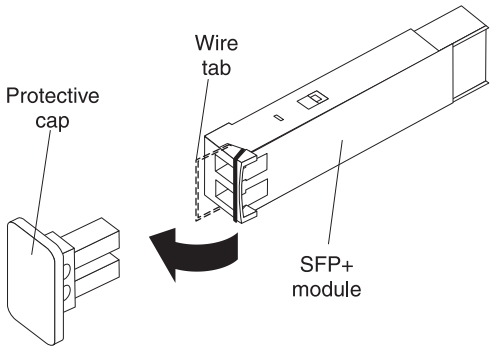
8. Connect the fiber optic cable (see "Connecting the SFP+ module cable" on page 20) and any cables that you disconnected earlier.

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 8.
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 20.

   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.



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 SFP+ module port.
7. Place the SFP+ module into a static-protective package.

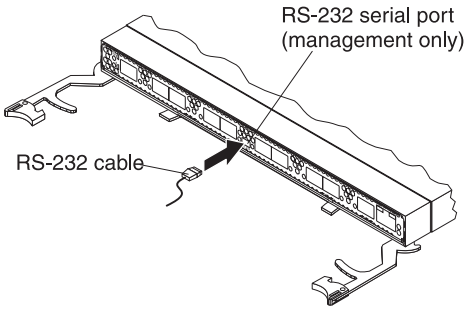
Chapter 4. Cabling the switch module and the SFP+ module

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 serial console cable

To connect the serial console cable to the switch module, connect the serial cable to the RS-232 serial console port of the switch module and the other end of the cable to the console device.



Disconnecting the serial console cable

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

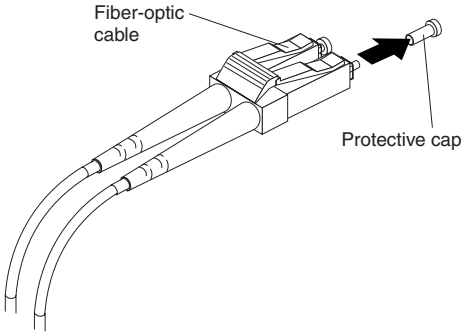
Connecting the SFP+ module cable

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

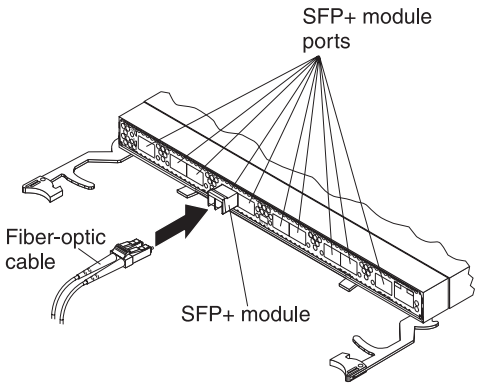
- Do not route the cable along a folding cable-management arm.
- When you attach the cable to a device on slide rails, leave enough slack in the cable so that it does not bend to a radius of less than 38 mm (1.5 in.) when the device is extended or become pinched when the device is retracted.
- Route 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.



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



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 6, “Information panels, LEDs, and external ports,” on page 25.

Disconnecting the SFP+ module cable

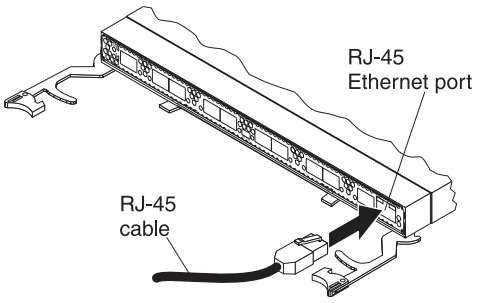
To disconnect the SFP+ module cable, complete the following steps:

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 cable

The RJ-45 cable can be connected to port 11.

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



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. Updating the software and configuring the switch module

Make sure that you are using the latest version of management module firmware for your BladeCenter unit type. See the *Management Module User's Guide* for your unit type, located at http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp for your BladeCenter unit type for additional information.

Make sure that you are using the latest version of the switch module software. For instructions on upgrading the switch module software, see the *Menu-Based CLI Command Reference* or the *ISCLI–Industry Standard CLI Command Reference Guide* at http://www-947.ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-54667.

For instructions on configuring the switch module, see the *IBM BladeCenter Command Reference Guide* for your switch module located at http://www.bladenetwork.net/IBM-BladeCenter-support.html.

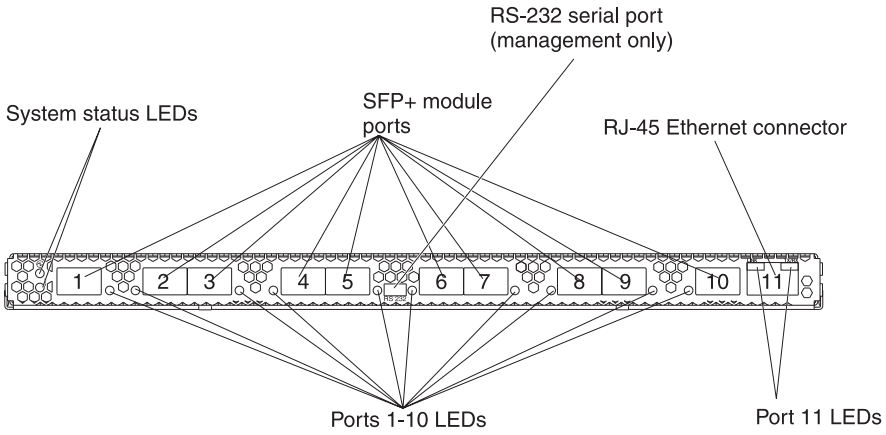
Chapter 6. Information panels, LEDs, and external ports

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, ten SFP+ module port connectors, one RS-232 serial port connector, and one Ethernet port connector, as shown in the following illustration.



The switch-module information panel contains the following components:

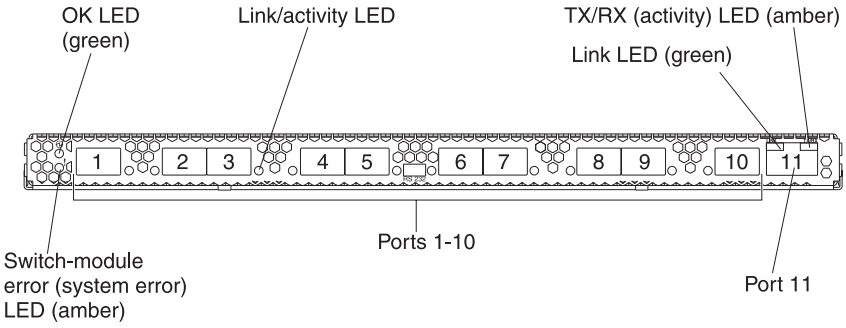
- LEDs that display the following information:
  - The status of the switch module and its network connection
  - The status of the external connections to the switch module

  For further details about LEDs, see "Information LEDs" on page 26.
- Ten SFP+ port connectors to attach SFP+ modules. These connectors are identified as ports EXT1 through EXT10 in the I/O-module configuration menus and are labeled 1 through 10 (from left to right) on the switch module.
- One RS-232 serial port connector for console port use (management purposes) only. This connector is between SFP+ module ports 5 and 6 on the switch module. Do *not* attach any devices to this connector other than the serial cable that comes with the switch module, as described in Chapter 4, "Cabling the switch module and the SFP+ module," on page 19.
- One RJ-45 Ethernet port connector. Do *not* attach any devices to this connector other than a compatible cable. This connector is identified as port EXT11 in the I/O-module configuration menus and is labeled 11 on the switch module.

Information LEDs

The front panel of the switch module has two sets of LEDs. The OK and switch-module error LEDs in the first column at the left of the switch module indicate the switch-module status. The link (LINK) and activity (TX/RX) LEDs indicate the status of the external ports. Ports 1 through 10 have a single LED that indicates both link and activity status. Port 11 has separate link and activity LEDs.

The following illustration shows the locations of the LEDs on the switch module. These LEDs are described in "Switch-module status LEDs" on page 27 and "Port status LEDs" on page 27.



Notes:

- 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 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. For information about the command to read the system log, see the *Menu-Based CLI Command Reference* guide for the switch module

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 1. Switch-module status LEDs

Status LED	Description
OK ( ) LED	This green LED is at the top left of the switch module on the front panel. • When this LED is lit, it indicates that the switch module is on. • When this LED is not lit and the amber switch-module error LED is lit, it indicates a critical alert. If the amber LED is also not lit, it indicates that the switch module is off.
Switch-module error (!) LED	This amber LED is at the bottom left of the switch module on the front panel. • When this LED is lit, it indicates a POST failure or critical alert. **Note:** When this LED is lit, the system-error LED on the BladeCenter unit is also lit. • When this LED is not lit and the green LED is lit, it indicates that the switch module is working correctly. If the green LED is also not lit, 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 2. Port status LEDs

Status LED	Description
Link / Activity LED *(Ports 1 through 10)*	This green LED is on ports 1 through 10. It indicates whether the corresponding port link is up or down and the status of the link activity for the corresponding port. • When this LED is not lit, it indicates that there is no signal on the corresponding port, or the link is down. • When this LED is lit, there is an active connection (or link) between the corresponding port and the device that is using this connection. • When this LED is flashing, the corresponding port is connected and online, and link activity is occurring on that port.
Link (L) LED *(Port 11 only)*	This green LED is on port 11. It indicates whether the port link is up or down. • When this LED is lit, there is an active connection (or link) between the corresponding port and the device that is using this connection. • When this LED is not lit, it indicates that there is no signal on the corresponding port, or the link is down.
Activity (TX/RX) LED *(Port 11 only)*	This amber LED is on port 11. It indicates the status of the link activity for the port. • When this LED is flashing or lit, the corresponding port is connected and online, and link activity is occurring on that port. • When this LED is not lit, it indicates that there is no signal or no link activity on the corresponding port.

Chapter 7. Parts listing

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 *Warranty Information* document.

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*

Part	CRU number (Tier 1)
IBM BladeCenter Virtual Fabric 10Gb Switch Module assembly	46C7194
Serial console cable	43X0510
IBM BladeCenter 10 Gb SFP+ small-form-factor pluggable module, SR (850 nm)	44W4411
I/O module filler, single high	31R3303

Chapter 8. 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. The *Application Guide* for the switch module provides more details about troubleshooting 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 33.

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 6, "Information panels, LEDs, and external ports," on page 25.

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.

The following table 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 33.

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. Use this information to obtain additional information about IBM and IBM products, determine what to do if you experience a problem with your IBM system or optional device, and determine 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.
- Check for updated firmware and operating-system device drivers for your IBM product. The IBM Warranty terms and conditions state that you, the owner of the IBM product, are responsible for maintaining and updating all software and firmware for the product (unless it is covered by an additional maintenance contract). Your IBM service technician will request that you upgrade your software and firmware if the problem has a documented solution within a software upgrade.
- If you have installed new hardware or software in your environment, check http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/ to make sure that the hardware and software is supported by your IBM product.
- Go to http://www.ibm.com/supportportal/ to check for information to help you solve the problem.
- Gather the following information to provide to IBM Support. This data will help IBM Support quickly provide a solution to your problem and ensure that you receive the level of service for which you might have contracted.
  - Hardware and Software Maintenance agreement contract numbers, if applicable
  - Machine type number (IBM 4-digit machine identifier)
  - Model number
  - Serial number
  - Current system UEFI and firmware levels
  - Other pertinent information such as error messages and logs
- Go to http://www.ibm.com/support/entry/portal/Open_service_request/ to submit an Electronic Service Request. Submitting an Electronic Service Request will start the process of determining a solution to your problem by making the pertinent information available to IBM Support quickly and efficiently. IBM service technicians can start working on your solution as soon as you have completed and submitted an Electronic Service Request.

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/supportportal/. 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

Up-to-date information about IBM systems, optional devices, services, and support is available on the World Wide Web at http://www.ibm.com/supportportal/. The address for IBM System x® 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/systems/intellistation/.

How to send Dynamic System Analysis data to IBM

Use the IBM Enhanced Customer Data Repository to send diagnostic data to IBM. Before you send diagnostic data to IBM, read the terms of use at http://www.ibm.com/de/support/ecurep/terms.html.

You can use any of the following methods to send diagnostic data to IBM:

- **Standard upload:** http://www.ibm.com/de/support/ecurep/send_http.html
- **Standard upload with the system serial number:** http://www.ecurep.ibm.com/app/upload_hw
- **Secure upload:** http://www.ibm.com/de/support/ecurep/send_http.html#secure
- **Secure upload with the system serial number:** https://www.ecurep.ibm.com/app/upload_hw

Creating a personalized support web page

At http://www.ibm.com/support/mynotifications/, you can create a personalized support web page by identifying IBM products that are of interest to you. From this personalized page, you can subscribe to weekly email notifications about new technical documents, search for information and downloads, and access various administrative services.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with your IBM products. For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/supline/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 Business Partners** 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

Appendix B. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product, and use of those websites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at "Copyright and trademark information" at http://www.ibm.com/legal/copytrade.shtml.

Adobe and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Cell Broadband Engine is a trademark of Sony Computer Entertainment, Inc., in the United States, other countries, or both and is used under license therefrom.

Intel, Intel Xeon, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Important notes

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.

Maximum memory might require replacement of the standard memory with an optional memory module.

IBM makes no representation or warranties regarding non-IBM products and services that are ServerProven®, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

Some software might differ from its retail version (if available) and might not include user manuals or all program functionality.

Particulate contamination

Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the *** server *** device *** that is described in this document. Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the *** server *** device *** to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment have caused damage to the *** server *** device ***, IBM may condition provision of repair or replacement of *** servers *** devices *** or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 3. Limits for particulates and gases

Contaminant	Limits
Particulate	• The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2[1]. • Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282. • The deliquescent relative humidity of the particulate contamination must be more than 60%[2]. • The room must be free of conductive contamination such as zinc whiskers.
Gaseous	• Copper: Class G1 as per ANSI/ISA 71.04-1985[3] • Silver: Corrosion rate of less than 300 Å in 30 days

[1] ASHRAE 52.2-2008 - *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

[2] The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.

[3] ANSI/ISA-71.04-1985. *Environmental conditions for process measurement and control systems: Airborne contaminants*. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.

Documentation format

The publications for this product are in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when you use the PDF files and want to request a web-based format or accessible PDF document for a publication, direct your mail to the following address:

Information Development
IBM Corporation
205/A015
3039 E. Cornwallis Road
P.O. Box 12195

Research Triangle Park, North Carolina 27709-2195
U.S.A.

In the request, be sure to include the publication part number and title.

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

Telecommunication regulatory statement

This product is not intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks, nor is it intended to be used in a public services network.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital 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, may 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 his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

Attention: This is an EN 55022 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.

Responsible manufacturer:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
914-499-1900

European Community contact:
IBM Technical Regulations, Department M456
IBM-Allee 1, 71137 Ehningen, Germany
Telephone: +49 7032 15-2937
Email: tjahn@de.ibm.com

Germany Class A statement

Deutschsprachiger EU Hinweis:

Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung der IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung der IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden: “Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen.”

Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem “Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)”. Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:
International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
IBM Deutschland
Technical Regulations, Department M456
IBM-Allee 1, 71137 Ehningen, Germany
Telephone: +49 7032 15-2937
Email: tjahn@de.ibm.com

Generelle Informationen:

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

VCCI Class A 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 (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.

Japan Electronics and Information Technology Industries Association (JEITA) statement

高調波ガイドライン適合品

Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)

Korea Communications Commission (KCC) statement

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

This is electromagnetic wave compatibility equipment for business (Type A). Sellers and users need to pay attention to it. This is for any areas other than home.

Russia Electromagnetic Interference (EMI) Class A statement

ВНИМАНИЕ! Настоящее изделие относится к классу А.
В жилых помещениях оно может создавать радиопомехи, для снижения которых необходимы дополнительные меры

People's Republic of China Class A electronic emission statement

中华人民共和国“A类”警告声明

声 明

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

Taiwan Class A compliance statement

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。

Index

A

accessible documentation 39
activity (TX/RX) LED, Ethernet switch module 26
activity (TX/RX) LED, switch module or SFP+ module port 27
activity status, port
  Ethernet switch module 26
  switch module or SFP+ module port 27
adapter, host channel 1
assistance, getting 33
attention notices 4

B

bay locations, BladeCenter unit 7
blade server
  interconnections with expansion card and high-speed switch-modules 1, 7
  network requirements 1
BladeCenter documentation Web site 3

C

cables
  requirements for Ethernet network 11, 12
  requirements for switch modules 9
  serial console
    installing 19
    removing 19
  SFP+ module
    installing 20
    removing 20
cabling
  parts listing 29
  serial console 19
  SFP+ module 20
  switch module 19
caution statements 4
Class A electronic emission notice 40
Common Language Equipment Identification (CLEI) label 5
communication requirements 1, 7, 11
compatible
  BladeCenter options Web site 8
  host channel adapter (HCA) 1
components
  information panel 25
  switch module 5
configuration
  cable requirements 9
  menu 25
  options 3
connecting
  RJ-45 cable 21
  serial console cable 19
  SFP+ module cable 20
contamination, particulate and gaseous 39
critical errors 31

D

danger statements 4
diagnostic data 34
disconnecting
  RJ-45 cable 21
  serial console cable 19
  SFP+ module cable 20
documentation
  cable requirements 9
  related 3
documentation format 39
Dynamic System Analysis 34

E

electronic emission Class A notice 40
enabling management over external ports 11
enabling the external ports 11
error
  critical 31
  noncritical 31
error log
  management module 26
  power-on self-test (POST) 26
Ethernet
  expansion card 1
  LEDs 26, 27
  network requirements 11, 12
  ports 25, 27
Ethernet switch module
  activity (TX/RX) LED 25, 26, 27
  components 5
  error (!) LED 27
  features, specifications, and standards 3
  information panel 25
  installation guidelines 8
  installing 7, 10
  link LED 25, 26, 27
  OK LED 25, 26, 27
  ports 25, 27
  removing or replacing 12
  switch-module error (!) LED 25, 26
event log, management module 26
expansion card
  interconnections with blade server and high-speed switch-modules 1, 7
  network requirements 1, 7
external ports
  enabling 11
  enabling management 11
  Ethernet
    cable requirements 11, 12
external ports *(continued)*
  operating speeds on switch module 8
  status LEDs
    on Ethernet switch module 25, 26
    on switch module or SFP+ module port 27

F

FCC Class A notice 40
features 3
fiber optic cables
  installing 20
  removing 20
filler module
  installation requirements 10
  parts listing 29
front view 25, 26

G

gaseous contamination 39
getting help 33
guidelines
  handling an SFP+ module 15
  handling fiber optic cables 20
  handling static-sensitive devices 9
  installation 8
  system reliability 8

H

handling
  an SFP+ module 15
  fiber optic cables 20
  static-sensitive devices 9
hardware features 3
hardware requirements 1, 7
hardware service and support 35
help, getting 33
high-speed device interconnections 1, 7
high-speed switch-module (HSSM)
  documentation 3
  network requirements 7
host channel adapter (HCA)
  interconnections with blade server and high-speed switch-modules 1, 7
  internal ports 7
  network requirements 1, 7
host channel requirements 1, 7
hot-swap component 8
HSSM (high-speed switch module) 1, 7

I

I/O-module bay locations 7
IBM ServerProven list 8

IBM Support Line 35
identification labels 5
important notices 4
information panel
  Ethernet switch module 25
installation
  guidelines 8
  procedure
    cables 20
    cables for switch module 11, 12
    serial console cable 19
    SFP+ module 17
    SFP+ module cable 20
    switch module 10
  requirements 8
installing
  fiber optic cables 20
  high-speed switch module 7
  host channel adapter 1
  options 8, 15
  SFP+ module 17
  switch module 7, 10
internal ports
  on Ethernet switch module 8
  on host channel adapter 7
inventory checklist 4

L

labels 5
LED
  activity (TX/RX), Ethernet switch module 26
  activity (TX/RX), switch module or SFP+ module port 27
  colors 26
  critical alert 27
  front view 25, 26
  illustration 25, 26
  link, Ethernet switch module 26
  link, switch module or SFP+ module port 27
  locations 25, 26
  OK 25, 26, 27
  port status
    Ethernet switch module 25, 26
    switch module or SFP+ module port 27
  switch module status 25, 26, 27
  switch-module error (!) 25, 26, 27
  system status 25, 26, 27
  system-error 25, 26
link activity status, port
  Ethernet switch module 25, 26
  switch module or SFP+ module port 27
link LED 26, 27
link up/down status, port
  Ethernet switch module 25, 26
  switch module or SFP+ module port 27

M

major components 5
management module
  event log 26
media access control (MAC) address label 2, 5

N

network requirements 1, 7, 11
noncritical errors 31
notes 4
notes, important 38
notices 37
  electronic emission 40
  FCC, Class A 40
notices and statements 4

O

OK LED 25, 26, 27
online product registration 2
options
  BladeCenter Web site 1, 8
  configuring 3
  IBM ServerProven list 8
  installing 8, 15

P

part number label 5
particulate contamination 39
parts listing 29
port fault 27
port link activity status
  Ethernet switch module 25, 26
  switch module or SFP+ module port 27
port link up/down status
  Ethernet switch module 25, 26
  switch module or SFP+ module port 27
port status LEDs
  Ethernet switch module 25, 26
  switch module or SFP+ module port 27
ports
  external
    operating speeds on switch module 8
    status LEDs on Ethernet switch module 25, 26
    status LEDs on switch module or SFP+ module port 27
  internal
    on host channel adapter 7
    operating speeds on switch module 8
power-on self-test (POST)
  completed 11
  description 11
  error log 26
  failure 27
  normal 11, 26
product
  information 1
  name label 5
  registration Web site 2
protocols 3
public services network, use in 40
public telecommunications network, connection to 40
publications
  related 3

R

registration, product 2
related documentation 3
removing
  fiber optic cables 20
  serial console cable 19
  SFP+ module 18
  switch module 12
requirements
  hardware 1
requirements, hardware 7
RJ-45 cable
  connecting 21
  disconnecting 21

S

safety certification label 5
serial console cable
  connecting 19
  disconnecting 19
  parts listing 29
serial number
  label 5
  location of 2
ServerProven list, IBM 8
SFP+ module
  cable, connecting 20
  cable, disconnecting 20
  description 15
  handling 15
  installation procedure 17
  installing 17
  port activity status 27
  port link status 27
  removing 18
small form-factor pluggable module
  removing 18
software features 3
software service and support 35
solving problems 31
specifications 3
standards 3
statements and notices 4
static-sensitive devices, handling 9
status
  port activity
    Ethernet switch module 25, 26
    switch module or SFP+ module port 27
  port link
    Ethernet switch module 25, 26
    switch module or SFP+ module port 27
  system 25, 26, 27
switch module
  cable requirements 9
  cabling 19, 29

switch module *(continued)*
components 5
documentation 3
Ethernet
port status LEDs 25, 26, 27
ports 25
system-status LEDs 25, 26, 27
external ports
enabling 11
features, specifications, and standards 3
high-speed 7
I/O-module bay locations 7
installation guidelines 8
installing 7, 10
interconnections with blade server and expansion card 1
network requirements 1, 11
operating speeds for internal and external ports 8
parts listing 29
product registration 2
removing or replacing 12
status 27
Ethernet switch module 25
switch module 26
switch-module error (!) LED 25, 26, 27
system log 26
system reliability 8
system-error LED 25, 26, 27
system-status LED 25, 26, 27

T

telephone numbers 35
trademarks 37
troubleshooting 31

U

United States electronic emission Class A notice 40
United States FCC Class A notice 40

W

Web site
BladeCenter documentation 3, 9
compatible BladeCenter options 8
IBM product information 1
IBM ServerProven list 1, 8
product registration 2
website
personalized support 34
publication ordering 34
support line, telephone numbers 35

Part Number: 00D9263

Printed in USA

(1P) P/N: 00D9263