IBM iFlow Director

Installation Guide

IBM iFlow Director

Installation Guide

Note: Before using this information and the product it supports, read the *Warranty Information* document and Appendix B, "Notices," on page 49; and read the *IBM Safety Information* and the *IBM Systems Environmental Notices and User Guide* on the IBM *Documentation* CD

First Edition (April 2012)

Contents

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 *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 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. IBM iFlow Director

The IBM iFlow Director is a high-speed Ethernet component that is installed into a BladeCenter® unit that supports high-speed I/O modules. The IBM iFlow Director comes preloaded with iFlow Director firmware. To enable the functionality of iFlow Director, you must install the license, otherwise, iFlow Director behaves as an Ethernet switch module. For more information, see Chapter 7, "Updating the software," on page 35.

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 iFlow Director 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 iFlow Director at http://www.ibm.com/systems/bladecenter/.

Notes:

1. Throughout this document, the iFlow Director 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

  For more information, see Chapter 6, "Configuring the switch module," on page 27.

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 iFlow Director
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.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* 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
- *Safety Information*
- *Broadcom 10 Gb 2-Port and 4-Port Ethernet Expansion Cards (CFFh) for IBM BladeCenter Installation and User's Guide*
- *BNT Application Guide* for the switch module
- *BNT Browser Based Interface Quick Guide* for the switch module
- *BNT Command Reference* for the switch module
- *BNT ISCLI Reference* for the 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.ibm.com/servers/eserver/xseries/cog/.

For more information about documentation requirements, see "Using the documentation" on page 46.

Inventory checklist

Make sure that the shipping carton contains the following items:

- One switch module
- The *IBM iFlow Director* (this document)
- One serial console cable
- One filler module
- Safety flyer
- End User License Agreement

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.

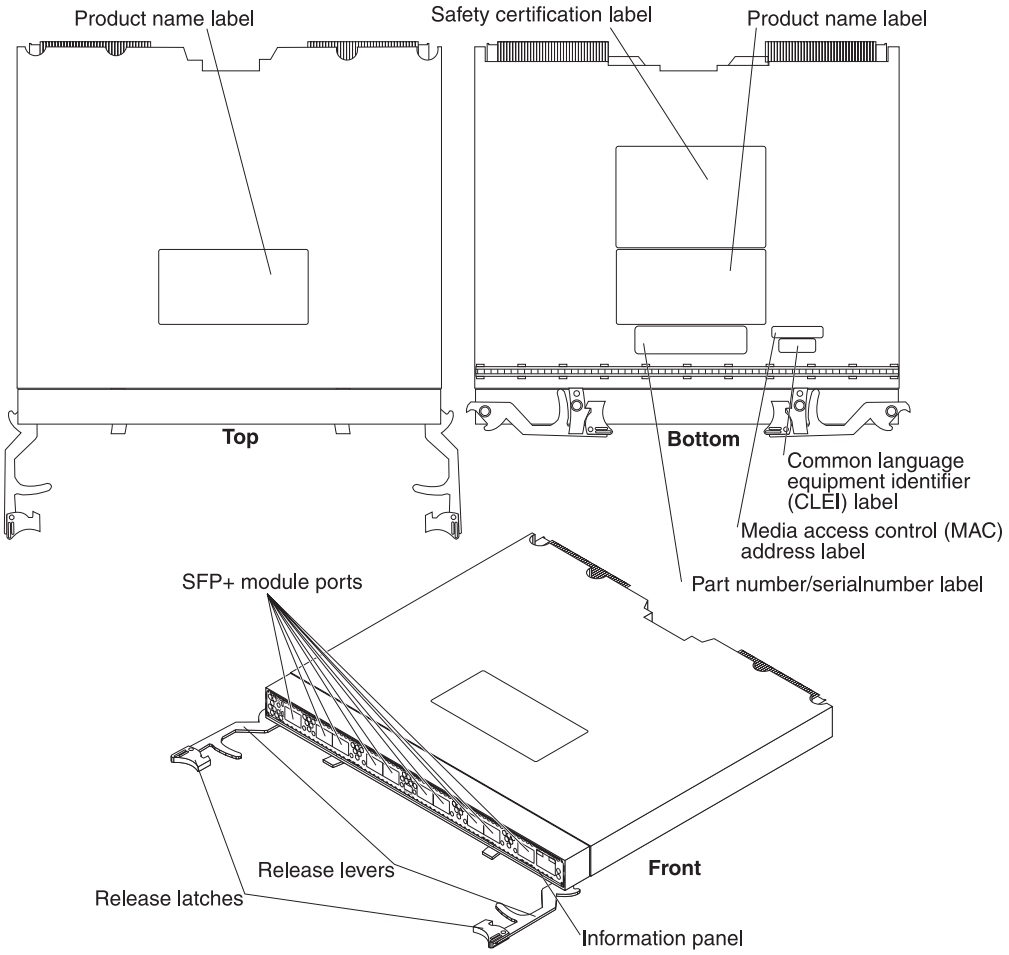
The following notices and statements are used in this document:

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

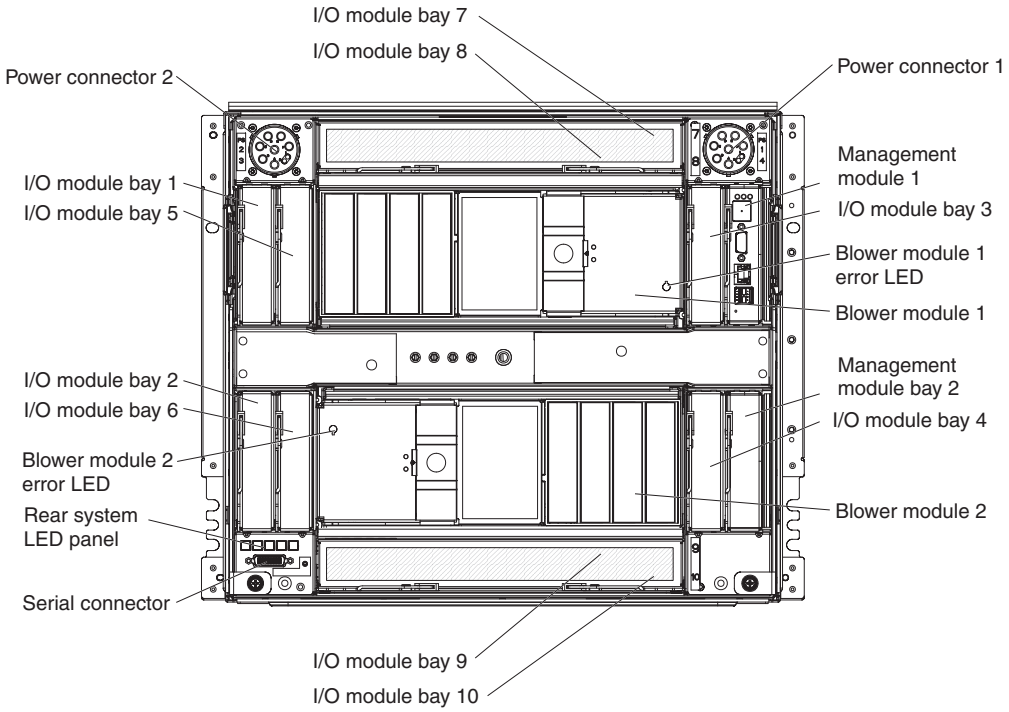


For more information about the components of the information panel, see Chapter 5, “Information panels, LEDs, and external ports,” on page 23.

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 iFlow Directors. 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.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.

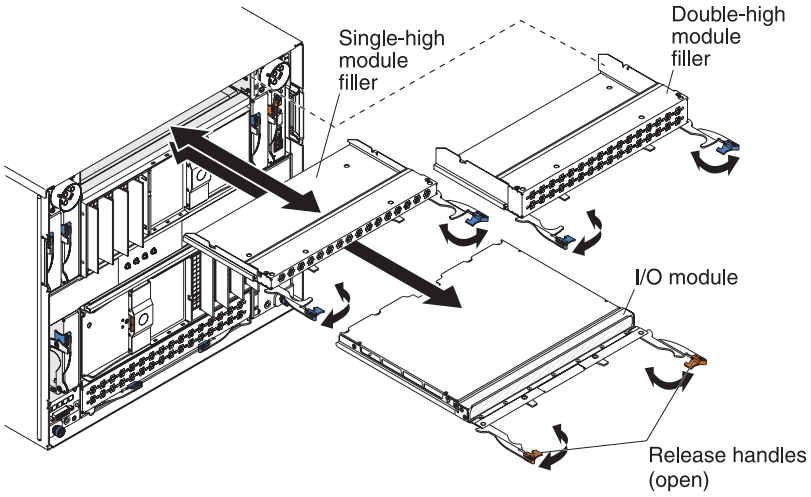
To reduce the possibility of electrostatic discharge, observe the following precautions:

- 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. 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.

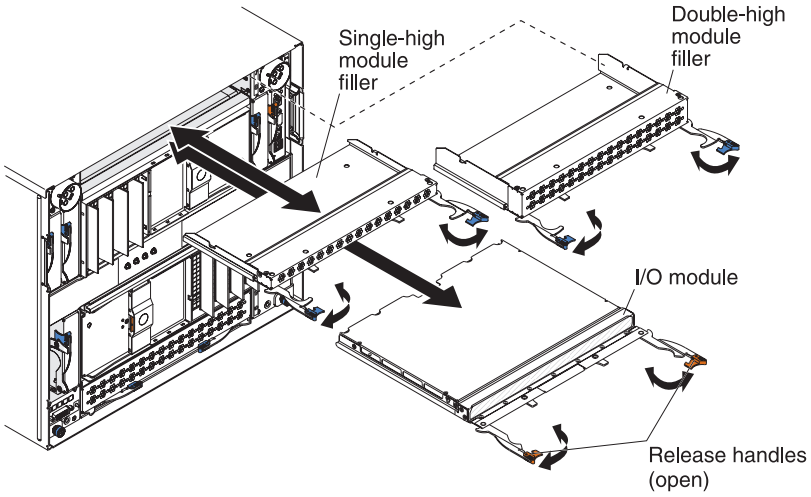
b. To maintain proper airflow, make sure that the ventilation holes on the front of the switch module are not blocked.

10. Make sure that the LEDs on the switch module indicate that it is operating correctly (see "Information LEDs" on page 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 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.

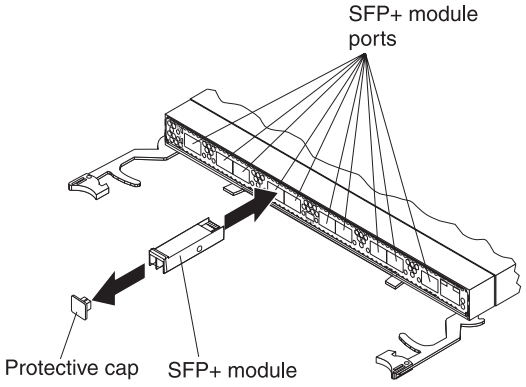
Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

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.



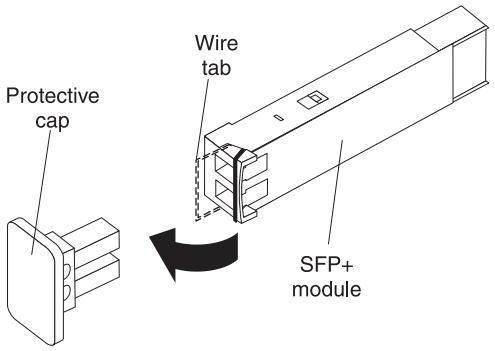
8. Connect the fiber optic cable (see "Connecting the SFP+ module cable" on page 20) and any cables that you disconnected earlier.

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.

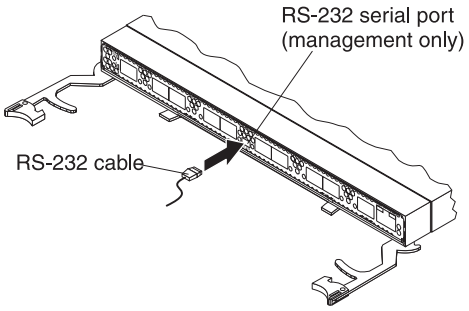
Chapter 4. Cabling the switch module and the SFP+ module

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.

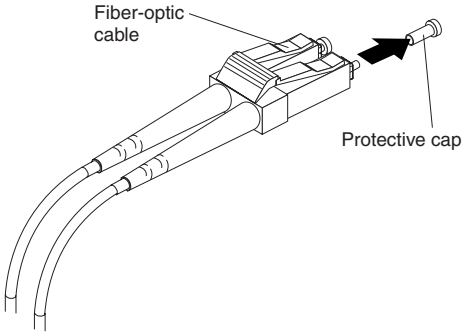
Connecting the SFP+ module cable

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

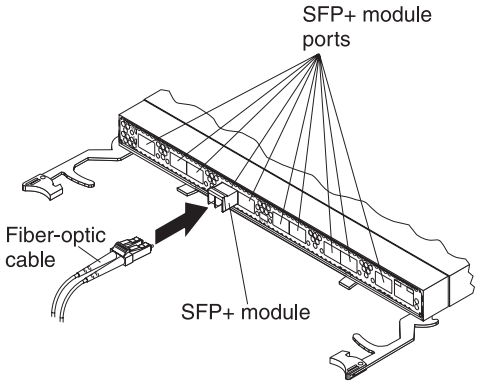
- Do not route the cable along a folding cable-management arm.
- When you attach the cable to a device on slide rails, leave enough slack in the cable so that it does not bend to a radius of less than 38 mm (1.5 in.) when the device is extended or become pinched when the device is retracted.
- Route 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 5, “Information panels, LEDs, and external ports,” on page 23.

Disconnecting the SFP+ module cable

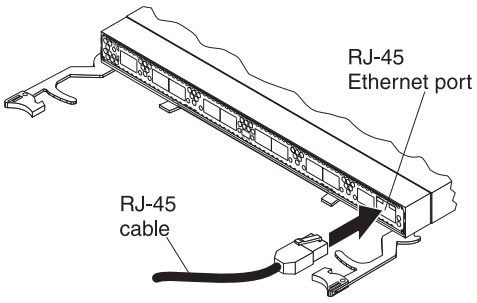
To disconnect the SFP+ module cable, complete the following steps:

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 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.

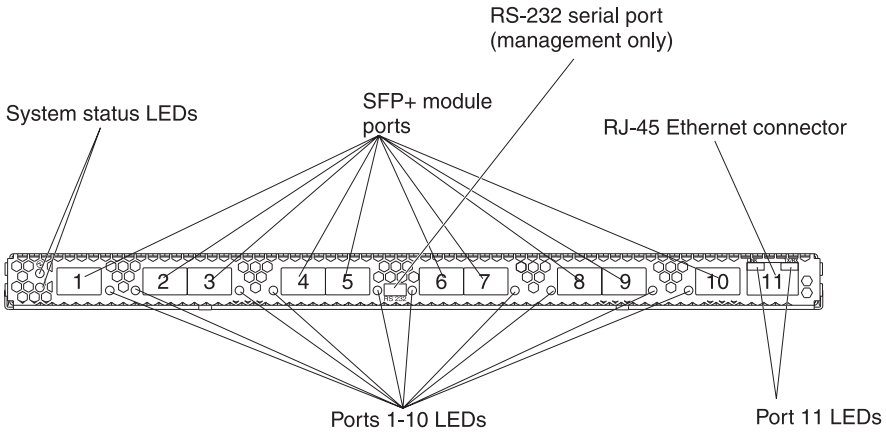
Chapter 5. Information panels, LEDs, and external ports

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:

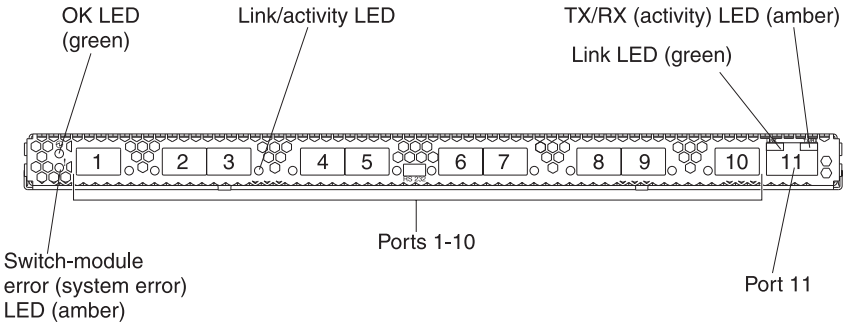
- LEDs that display the following information:
  - The status of the switch module and its network connection
  - The status of the external connections to the switch module

  For further details about LEDs, see "Information LEDs" on page 24.
- 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 25 and "Port status LEDs" on page 25.



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 *BNT Command Reference* 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 6. Configuring the switch module

The switch module has an internal Ethernet path to the management module, eleven external Ethernet ports, 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 eleven 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 ten external SFP+ ports and the external RJ-45 Ethernet port 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 RS-232 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*
- The default IP address of the switch module is 192.168.70.133, 192.168.70.134, 192.168.70.135, or 192.168.70.136, depending on the switch-module bay where it is installed.
- If you change the IP address of the switch module and restart the BladeCenter unit, the switch module maintains 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.

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.

The Web interface provides 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.

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	The switch can be managed through the management module or a blade server. No traffic is allowed on external ports.
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 through 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 x` and press **Enter**.
   where *x* is the IP address for the switch module.
2. If you do not have an assigned initial password, in the **Password** field, type the default password (`admin`) and press **Enter**.

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.

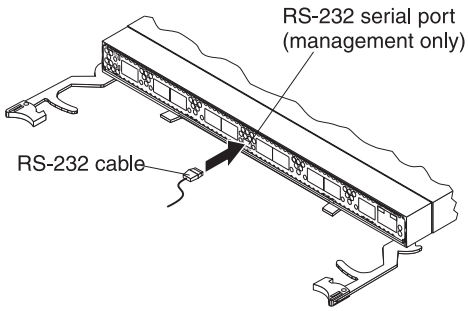
For more information about configuring through the CLI, see the *BNT 10-Port 10Gb Ethernet Switch Module for IBM BladeCenter Command Reference*.

Configuring the switch module through the serial-port interface

The serial port provides basic communication RS-232 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 serial cable that comes with your device into the RS-232 port and connect the other end to the management station.



   For additional information, see "Connecting the serial 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 `admin`. The default password is `admin`.

The serial port is compatible with the standard 16550 Universal Asynchronous Receiver/Transmitter (UART) protocol. The RS-232 serial port is enabled by default.

Configuring the switch module through the switch-module browser-based interface

This section describes how to use the switch-module browser-based interface (BBI) to access and configure the internal switching software. For more information about the BBI, see the *BNT 10-Port 10Gb Ethernet Switch Module for IBM BladeCenter Browser Based Interface Quick Guide*.

This section also describes some of the Web interface switch-module management features.

The switch module offers an embedded HTML, browser-based interface that you can use to manage the switch through Netscape Navigator and Communicator, Mozilla Firefox, or Microsoft Internet Explorer. This interface is enabled by default. The browser-based interface acts as an access tool and can communicate directly with the switch through HTTP. Your computer might have to access and install a Java plug-in (JRE 1.4.0) to run without errors. Later versions of the JRE might work but are not officially supported.

Note: This interface does not accept Chinese-language input (or other double-byte character-set languages).

Before you can access and start the browser-based interface, make sure that you have completed the following procedures:

- Install the switch module in the BladeCenter unit.
- Make sure that the switch-module software is installed on the switch module.
- Configure at least one IP interface on the switch module.
- Enable frames and the JavaScript program in your Web browser.

The following hardware and software are required for the Web interface:

- A frame-capable Web-browser program, such as Internet Explorer (version 6.0 or later), Mozilla Firefox (version 1.0.4 or later), or Netscape Navigator (version 4.7 or later)
- A computer or workstation with network access to the switch module

To start the browser-based interface, complete the following steps:

1. Start a Web browser. The Web-browser window opens.
2. In the **URL** field, enter the IP address of the switch module, in the following format:

   http://*xxx.xxx.xxx.xxx*. The login window opens.
3. Enter your user ID and password and click **OK**. The default user ID is `admin`. The default password is `admin`.

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. For more information about configuring and managing the switch module through the management module, see the *BNT Command Reference* for the switch module.

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 `admin`.
2. Type your password (default is `admin`) and press **Enter**. The default password is `admin`. The main-menu window opens.

After you log on to the switch module, you must set the date and time. See the *Command Reference* for the switch module to perform this task and others as needed.

Chapter 7. Updating the software

This chapter describes how to register IBM iFlow Director, upgrade the switch software, and activate the iFlow Director license key.

Registering IBM iFlow Director

Product registration is required for you to activate the product warranty, receive technical support and download new software. To register, use the activation code printed on the CD envelope that is included in your license kit.

Note: Save the activation code for future use.

To register iFlow Director, complete the following steps:

1. Log in to the switch, using the menu-based command line interface (ibmnos) and enter the following command:

   ```
   /info/sys/gen
   ```

2. Locate the iFlow Director serial number in the System Information output.

   Note: Save a copy of the serial number for future use.

3. Go to the https://ses.bladenetwork.net/ site. The Software Entitlement System (SES) login page is displayed.
4. If you are a new customer, click **Register** and follow the on-screen instructions to create a new account.
5. Log in with the user name and password that you used for registration, and click **Login**. The SES home page is displayed.
6. Select the **Register Products** tab. The registration form page is displayed.
7. Register your IBM iFlow Director switch using the form on the left panel. In the appropriate fields, type the location (any physical geographic location), switch serial number, and switch model (for example, IBM OEM Part Numbers 46C9250 for iFlow Director), and click **Add New**.
8. Register your Activation Code. On the right side of the Register Products form, enter the Authentication code or Activation code and click **Add**.

   Note: Locate the activation code on the back of the CD envelope that is included in your license kit. Keep the activation code for future reference.

9. Select the **SES Home** tab, and then select the newly added switch. Click **Activate IBM iFlow Director** to generate your license key code. An email will be sent to your registered email address. You can also view the license key on the SES Home page. You can use the license key to activate IBM iFlow Director software (see “Enabling Licensing Key Codes” on page 38).

Note: The SES Home page allows you to download the latest iFlow Director software and manuals, (click the + sign on the top left corner of the page).

Determining the version of iFlow Director software

After you install the switch module in the BladeCenter chassis, make sure that the latest version software is installed on the switch module. To determine the level of the software 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 left panel, click **I/O Module Tasks** and select the **Configuration** menu. Then in the right panel, select the switch module slot tab, and make a note of the IP address used for the switch module.
3. Use a host to connect through the management module to Telnet the above IP Address used for the switch module.
4. Log in to the switch module using the menu-based command line interface (ibmnos) and enter **/boot/cur**. The current boot information is displayed (see output below). Note the version of software used for image 1, image 2, the boot kernel, and the current image set to boot.

```
>>Main# /boot/cur
Currently set to boot software image1, active config block.
Current CLI mode set to IBMN/OS-CLI with selectable prompt enabled.
Current FLASH software:
  image1: version 13.7.3, downloaded 20:42:41 Sat Jan 14, 2012
          NormalConnect
  image2: version 13.7.2, downloaded 15:08:48 Fri Jan 21, 2012
          NormalConnect
  boot kernel: version 13.7.3
Currently scheduled reboot time: none
```

Obtaining the latest level of switch software

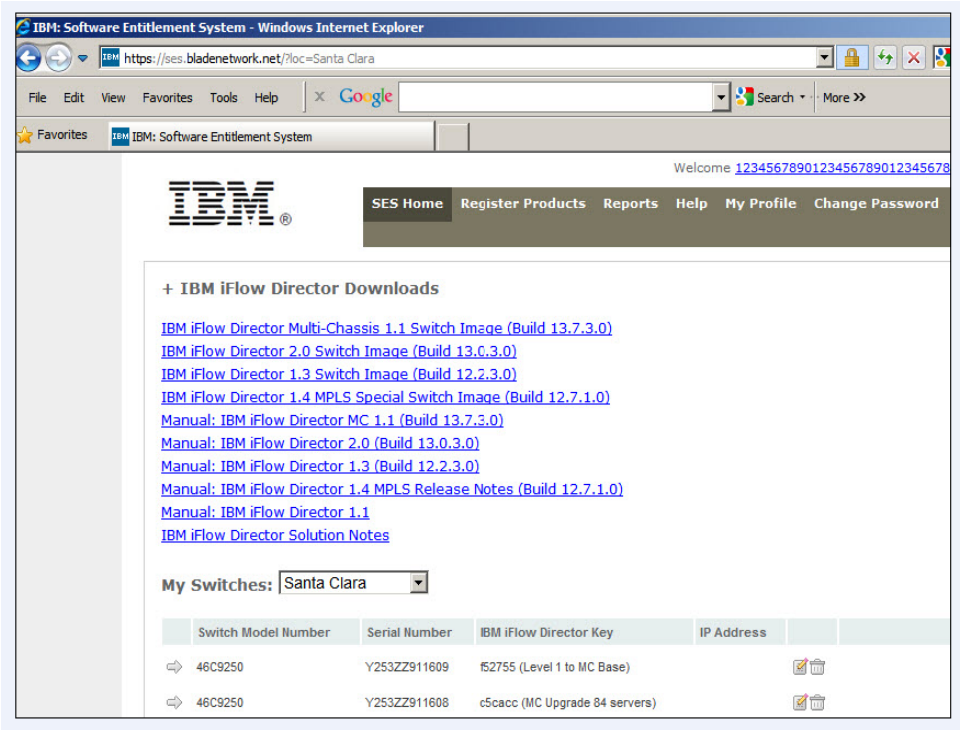
The switch module might have features that are not described in the documentation that comes with the switch, and the documentation might be updated occasionally to include information about those features or technical updates.

The latest firmware and documentation are available for download only after the iFlow Director switch module and Activation code are registered and the license key code is generated on the https://ses.bladenetwork.net/ web site. 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 the https://ses.bladenetwork.net/ site. The SES Home is displayed.
2. Click **+ IBM iFlow Director Downloads** and select the firmware and documentation to download.

Figure 1. SES Home page downloads



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

Upgrading the switch-module software

You can upgrade the switch-module software by using a TFTP server application. Typically, this TFTP server runs as an application under your operating system. Make sure that this software is installed; then, download the software images from https://ses.bladenetwork.net into a directory on your TFTP server. Enable the TFTP server and set the default directory to the one where the image is stored.

To transfer the software image files from the TFTP server to the switch, you can establish a Telnet session through the management module. Ping the TFTP server to make sure that you have a connection. The Telnet session performs optimally if all three network entities (TFTP server, management module, and switch IP addresses) are on the same subnet. Otherwise, you must use a router and configure a gateway address on the switch. Use the management-module interface to configure the IP addresses of the management module external interface (eth0) and the switch module so that they are both on the same subnet as the TFTP server.

Examples of IP addresses and masks are described in the following table.

Network entity	IP address	Mask
TFTP server	192.168.2.178	255.255.255.0
Management module (eth0)	192.168.2.237	255.255.255.0
Switch-module current IP configuration	192.168.2.51	255.255.255.0

Note: With this configuration, you can ping the switch module from the TFTP server.

To upgrade the switch-module software, complete the following steps:

1. Use a host to connect through the management module to telnet the above IP address of the switch module, as described in "Determining the version of iFlow Director software" on page 36.
2. Log in to the switch, using the menu-based command line interface (ibmnos), and enter the following command to upgrade the Boot image:

   /boot/gt boot *<TFTP server IP address> <boot image file name>*

   For example:

   /boot/gt boot 192.168.2.178 GbESM-24-10G-13.7.3.0_Boot.img
3. Enter the following command to upgrade the software image (either image1 or image2):

   /boot/gt {1|2} *<TFTP server IP address> <software image file name>*

   For example (software image1):

   /boot/gt 1 192.168.2.178 GbESM-24-10G-13.7.3.0_OS.img
4. Enter the following command to restart the switch module with the new software:

   /boot/reset

Enabling Licensing Key Codes

The iFlow Director comes preloaded with the iFlow Director software. iFlow Director behaves as an Ethernet switch module until you install and enable the license key code. Upon successful registration of the iFlow Director, you are entitled to download iFlow Director machine code updates during the warranty period, starting from the date that the license key is generated.

Note: Each license key code supports a specific iFlow Director type based on the switch serial number. Key codes are non-transferable.

The follow table describes the different types of licenses available for iFlow Director. Purchase and install the activation code that fits your network requirements.

Table 3. iFlow Director License Types

Product	Description
IBM iFlow Director—Level-1	Enables functionality on four external ports of iFlow Director.
IBM iFlow Director—Level-2	Enables functionality on all ten external ports of iFlow Director.

Table 3. iFlow Director License Types (continued)

Product	Description
IBM iFlow Director—Level-1 to Level-2	Upgrades from iFlow Director Level-1 to iFlow Director Level-2.
IBM iFlow Director—MC-Base	Enables iFlow Director functionality on up to 28 servers in two BladeCenter chassis.
IBM iFlow Director—MC-14 server add-on	Enables an additional fourteen servers. Fourteen server Add-On licenses are cumulative. Purchasing and installing additional licenses supports up to 84 servers on six BladeCenter chassis.
IBM iFlow Director—Level-1 to iFlow Director MC-Base upgrade	Upgrades from iFlow Director Level-1 to MC-Base.
IBM iFlow Director—Level-2 to iFlow Director MC-Base upgrade	Upgrade from iFlow Director Level-2 to iFlow Director MC-Base.

To enable the iFlow Director license key code, complete the following steps:

1. Log in to the switch using the menu-based CLI and at the **Main#** prompt enter the following command:

   /o/sw/key/enakey

2. At the **Enter the Software Feature** prompt, enter **ibmiflow**.
3. At the **Enter a License Key** prompt, enter the license key code. This license key code is stored on the SES Home page.
4. Enter the following command to confirm your license key code is correctly enabled:

   /info/sw

5. To restart the switch, enter **/boot/reset**. The switch reboots and the software updates are complete.

Chapter 8. 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)
Assembly	46C9250
Serial console cable	43X0510
IBM 10 Gb SFP+ small-form-factor pluggable module, SR (850 nm)	44W4411
I/O module filler, single high	31R3303

Chapter 9. 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 45.

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.

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 45.

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

On the World Wide Web, up-to-date information about IBM systems, optional devices, services, and support is available 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

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

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- **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

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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).

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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).

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台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
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

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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.

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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 4. 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.

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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.

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

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

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高調波ガイドライン適合品

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Index

G

H

I

L

M

N

O

P

R

S

T

U

W

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