

Cisco Systems 4 Gb Fibre Channel Switch Module for
IBM BladeCenter



Installation Guide

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IBM BladeCenter



Installation Guide

Note: Before using this information and the product it supports, read Appendix B, "Warranty," on page 31 and the general information in Appendix C, "Notices," on page 51.

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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 ασφαλείας (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 pečítajte 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.

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:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

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

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 Cisco Systems 4 Gb Fibre Channel switch module

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

- Setting up and installing or replacing the Cisco Systems 4 Gb 10 Port Fibre Channel Switch Module for IBM® BladeCenter® or Cisco Systems 4 Gb 20 Port Fibre Channel Switch Module for IBM BladeCenter
- Using the information panel, LEDs, and external ports on the switch module
- Configuring the switch module through the Telnet program
- Configuring the switch module through a Web browser interface
- Solving problems with the switch module

For installation details, see Chapter 2, “Installing and replacing a switch module,” on page 7. For additional information about switch modules and other BladeCenter components, see the BladeCenter documentation that comes with these devices.

To support each switch module that you install in the BladeCenter unit, you must also install a compatible Fibre Channel expansion 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 Fibre Channel 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 expansion card.

You can obtain up-to-date information about the Cisco Systems 4 Gb 10 Port Fibre Channel Switch Module for IBM BladeCenter or Cisco Systems 4 Gb 20 Port Fibre Channel Switch Module for IBM BladeCenter and other IBM products at <http://www.ibm.com/systems/support/>.

Notes:

1. Throughout this document, the Cisco Systems 4 Gb 10 Port Fibre Channel Switch Module for IBM BladeCenter or Cisco Systems 4 Gb 20 Port Fibre Channel Switch Module for IBM BladeCenter is referred to as the switch module or the I/O module.
2. Unless otherwise stated, references to the BladeCenter unit apply to all BladeCenter units that support the switch module. Examples of applicable BladeCenter units are the BladeCenter H unit and the BladeCenter Type 8677.
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.
7. When you are using the switch module with a BladeCenter T unit, the internal ports operate at 2 Gbps, and the external ports operate at up to 4 Gbps.

The switch module is a Fibre Channel component that contains 10 or 20 ports:

- The 10-port switch module has:
 - Seven internal ports to connect to the blade-server bays in the BladeCenter unit
 - Three external Fibre Channel user ports to connect to external Fibre Channel devices
- The 20-port switch module has:
 - 14 internal ports to connect to the blade-server bays in the BladeCenter unit
 - Six external Fibre Channel user ports to connect to external Fibre Channel devices

For additional information about the ports, see Chapter 3, “Information panel LEDs and external Fibre Channel ports,” on page 13.

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

- A Telnet connection to the embedded command-line interface (CLI)
For more information, see Chapter 4, “Configuring the switch module through the Telnet interface,” on page 17.
- A Web browser interface
For more information, see Chapter 5, “Configuring the switch module through the Web interface,” on page 21.

Record information about the switch module in the following table. You can find this information on the labels on the switch module. For an illustration that shows the locations of these labels, see “Major components of the switch module” on page 5. You will need this information when you register the switch module with IBM. You can register the switch module at <http://www.ibm.com/support/mysupport/>.

Product name	<input type="checkbox"/> Cisco Systems 4 Gb 10 Port Fibre Channel Switch Module for IBM BladeCenter or <input type="checkbox"/> Cisco Systems 4 Gb 20 Port Fibre Channel Switch Module for IBM BladeCenter
Model number	_____
Serial number	_____
Worldwide name (WWN)	_____
Media access control (MAC) address 1	_____
Other MAC addresses	_____ _____ _____

Specifications

For detailed information about the switch-module hardware and software features, specifications, and standards, see the Cisco documentation that comes with your hardware.

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 BladeCenter unit.

The following related IBM 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 Management Module Command-Line Interface Reference Guide*
- *IBM BladeCenter Advanced Management Module User's Guide*
- *Management Module User's Guide* for the BladeCenter unit
- *Installation and User's Guide* for the BladeCenter unit
- *Safety Information*

In addition, you might have to review the *IBM Configuration and Options Guide*, which contains information about which small form-factor pluggable (SFP) module and cable are required to connect the switch module to other network or storage devices. This document is available in both HTML and PDF from <http://www.ibm.com/servers/eserver/xseries/cog/>.

The following related Cisco documentation is available from the main Cisco Web site, <http://www.cisco.com/>. Additional related documentation also is available from this Web site.

- *Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Releases*
- *Cisco MDS 9000 SAN-OS Hardware and Software Compatibility Information*
- *Cisco MDS 9000 Family Fabric Manager Configuration Guide*
- *Cisco MDS 9000 Family CLI Configuration Guide*
- *Cisco MDS 9000 Family Command Reference*
- *Cisco MDS 9000 Family Troubleshooting Guide*
- *Cisco MDS 9000 Family System Messages Reference*

For more information about documentation requirements, see "Using the documentation" on page 29.

Inventory checklist

Make sure that the shipping carton contains the following items:

- One Fibre Channel switch module: Cisco Systems 4 Gb Fibre Channel Switch Module for IBM BladeCenter
- *Cisco Systems 4 Gb Fibre Channel Switch Module for IBM BladeCenter Installation Guide* (this document)
- One diagnostic wrap plug
- Safety flyer

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.

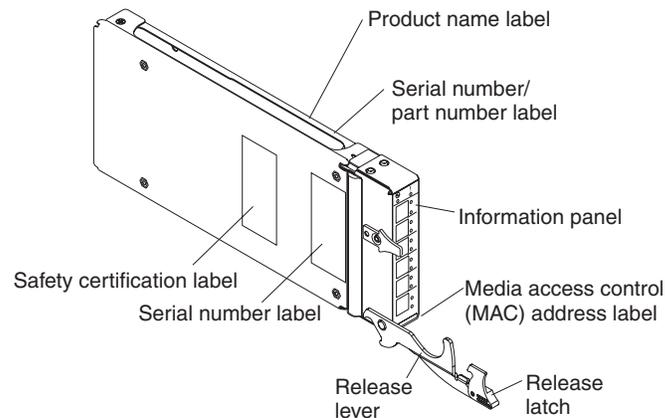
The following notices and statements are used in this document:

- **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 following illustration.

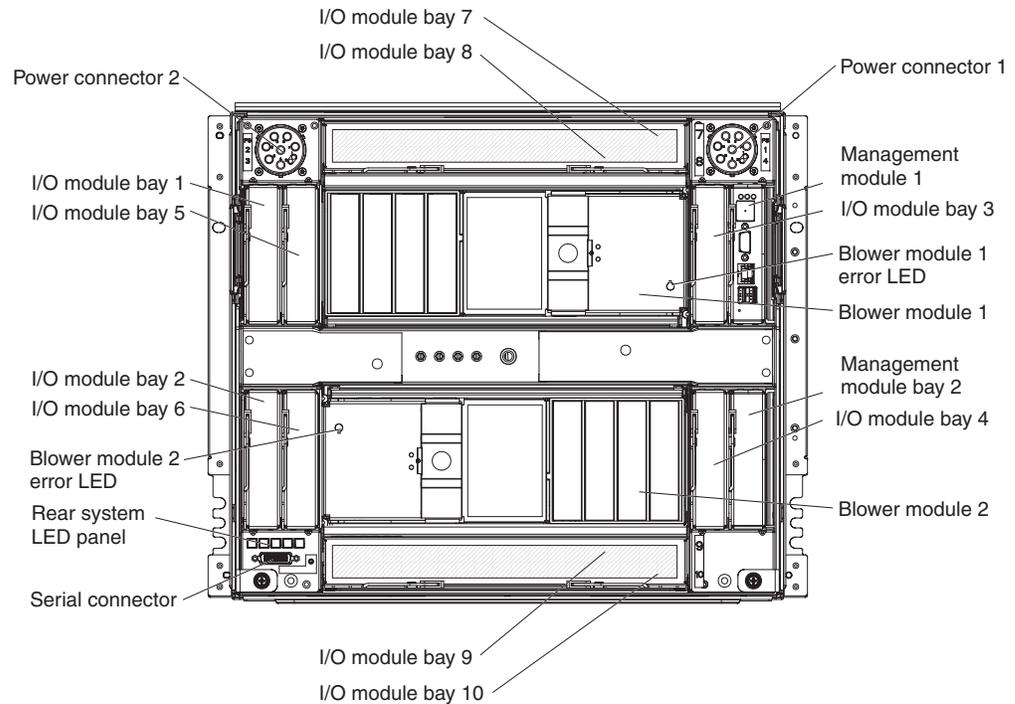


For more information about the components of the information panel, see Chapter 3, “Information panel LEDs and external Fibre Channel ports,” on page 13. For more information about the MAC address, see the *Cisco MDS 9000 Family CLI Configuration Guide*.

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.

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.



As of the date of this document, Fibre Channel switch modules can be installed only in I/O-module bays 3 and 4 of the BladeCenter unit. The other I/O-module bays do not support the switch module.

A Fibre Channel expansion card or host channel adapter (HCA) must be installed in each blade server that you want to communicate with. The expansion card has two 2 or 4 Gbps Fibre Channel ports. To enable the switch module to communicate with a blade server, at least one switch module must be installed in the BladeCenter unit. Depending on the type of BladeCenter unit that you are using, the BladeCenter unit supports a maximum of 10 or 14 expansion cards. For details about expansion-card installation, configuration, and use, see the documentation that comes with the expansion card.

Important: The switch modules and all blade server expansion cards in the BladeCenter unit must use the same interface type. Therefore, you must install Fibre Channel expansion cards when you install Fibre Channel switch modules into the BladeCenter unit.

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

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 3 of the BladeCenter unit.
- When the switch module is installed in a BladeCenter T unit, the internal ports operate at 2 Gbps, and the external ports operate at speeds up to 4 Gbps.
- Configuration requirements for the switch module and the BladeCenter unit might vary. You can obtain up-to-date information about the switch module and the BladeCenter unit at <http://www.ibm.com/systems/bladecenter/>.

The following table summarizes the application for each switch module.

Table 1. Switch-module bay/expansion-card port correlation

I/O-module bay in BladeCenter unit	Fibre Channel switch-module function
3	Port 0 connection on the Fibre Channel expansion card in the BladeCenter unit
4	Port 1 connection on the Fibre Channel expansion card in the BladeCenter unit

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 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

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. 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 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. Remove the acoustic attenuation module option, if one is installed, from the rear of the BladeCenter unit. For more information, see the documentation that came with the BladeCenter unit.
4. Select only I/O-module bay 3 or bay 4 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.

5. Remove the filler module from the selected bay. Store the filler module for future use.
6. Remove the switch module from its static-protective package.
7. Make sure that the release latch on the switch module is in the open position (perpendicular to the module). For the location of the release latch, see “Major components of the switch module” on page 5.

Depending on the type of BladeCenter unit that you are using, the installation procedure requires either a vertical or horizontal orientation for the switch module. For information about installing a switch module in your type of 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 latch 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 for approximately 5 seconds; then, all the LEDs except the OK LED turn off. The power LED flashes to indicate a normal POST condition; then, POST proceeds as described in the next step.
 - b. To maintain proper airflow, make sure that the ventilation areas on the sides of the blade server are not blocked.
10. Make sure that the LEDs on the switch module indicate that it is operating correctly (see “Information LEDs” on page 14).
 - When the POST starts, make sure that the green power LED on the switch module is flashing. The POST tests the condition of firmware, memory, data paths, and switch logic and uses the fault LED to indicate pass or fail conditions.
 - Make sure that the green power LED on the switch module stops flashing to indicate that the switch logic has completed POST.
 11. If you have a second switch module to install, repeat step 5 through step 10; otherwise, go to step 12 on page 11.

12. If you are using the external switch-module ports, you can connect an SFP module option to external Fibre Channel port 0 and Fibre Channel ports 15 through 19. For SFP module installation instructions, see the documentation that comes with the SFP module.

Note: SFP module options do not come with the switch module but are required if you want to use external switch-module ports.

13. Use LC-LC or LC-SC fiber-optic cables to connect the switch-module external ports to external Fibre Channel devices. For more information, see the documentation that comes with the cable options.

Note: You can remove and replace an SFP module while the switch module is operating without damaging the switch module or the SFP module. However, transmission on the affected port will be interrupted until the SFP module and cables are installed. See the documentation that comes with the connected Fibre Channel device for information about installation, configuration, and startup sequence.

14. Replace the acoustic attenuation module, if you removed it in step 3 on page 10.
15. Make sure that the external ports on the switch module are enabled (click **I/O Module Tasks** → **Management** → **Advanced Management** → **Advanced Setup** in the management-module Web-based interface).

Removing or replacing a switch module

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. If the BladeCenter unit has an acoustic attenuation module installed, remove it. See the documentation for the BladeCenter unit for instructions.
3. Disconnect the LC-LC or LC-SC cables from the two external ports on the SFP module. Removing these cables disrupts the network connection from the external Fibre Channel port to any connected external Fibre Channel devices. For removal instructions, see the documentation that comes with the cable options.
4. Remove any SFP modules from the switch-module external Fibre Channel ports. For SFP-module removal instructions, see the documentation that comes with the SFP module.
5. Pull the release latch toward the bottom of the switch module. The module moves out of the bay approximately 0.6 cm (0.25 inch).
6. Slide the switch module out of the bay and set it aside.
7. Place either another switch module or a filler module in the bay.

Important: Complete this step within 1 minute (see steps 9 and 10 on page 10 for more information).

8. If you placed another switch module into the bay and if you are using the external switch-module ports, insert any SFP modules that you removed in step 4 into external Fibre Channel port 0 and Fibre Channel ports 15 through 19. For SFP-module installation instructions, see the documentation that comes with the SFP module.

9. Use LC-LC or LC-SC fiber-optic cables to connect the switch-module external ports to external Fibre Channel devices. For more information, see the documentation that comes with the cable options.
10. Replace the acoustic attenuation module, if you removed it in step 2 on page 11.

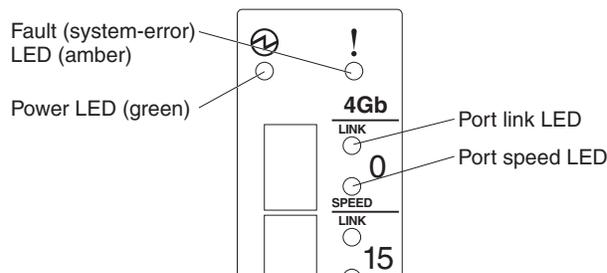
In the I/O-module configuration menus:

- The internal connectors on the 20-port switch module are numbered 1 through 14.
- The internal connectors on the 10-port switch module are numbered 1 through 7.

Note: The IBM BladeCenter T Types 8720 and 8730 units have eight internal ports.

Information LEDs

The front panel of the Fibre Channel switch module has multiple sets of LEDs. The LEDs in the first row at the top of the switch module indicate the switch module status. The port link and port speed LEDs indicate the status of the external Fibre Channel ports.



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 for approximately 5 seconds during POST, and then all the LEDs except the power LED turn off. The power LED flashes to indicate a normal POST condition; then, POST proceeds as described in step 10 on page 10.

After you install the switch module in the BladeCenter unit, the switch-module LEDs become active. There are four possible LED states: off, lit, flickering, and flashing. The lit (steady) LEDs and flashing LEDs can be green or amber. A flickering LED can only be green.

The LEDs might display any of these states and colors during startup, POST, or other diagnostic tests. This is typical and does not indicate a problem, unless the LEDs indicate a problem after all the startup (boot) processes and diagnostic tests have been completed.

Any errors that are detected during POST are written to the system log. This log is accessible through the **show logging logfile** command. For information about this command, see the *Cisco MDS 9000 Family Command Reference*. For information about error messages, see the *Cisco MDS 9000 Family System Messages Reference*.

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 two LEDs in the first row at the top of the switch module represent the switch-module status. The green LED to the left is the Power LED; it indicates that the switch module is on, off or receiving power. The amber LED to right is the fault LED; it indicates that an error status has occurred on the switch module.

Power 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 and the power modules in the BladeCenter unit are working correctly.
- When this LED is green and flashing, it indicates that the switch module is running the POST.
- When this LED is not lit and the amber fault LED is lit, it indicates a critical alert. If the amber LED is also not lit, it indicates that the switch module is not receiving power. To identify the error, check the management-module error log.

Fault LED

This amber LED is at the top right 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 is working correctly. If the green LED is also not lit, it indicates that the switch module is not receiving power. To identify the error, check the management-module error log.

Fibre Channel port status LEDs

Two port LEDs are directly to the right of each Fibre Channel external port on the front panel of the switch module. These LEDs indicate the link status and speed of each Fibre Channel external port.

Port link LED

This green LED is the top LED.

- When this LED is lit, the corresponding port is online.
- When this LED is flickering, the corresponding port is connected and Fibre Channel activity is occurring on that port.
- When this LED is flashing slowly, the corresponding port is online but segmented from the connected switch or device.
- When this LED is flashing rapidly, the corresponding port is in the internal loopback mode because of diagnostics.
- When this LED is not lit, it indicates that there is no signal or no activity on the corresponding port.

Port speed LED

This green LED is the bottom LED.

- When this LED is lit, the corresponding port is operating at 4 Gbps.
- When this LED is not lit, the corresponding port is operating at 1 Gbps or 2 Gbps.

Chapter 4. Configuring the switch module through the Telnet interface

The switch module contains a Telnet server. This server enables a Telnet client to establish a Telnet session with the Fibre Channel switch module to retrieve information or to configure parameters through the command-line interface (CLI). You can perform a variety of fabric and switch-management tasks through an Ethernet connection by using the CLI.

You can access the Telnet interface in two ways:

- In the BladeCenter unit management-module Web interface
- In a command-line window on a network-management workstation

To access a switch module from a network-management workstation, make sure that it is connected to an external BladeCenter unit management-module Ethernet port.

To enable the configuration settings in the management-module Web interface, click **I/O Module Tasks** → **Admin/Power/Restart**.

Important: Before you configure the switch module, make sure that the management modules in the BladeCenter unit are correctly configured. The management module and the switch module must be on the same Internet protocol (IP) subnet.

Notes:

1. 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.
2. Throughout this document, the management-module Web-based user interface is also known as the BladeCenter management-module Web interface.
3. Throughout this document, the user name is also known as the login name or user ID for logging on to interfaces or programs.
4. 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.
5. The switch module does not support external (remote) access or management with respect to any ports.

Connecting to the switch module

To use the Telnet program (in VT100 compatible terminal mode) to access and control the switch module, you must know the IP address of the switch module and have an existing network connection. 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 commands.

Establishing a Telnet session through the management module

To establish a Telnet session through the BladeCenter unit management module, complete the following steps.

1. In your browser, in the address bar, type:

`http://xxx.xxx.xxx.xxx`

where `xxx.xxx.xxx.xxx` is the IP address of the BladeCenter unit management-module interface.

Note: The default IP address for the BladeCenter unit management module is 192.168.70.125.

2. Click **GO** or press Enter.

The Enter Network Password window opens.

3. In the **User Name** field, type the initial default user name, USERID. In the **Password** field, type the initial default password, PASSWORD (the sixth character is a zero, not the letter O). The **User Name** and **Password** fields are case sensitive.

The management-module Welcome window opens.

4. In the **Inactive session timeout value** field, select the timeout value for this Web session and click **Continue**.

The management-module main window opens.

5. In the left navigation pane, under **I/O Module Tasks**, click **Management**.

The I/O Module Management window opens.

6. Click the link for either 3 or 4.

The BladeCenter Management window opens.

7. Make sure that the IP address is the same in the **Current IP Configuration** and **New Static IP Configuration** areas.

8. Click **Advanced Management**.

The BladeCenter Switch Management window opens.

9. To start a Telnet session, scroll down to the **Start Telnet/Web Session** area and click **Start Telnet Session**.

The management-module command-prompt window opens.

10. At the Login prompt, type the initial default user name, USERID, and press Enter. At the Password prompt, type the initial default password, PASSWORD (the sixth character is a zero, not the letter O), and press Enter. The **User Name** and **Password** fields are case sensitive.

11. If you are accessing the switch module for the first time, press Enter to log on and set the switch password. When you log on, use the admin user name. There is no password prompt or default password. You must create and set a password by using the correct commands.

To open online help to view the available commands, type `help` and press Enter.

For more information about password requirements and using the CLI, see the *Cisco MDS 9000 Family Command Reference* and the *Cisco MDS 9000 Family CLI Configuration Guide*.

Establishing a Telnet session in a command-line window

You can access the switch module through IP-enabled devices that are connected to the BladeCenter unit management module. An Ethernet connection to the management-module external ports on the BladeCenter unit is required. For more information, see the following documents:

- *Installation and User's Guide* for the BladeCenter unit
- *BladeCenter Management Module User's Guide*
- *BladeCenter Management Module Installation Guide* for the BladeCenter unit

To establish a Telnet session through a command-line window, complete the following steps.

Note: In these commands, the default IP address of the switch module is 10.90.90.9x, where x is the I/O-module bay number.

1. Open a command-line window on the network-management workstation.
2. Type one of the following commands.

For the switch module in I/O-module bay 3:

```
telnet 10.90.90.93
```

For the switch module in I/O-module bay 4:

```
telnet 10.90.90.94
```

3. Press Enter.
A Telnet command-prompt window opens.
4. At the Login prompt, type the initial default user name, USERID, and press Enter. At the Password prompt, type the initial default password, PASSWORD (the sixth character is a zero, not the letter O). The **User Name** and **Password** fields are case sensitive.
5. If you are accessing the switch module for the first time, type the following configuration commands to change the switch password, as shown in the following example. Type each command on a separate line.
 - a. switch# conf t
 - b. switch(config)# username USERID password x, where x is the password that you have chosen
 - c. exit

After you have changed the password, the command prompt is displayed in the Telnet window.

Note: For more information about password requirements and using the CLI, see the *Cisco MDS 9000 Family Command Reference* and the *Cisco MDS 9000 Family CLI Configuration Guide*.

Chapter 5. Configuring the switch module through the Web interface

The switch module contains a Web server interface. This server enables a Web-based client to establish a Web-interface session with the Fibre Channel switch module to retrieve information or to configure parameters through a Web browser. You can perform a variety of fabric and switch-management tasks through an Ethernet connection by using a Web browser.

The Web interface is a graphical interface that requires a Web browser to view and manage the switch.

You can access the management-module Web interface in two ways:

- In the BladeCenter unit management-module Web interface
- Through a Web browser on a network-management workstation

For you to configure the switch module through the Web interface, the Internet protocol (IP) address and subnet masks must be compatible.

To access a switch module from a network-management workstation, make sure that it is connected to an external BladeCenter unit management-module Ethernet port.

To enable the configuration settings in the management-module Web interface, click **I/O Module Tasks** → **Admin/Power/Restart**.

Important: Before configuring the switch module, make sure that the management modules in the BladeCenter unit are correctly configured. See the *Installation and User's Guide* for the BladeCenter unit for more information.

Notes:

1. 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.
2. Throughout this document, the management-module Web-based user interface is also known as the BladeCenter management-module Web interface.
3. Throughout this document, the user name is also known as the login name or user ID for logging on to interfaces or programs.
4. 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.
5. The switch module does not support external (remote) access or management with respect to any ports.

Connecting to the switch module

To use the Web interface to access and control the switch module, you must know the IP address for the switch module and have an existing network connection. If you have to obtain the IP address for the switch module or establish a network connection, contact your system or network administrator.

Establishing a Web-interface session through the management module

To establish a Web-interface session through the BladeCenter unit management module, complete the following steps:

1. In your browser, in the address field, type:

`http://xxx.xxx.xxx.xxx`

where xxx.xxx.xxx.xxx is the IP address of the BladeCenter unit management-module interface.

Note: The default IP address for the BladeCenter unit management module is 192.168.70.125.

2. Click **GO** or press Enter.

The Enter Network Password window opens.

3. In the **User Name** field, type the initial default user name, USERID. In the **Password** field, type the initial default password, PASSWORD (the sixth character is a zero, not the letter O). The **User Name** and **Password** fields are case sensitive.

The management-module Welcome window opens.

4. In the **Inactive session timeout value** field, select the timeout value for this Web session and click **Start New Session**.

The management-module main window opens.

5. In the left navigation pane, under **I/O Module Tasks**, click **Management**.

The I/O Module Management window opens.

6. Click the link for either 3 or 4.

The BladeCenter Management window opens.

7. Make sure that the IP address is the same in the **Current IP Configuration** and **New Static IP Configuration** areas.

8. Click **Advanced Management**.

The BladeCenter Switch Management window opens.

9. To start a Web-interface session, scroll down to the **Start Telnet/Web Session** area and click **Start Web Session**.

The I/O-module Web interface window opens.

10. To perform switch-module administrative tasks, click **Admin**, and log in to the switch. In the **User Name** field, type the initial default user name, USERID. In the **Password** field, type the initial default password, PASSWORD (the sixth character is a zero, not the letter O). The **User Name** and **Password** fields are case sensitive.

For more information about using the Web interface, see the *Cisco MDS 9000 Family Fabric Manager Configuration Guide* on the Cisco main Web site (<http://www.cisco.com/>).

Establishing a Web-interface session through a Web browser

You can access the switch module through IP-enabled devices that are connected to the BladeCenter unit management module. An Ethernet connection to the management-module external ports on the BladeCenter unit is required. For more information, see the following documents:

- *Installation and User's Guide* for the BladeCenter unit
- *BladeCenter Management Module User's Guide*
- *BladeCenter Management Module Installation Guide* for the BladeCenter unit

To establish a Web-interface session through a Web browser, complete the following steps:

1. Open a Web browser on the network-management workstation.
2. Type one of the following Web addresses in the address field. These Web addresses contain default IP addresses.

Note: In these commands, the default IP address of the switch module is 10.90.90.x, where x is the I/O-module bay number.

For the switch module in I/O-module bay 3:

`http://10.90.90.93`

For the switch module in I/O-module bay 4:

`http://10.90.90.94`

3. Press Enter.

The I/O-module Web interface window opens.

4. To perform switch-module administrative tasks, click **Admin**, and log in to the switch. In the **User Name** field, type the initial default user name, USERID. In the **Password** field, type the initial default password, PASSWORD (the sixth character is a zero, not the letter O). The **User Name** and **Password** fields are case sensitive.

For more information about using the Web interface, see the *Cisco MDS 9000 Family Fabric Manager Configuration Guide* Release 3.x or later on the Cisco main Web site (<http://www.cisco.com/>).

Chapter 6. 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 Appendix B, “Warranty,” on page 31.

The replaceable components in the following table are FRUs only. 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	FRU number
Cisco Systems 4 Gb 10 Port Fibre Channel Switch Module for IBM BladeCenter	39Y9282
Cisco Systems 4 Gb 20 Port Fibre Channel Switch Module for IBM BladeCenter	39Y9278
Cisco Systems 4 Gb Short-wave Length SFP Module for IBM BladeCenter	41Y8602
Cisco Systems 4 Gb Long-wave Length SFP Module for IBM BladeCenter	41Y8603

Chapter 7. 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 *Cisco MDS 9000 Family Troubleshooting Guide* 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 29.

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 3, “Information panel LEDs and external Fibre Channel ports,” on page 13.

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 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 29.

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

Appendix A. Getting help and technical assistance

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

Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your system.

Note: For some IntelliStation models, the *Hardware Maintenance Manual and Troubleshooting Guide* is available only from the IBM support Web site.

- Go to the IBM support Web site at <http://www.ibm.com/systems/support/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

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

Using the documentation

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

Getting help and information from the World Wide Web

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

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

Software service and support

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

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

Hardware service and support

You can receive hardware service through IBM Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. See <http://www.ibm.com/planetwide/> for support telephone numbers, or 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. Warranty

IBM provides hardware warranty service for this product equivalent to that described in the IBM Statement of Limited Warranty ("SOLW"), a copy of which is included, notwithstanding the section entitled, "What this Warranty Does not Cover" of the SOLW. All references to "Machine" in the SOLW apply to this product (except for its firmware or accompanying software) for purposes of the warranty. References to "IBM's Official Published Specifications" mean the specifications for the product designated by IBM. Any firmware or software included in or which accompanies this product is subject to the terms and conditions of the manufacturer's end user license agreement.

IBM Statement of Limited Warranty Z125-4753-08 04/2004

Part 1 - General Terms

Part 1 - General Terms

*This Statement of Limited Warranty includes Part 1 - General Terms, Part 2 - Country-unique Terms, and Part 3 - Warranty Information. The terms of Part 2 replace or modify those of Part 1. The warranties provided by IBM in this Statement of Limited Warranty apply only to Machines you purchase for your use, and not for resale. The term "Machine" means an IBM machine, its features, conversions, upgrades, elements, or accessories, or any combination of them. The term "Machine" does not include any software programs, whether pre-loaded with the Machine, installed subsequently or otherwise. **Nothing in this Statement of Limited Warranty affects any statutory rights of consumers that cannot be waived or limited by contract.***

What this Warranty Covers

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications") which are available on request. The warranty period for the Machine starts on the original Date of Installation and is specified in Part 3 - Warranty Information. The date on your invoice or sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise. Many features, conversions, or upgrades involve the removal of parts and their return to IBM. A part that replaces a removed part will assume the warranty service status of the removed part. Unless IBM specifies otherwise, these warranties apply only in the country or region in which you purchased the Machine.

THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

What this Warranty Does not Cover

This warranty does not cover the following:

- any software programs, whether pre-loaded or shipped with the Machine, or installed subsequently;
- failure resulting from misuse (including but not limited to use of any Machine capacity or capability, other than that authorized by IBM in writing), accident, modification, unsuitable physical or operating environment, or improper maintenance by you;
- failure caused by a product for which IBM is not responsible; and
- any non-IBM products, including those that IBM may procure and provide with or integrate into an IBM Machine at your request.

The warranty is voided by removal or alteration of identification labels on the Machine or its parts.

IBM does not warrant uninterrupted or error-free operation of a Machine.

Any technical or other support provided for a Machine under warranty, such as assistance with “how-to” questions and those regarding Machine set-up and installation, is provided **WITHOUT WARRANTIES OF ANY KIND**.

How to Obtain Warranty Service

If the Machine does not function as warranted during the warranty period, contact IBM or your reseller to obtain warranty service. If you do not register the Machine with IBM, you may be required to present proof of purchase as evidence of your entitlement to warranty service.

What IBM Will Do to Correct Problems

When you contact IBM for service, you must follow the problem determination and resolution procedures that IBM specifies. An initial diagnosis of your problem can be made either by a technician over the telephone or electronically by access to an IBM website.

The type of warranty service applicable to your Machine is specified in Part 3 - Warranty Information.

You are responsible for downloading and installing designated Machine Code (microcode, basic input/output system code (called “BIOS”), utility programs, device drivers, and diagnostics delivered with an IBM Machine) and other software updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

If your problem can be resolved with a Customer Replaceable Unit (“CRU”) (e.g., keyboard, mouse, speaker, memory, hard disk drive), IBM will ship the CRU to you for you to install.

If the Machine does not function as warranted during the warranty period and your problem cannot be resolved over the telephone or electronically, through your application of Machine Code or software updates, or with a CRU, IBM or your reseller, if approved by IBM to provide warranty service, will either, at its discretion, 1) repair it to make it function as warranted, or 2) replace it with one that is at least functionally equivalent. If IBM is unable to do either, you may return the Machine to your place of purchase and your money will be refunded.

IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Exchange of a Machine or Part

When the warranty service involves the exchange of a Machine or part, the item IBM or your reseller replaces becomes its property and the replacement becomes yours. You represent that all removed items are genuine and unaltered. The replacement may not be new, but will be in good working order and at least functionally equivalent to the item replaced. The replacement assumes the warranty service status of the replaced item.

Your Additional Responsibilities

Before IBM or your reseller exchanges a Machine or part, you agree to remove all features, parts, options, alterations, and attachments not under warranty service.

You also agree to:

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided:
 - a. follow the service request procedures that IBM or your reseller provides;
 - b. backup or secure all programs, data, and funds contained in the Machine;
 - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit IBM to fulfill its obligations; and
 - d. inform IBM or your reseller of changes in the Machine's location.
4. (a) ensure all information about identified or identifiable individuals (Personal Data) is deleted from the Machine (to the extent technically possible), (b) allow IBM, your reseller or an IBM supplier to process on your behalf any remaining Personal Data as IBM or your reseller considers necessary to fulfill its obligations under this Statement of Limited Warranty (which may include shipping the Machine for such processing to other IBM service locations around the world), and (c) ensure that such processing complies with any laws applicable to such Personal Data.

Limitation of Liability

IBM is responsible for loss of, or damage to, your Machine only while it is 1) in IBM's possession or 2) in transit in those cases where IBM is responsible for the transportation charges.

Neither IBM nor your reseller are responsible for any of your confidential, proprietary or personal information contained in a Machine which you return to IBM for any reason. You should remove all such information from the Machine prior to its return.

Circumstances may arise where, because of a default on IBM's part or other liability, you are entitled to recover damages from IBM. In each such instance, regardless of the basis on which you are entitled to claim damages from IBM (including fundamental breach, negligence, misrepresentation, or other contract or tort claim), except for any liability that cannot be waived or limited by applicable laws, IBM is liable for no more than

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and

2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

This limit also applies to IBM's suppliers and your reseller. It is the maximum for which IBM, its suppliers, and your reseller are collectively responsible.

UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING EVEN IF INFORMED OF THEIR POSSIBILITY: 1) THIRD PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, DATA; 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR 4) LOST PROFITS, BUSINESS REVENUE, GOODWILL OR ANTICIPATED SAVINGS. SOME STATES OR JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU. SOME STATES OR JURISDICTIONS DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

Governing Law

Both you and IBM consent to the application of the laws of the country in which you acquired the Machine to govern, interpret, and enforce all of your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Statement of Limited Warranty, without regard to conflict of law principles.

THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE OR JURISDICTION TO JURISDICTION.

Jurisdiction

All of our rights, duties, and obligations are subject to the courts of the country in which you acquired the Machine.

Part 2 - Country-unique Terms

AMERICAS

ARGENTINA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Ordinary Commercial Court of the city of Buenos Aires.

BOLIVIA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the courts of the city of La Paz.

BRAZIL

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the court of Rio de Janeiro, RJ.

CHILE

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Civil Courts of Justice of Santiago.

COLOMBIA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Judges of the Republic of Colombia.

EQUADOR

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Judges of Quito.

MEXICO

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Federal Courts of Mexico City, Federal District.

PARAGUAY

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the courts of the city of Asuncion.

PERU

Limitation of Liability: *The following is added at the end of this section:*

In accordance with Article 1328 of the Peruvian Civil Code the limitations and exclusions specified in this section will not apply to damages caused by IBM's willful misconduct ("dolo") or gross negligence ("culpa inexcusable").

URUGUAY

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the City of Montevideo Court's Jurisdiction.

VENEZUELA

Jurisdiction: *The following is added after the first sentence:*

Any litigation arising from this Statement of Limited Warranty will be settled exclusively by the Courts of the Metropolitan Area Of the City of Caracas.

NORTH AMERICA

How to Obtain Warranty Service: *The following is added to this Section:*

To obtain warranty service from IBM in Canada or the United States, call 1-800-IBM-SERV (426-7378).

CANADA

Limitation of Liability: *The following replaces item 1 of this section:*

1. damages for bodily injury (including death) or physical harm to real property and tangible personal property caused by IBM's negligence; and

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws in the Province of Ontario.

UNITED STATES

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State of New York.

ASIA PACIFIC

AUSTRALIA

What this Warranty Covers: *The following paragraph is added to this section:*

The warranties specified in this Section are in addition to any rights you may have under the Trade Practices Act 1974 or other similar legislation and are only limited to the extent permitted by the applicable legislation.

Limitation of Liability: *The following is added to this section:*

Where IBM is in breach of a condition or warranty implied by the Trade Practices Act 1974 or other similar legislation, IBM's liability is limited to the repair or replacement of the goods or the supply of equivalent goods. Where that condition or warranty relates to right to sell, quiet possession or clear title, or the goods are of a kind ordinarily acquired for personal, domestic or household use or consumption, then none of the limitations in this paragraph apply.

Governing Law: *The following replaces "laws of the country in which you acquired the Machine" in the first sentence:*

laws of the State or Territory.

CAMBODIA AND LAOS

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence:*

laws of the State of New York, United States of America.

CAMBODIA, INDONESIA, AND LAOS

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Singapore in accordance with the Arbitration Rules of Singapore International Arbitration Center (“SIAC Rules”) then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the SIAC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

HONG KONG S.A.R. OF CHINA AND MACAU S.A.R. OF CHINA

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence:*

laws of Hong Kong Special Administrative Region of China.

INDIA

Limitation of Liability: *The following replaces items 1 and 2 of this section:*

1. liability for bodily injury (including death) or damage to real property and tangible personal property will be limited to that caused by IBM's negligence; and
2. as to any other actual damage arising in any situation involving nonperformance by IBM pursuant to, or in any way related to the subject of this Statement of Limited Warranty, the charge paid by you for the individual Machine that is the subject of the claim. For purposes of this item, the term “Machine” includes Machine Code and Licensed Internal Code (“LIC”).

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Bangalore, India in accordance with the laws of India then in effect. The arbitration award shall be final

and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Bar Council of India. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

JAPAN

Governing Law: *The following sentence is added to this section:*

Any doubts concerning this Statement of Limited Warranty will be initially resolved between us in good faith and in accordance with the principle of mutual trust.

MALAYSIA

Limitation of Liability: *The word “SPECIAL” in item 3 of the fifth paragraph is deleted.*

NEW ZEALAND

What this Warranty Covers: *The following paragraph is added to this section:*

The warranties specified in this section are in addition to any rights you may have under the Consumer Guarantees Act 1993 or other legislation which cannot be excluded or limited. The Consumer Guarantees Act 1993 will not apply in respect of any goods which IBM provides, if you require the goods for the purposes of a business as defined in that Act.

Limitation of Liability: *The following is added to this section:*

Where Machines are not acquired for the purposes of a business as defined in the Consumer Guarantees Act 1993, the limitations in this section are subject to the limitations in that Act.

PEOPLE’S REPUBLIC OF CHINA (PRC)

Governing Law: *The following replaces “laws of the country in which you acquired the Machine” in the first sentence:*

laws of the State of New York, United States of America (except when local law requires otherwise).

PHILIPPINES

Limitation of Liability: *Item 3 in the fifth paragraph is replaced by the following:*

SPECIAL (INCLUDING NOMINAL AND EXEMPLARY DAMAGES), MORAL, INCIDENTAL, OR INDIRECT DAMAGES FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; OR

Arbitration: *The following is added under this heading:*

Disputes arising out of or in connection with this Statement of Limited Warranty shall be finally settled by arbitration which shall be held in Metro Manila, Philippines in accordance with the laws of the Philippines then in effect. The arbitration award shall be final and binding for the parties without appeal and shall be in writing and set forth the findings of fact and the conclusions of law.

The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator. The two arbitrators appointed by the parties shall appoint a third arbitrator who shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the Philippine Dispute Resolution Center, Inc. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

If one of the parties refuses or otherwise fails to appoint an arbitrator within 30 days of the date the other party appoints its, the first appointed arbitrator shall be the sole arbitrator, provided that the arbitrator was validly and properly appointed.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The English language version of this Statement of Limited Warranty prevails over any other language version.

SINGAPORE

Limitation of Liability: *The words “SPECIAL” and “ECONOMIC” in item 3 in the fifth paragraph are deleted.*

EUROPE, MIDDLE EAST, AFRICA (EMEA)

THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:

The terms of this Statement of Limited Warranty apply to Machines purchased from IBM or an IBM reseller.

How to Obtain Warranty Service:

*Add the following paragraph in **Western Europe** (Andorra, Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Vatican State, and any country subsequently added to the European Union, as from the date of accession):*

The warranty for Machines acquired in Western Europe shall be valid and applicable in all Western Europe countries provided the Machines have been announced and made available in such countries.

If you purchase a Machine in one of the Western European countries, as defined above, you may obtain warranty service for that Machine in any of those countries

from either (1) an IBM reseller approved to perform warranty service or (2) from IBM, provided the Machine has been announced and made available by IBM in the country in which you wish to obtain service.

If you purchased a Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

If you purchase a Machine in a Middle Eastern or African country, you may obtain warranty service for that Machine from the IBM entity within the country of purchase, if that IBM entity provides warranty service in that country, or from an IBM reseller, approved by IBM to perform warranty service on that Machine in that country. Warranty service in Africa is available within 50 kilometers of an IBM approved service provider. You are responsible for transportation costs for Machines located outside 50 kilometers of an IBM approved service provider.

Governing Law: *The phrase “the laws of the country in which you acquired the Machine” is replaced by:*

1) “the laws of Austria” in **Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia;** 2) “the laws of France” in **Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna;** 3) “the laws of Finland” in **Estonia, Latvia, and Lithuania;** 4) “the laws of England” in **Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, the United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe;** and 5) “the laws of South Africa” in **South Africa, Namibia, Lesotho and Swaziland.**

Jurisdiction: *The following exceptions are added to this section:*

1) **In Austria** the choice of jurisdiction for all disputes arising out of this Statement of Limited Warranty and relating thereto, including its existence, will be the competent court of law in Vienna, Austria (Inner-City); 2) **in Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, West Bank/Gaza, Yemen, Zambia, and Zimbabwe** all disputes arising out of this Statement of Limited Warranty or related to its execution, including summary proceedings, will be submitted to the exclusive jurisdiction of the English courts; 3) in **Belgium and Luxembourg**, all disputes arising out of this Statement of Limited Warranty or related to its interpretation or its execution, the law, and the courts of the capital city, of the country of your registered office and/or commercial site location only are competent; 4) **in France, Algeria, Benin, Burkina**

Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo Republic, Djibouti, Democratic Republic of Congo, Equatorial Guinea, French Guiana, French Polynesia, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Madagascar, Mali, Mauritania, Mauritius, Mayotte, Morocco, New Caledonia, Niger, Reunion, Senegal, Seychelles, Togo, Tunisia, Vanuatu, and Wallis & Futuna all disputes arising out of this Statement of Limited Warranty or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 5) **in Russia**, all disputes arising out of or in relation to the interpretation, the violation, the termination, the nullity of the execution of this Statement of Limited Warranty shall be settled by Arbitration Court of Moscow; 6) **in South Africa, Namibia, Lesotho and Swaziland**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the High Court in Johannesburg; 7) **in Turkey** all disputes arising out of or in connection with this Statement of Limited Warranty shall be resolved by the Istanbul Central (Sultanahmet) Courts and Execution Directorates of Istanbul, the Republic of Turkey; 8) in each of the following specified countries, any legal claim arising out of this Statement of Limited Warranty will be brought before, and settled exclusively by, the competent court of a) Athens for **Greece**, b) Tel Aviv-Jaffa for **Israel**, c) Milan for **Italy**, d) Lisbon for **Portugal**, and e) Madrid for **Spain**; and 9) **in the United Kingdom**, both of us agree to submit all disputes relating to this Statement of Limited Warranty to the jurisdiction of the English courts.

Arbitration: *The following is added under this heading:*

In Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, FYR Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan, and FR Yugoslavia all disputes arising out of this Statement of Limited Warranty or related to its violation, termination or nullity will be finally settled under the Rules of Arbitration and Conciliation of the International Arbitral Center of the Federal Economic Chamber in Vienna (Vienna Rules) by three arbitrators appointed in accordance with these rules. The arbitration will be held in Vienna, Austria, and the official language of the proceedings will be English. The decision of the arbitrators will be final and binding upon both parties. Therefore, pursuant to paragraph 598 (2) of the Austrian Code of Civil Procedure, the parties expressly waive the application of paragraph 595 (1) figure 7 of the Code. IBM may, however, institute proceedings in a competent court in the country of installation.

In Estonia, Latvia and Lithuania all disputes arising in connection with this Statement of Limited Warranty will be finally settled in arbitration that will be held in Helsinki, Finland in accordance with the arbitration laws of Finland then in effect. Each party will appoint one arbitrator. The arbitrators will then jointly appoint the chairman. If arbitrators cannot agree on the chairman, then the Central Chamber of Commerce in Helsinki will appoint the chairman.

EUROPEAN UNION (EU)

THE FOLLOWING TERMS APPLY TO ALL EU COUNTRIES:

The warranty for Machines acquired in EU countries is valid and applicable in all EU countries provided the Machines have been announced and made available in such countries.

How to Obtain Warranty Service: *The following is added to this section:*

To obtain warranty service from IBM in EU countries, see the telephone listing in Part 3 - Warranty Information.

You may contact IBM at the following address:

IBM Warranty & Service Quality Dept.
PO Box 30
Spango Valley
Greenock
Scotland PA16 0AH

CONSUMERS

Consumers have legal rights under applicable national legislation governing the sale of consumer goods. Such rights are not affected by the warranties provided in this Statement of Limited Warranty.

AUSTRIA, DENMARK, FINLAND, GREECE, ITALY, NETHERLANDS, NORWAY, PORTUGAL, SPAIN, SWEDEN AND SWITZERLAND

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:

1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty or due to any other cause related to this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault) or of such cause, for a maximum amount equal to the charges you paid for the Machine. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC"). The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.
2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

FRANCE AND BELGIUM

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

Except as otherwise provided by mandatory law:

1. IBM's liability for any damages and losses that may arise as a consequence of the fulfillment of its obligations under or in connection with this Statement of Limited Warranty is limited to the compensation of only those damages and losses proved and actually arising as an immediate and direct consequence of the non-fulfillment of such obligations (if IBM is at fault), for a maximum amount equal to the charges you paid for the Machine that has caused the damages. For purposes of this item, the term "Machine" includes Machine Code and

Licensed Internal Code (“LIC”). The above limitation shall not apply to damages for bodily injuries (including death) and damages to real property and tangible personal property for which IBM is legally liable.

2. **UNDER NO CIRCUMSTANCES IS IBM, ITS SUPPLIERS OR RESELLERS LIABLE FOR ANY OF THE FOLLOWING, EVEN IF INFORMED OF THEIR POSSIBILITY: 1) LOSS OF, OR DAMAGE TO, DATA; 2) INCIDENTAL OR INDIRECT DAMAGES, OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES; 3) LOST PROFITS, EVEN IF THEY ARISE AS AN IMMEDIATE CONSEQUENCE OF THE EVENT THAT GENERATED THE DAMAGES; OR 4) LOSS OF BUSINESS, REVENUE, GOODWILL, OR ANTICIPATED SAVINGS.**

THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:

AUSTRIA

The provisions of this Statement of Limited Warranty replace any applicable statutory warranties.

What this Warranty Covers: *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine’s conformity to its Specifications.

The following paragraphs are added to this section:

The limitation period for consumers in action for breach of warranty is the statutory period as a minimum. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

The second paragraph does not apply.

What IBM Will Do to Correct Problems: *The following is added to this section:*

During the warranty period, IBM will reimburse you for the transportation charges for the delivery of the failing Machine to IBM.

Limitation of Liability: *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM’s liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

EGYPT

Limitation of Liability: *The following replaces item 2 in this section:*

as to any other actual direct damages, IBM's liability will be limited to the total amount you paid for the Machine that is the subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code ("LIC").

Applicability of suppliers and resellers (unchanged).

FRANCE

Limitation of Liability: *The following replaces the second sentence of the first paragraph of this section:*

In such instances, regardless of the basis on which you are entitled to claim damages from IBM, IBM is liable for no more than: (items 1 and 2 unchanged).

GERMANY

What this Warranty Covers: *The following replaces the first sentence of the first paragraph of this section:*

The warranty for an IBM Machine covers the functionality of the Machine for its normal use and the Machine's conformity to its Specifications.

The following paragraphs are added to this section:

The minimum warranty period for Machines is twelve months. In case IBM or your reseller is unable to repair an IBM Machine, you can alternatively ask for a partial refund as far as justified by the reduced value of the unrepaired Machine or ask for a cancellation of the respective agreement for such Machine and get your money refunded.

The second paragraph does not apply.

What IBM Will Do to Correct Problems: *The following is added to this section:*

During the warranty period, transportation for delivery of the failing Machine to IBM will be at IBM's expense.

Limitation of Liability: *The following paragraph is added to this section:*

The limitations and exclusions specified in the Statement of Limited Warranty will not apply to damages caused by IBM with fraud or gross negligence and for express warranty.

The following sentence is added to the end of item 2:

IBM's liability under this item is limited to the violation of essential contractual terms in cases of ordinary negligence.

HUNGARY

Limitation of Liability: *The following is added at the end of this section:*

The limitation and exclusion specified herein shall not apply to liability for a breach of contract damaging life, physical well-being, or health that has been caused intentionally, by gross negligence, or by a criminal act.

The parties accept the limitations of liability as valid provisions and state that the Section 314.(2) of the Hungarian Civil Code applies as the acquisition price as well as other advantages arising out of the present Statement of Limited Warranty balance this limitation of liability.

IRELAND

What this Warranty Covers: *The following is added to this section:*

Except as expressly provided in these terms and conditions, all statutory conditions, including all warranties implied, but without prejudice to the generality of the foregoing all warranties implied by the Sale of Goods Act 1893 or the Sale of Goods and Supply of Services Act 1980 are hereby excluded.

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a “Default” means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default occurring on the date of occurrence of the last such Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM’s liability and your sole remedy.

1. IBM will accept unlimited liability for death or personal injury caused by the negligence of IBM.
2. Subject always to the **Items for Which IBM is Not Liable** below, IBM will accept unlimited liability for physical damage to your tangible property resulting from the negligence of IBM.
3. Except as provided in items 1 and 2 above, IBM’s entire liability for actual damages for any one Default will not in any event exceed the greater of 1) EUR 125,000, or 2) 125% of the amount you paid for the Machine directly relating to the Default.

Items for Which IBM is Not Liable

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM, its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:

1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

SLOVAKIA

Limitation of Liability: *The following is added to the end of the last paragraph:*

The limitations apply to the extent they are not prohibited under §§ 373-386 of the Slovak Commercial Code.

SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

Limitation of Liability: *The following is added to this section:*

IBM's entire liability to you for actual damages arising in all situations involving nonperformance by IBM in respect of the subject matter of this Statement of Warranty will be limited to the charge paid by you for the individual Machine that is the subject of your claim from IBM.

UNITED KINGDOM

Limitation of Liability: *The following replaces the terms of this section in its entirety:*

For the purposes of this section, a "Default" means any act, statement, omission, or negligence on the part of IBM in connection with, or in relation to, the subject matter of this Statement of Limited Warranty in respect of which IBM is legally liable to you, whether in contract or tort. A number of Defaults which together result in, or contribute to, substantially the same loss or damage will be treated as one Default.

Circumstances may arise where, because of a Default, you are entitled to recover damages from IBM.

This section sets out the extent of IBM's liability and your sole remedy.

1. IBM will accept unlimited liability for:
 - a. death or personal injury caused by the negligence of IBM; and
 - b. any breach of its obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982, or any statutory modification or re-enactment of either such Section.
2. IBM will accept unlimited liability, subject always to the **Items for Which IBM is Not Liable** below, for physical damage to your tangible property resulting from the negligence of IBM.
3. IBM's entire liability for actual damages for any one Default will not in any event, except as provided in items 1 and 2 above, exceed the greater of 1) Pounds Sterling 75,000, or 2) 125% of the total purchase price payable or the charges for the Machine directly relating to the Default.

These limits also apply to IBM's suppliers and resellers. They state the maximum for which IBM and such suppliers and resellers are collectively responsible.

Items for Which IBM is Not Liable

Save with respect to any liability referred to in item 1 above, under no circumstances is IBM or any of its suppliers or resellers liable for any of the following, even if IBM or they were informed of the possibility of such losses:

1. loss of, or damage to, data;
2. special, indirect, or consequential loss; or
3. loss of profits, business, revenue, goodwill, or anticipated savings.

Part 3 - Warranty Information

This Part 3 provides information regarding the warranty applicable to your Machine, including the warranty period and type of warranty service IBM provides.

Warranty Period

The warranty period may vary by country or region and is specified in the table below.

Note: “Region” means either Hong Kong or Macau Special Administrative Region of China.

A warranty period of 3 years on parts and 1 year on labor means that IBM provides warranty service without charge for:

1. parts and labor during the first year of the warranty period; and
2. parts only, on an exchange basis, in the second and third years of the warranty period. IBM will charge you for any labor provided in performance of the repair or replacement(s) in the second and third year of the warranty period.

Machine - Cisco Systems 4 Gb 10 Port Fibre Channel Switch Module for IBM BladeCenter or Cisco Systems 4 Gb 20 Port Fibre Channel Switch Module for IBM BladeCenter

Country or Region of Purchase	Warranty Period	Type of Warranty Service*
Worldwide	1 year	1
* See “Types of Warranty Service” for the legend and explanations of warranty-service types.		

Types of Warranty Service

If required, IBM provides repair or exchange service depending on the type of warranty service specified for your Machine in the above table and as described below. Warranty service may be provided by your reseller if approved by IBM to perform warranty service. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations, additional charges may apply outside IBM’s normal service area, contact your local IBM representative or your reseller for country and location specific information.

1. Customer Replaceable Unit (“CRU”) Service

IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your Machine and are available from IBM at any time on your request. Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation. You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service designated for your Machine. IBM specifies in the materials shipped with a replacement CRU whether a defective CRU must be returned to IBM. When return is required, 1) return instructions and a container are shipped with the replacement CRU, and 2) you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

2. On-site Service

IBM or your reseller will either repair or exchange the failing Machine at your location and verify its operation. You must provide suitable working area to allow disassembly and reassembly of the IBM Machine. The area must be clean, well lit and suitable for the purpose. For some Machines, certain repairs may require sending the Machine to an IBM service center.

3. Courier or Depot Service*

You will disconnect the failing Machine for collection arranged by IBM. IBM will provide you with a shipping container for you to return your Machine to a designated service center. A courier will pick up your Machine and deliver it to

the designated service center. Following its repair or exchange, IBM will arrange the return delivery of the Machine to your location. You are responsible for its installation and verification.

4. Customer Carry-In or Mail-In Service

You will deliver or mail as IBM specifies (prepaid unless IBM specifies otherwise) the failing Machine suitably packaged to a location IBM designates. After IBM has repaired or exchanged the Machine, IBM will make it available for your collection or, for Mail-in Service, IBM will return it to you at IBM's expense, unless IBM specifies otherwise. You are responsible for the subsequent installation and verification of the Machine.

5. CRU and On-site Service

This type of Warranty Service is a combination of Type 1 and Type 2 (see above).

6. CRU and Courier or Depot Service

This type of Warranty Service is a combination of Type 1 and Type 3 (see above).

7. CRU and Customer Carry-In or Mail-In Service

This type of Warranty Service is a combination of Type 1 and Type 4 (see above).

When a 5, 6 or 7 type of warranty service is listed, IBM will determine which type of warranty service is appropriate for the repair.

* This type of service is called ThinkPad® EasyServ or EasyServ in some countries.

The IBM Machine Warranty World Wide Web site at http://www.ibm.com/servers/support/machine_warranties/ provides a worldwide overview of IBM's Limited Warranty for Machines, a Glossary of IBM definitions, Frequently Asked Questions (FAQs) and Support by Product (Machine) with links to Product Support pages. **The IBM Statement of Limited Warranty is also available on this site in 29 languages.**

To obtain warranty service contact IBM or your IBM reseller. In Canada or the United States, call 1-800-IBM-SERV (426-7378). In the EU countries, see the telephone numbers below.

EU Country Telephone List

Phone numbers are subject to change without notice. For the warranty service contact telephone number in a country subsequently added to the EU and not yet reflected in the list below, contact IBM in that country or visit the website above for a current telephone listing.

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Cyprus -- +357-22-841100	Luxembourg -- +352-298-977-5063
Czech Republic -- +420-2-7213-1316	Malta -- +356-23-4175
Denmark -- +45-4520-8200	Netherlands -- +31-20-514-5770
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France -- +33-238-557-450	Slovakia -- +421-2-4954-1217

Germany -- +49-1805-253553	Slovenia -- +386-1-4796-699
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Hungary -- +36-1-382-5720	Sweden -- +46-8-477-4420
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Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

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When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 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 may 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 available from IBM.

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This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

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For the European Union:



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The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product/part may include a lithium manganese dioxide battery which contains a perchlorate substance.

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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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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.

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

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European Community contact:
IBM Technical Regulations
Pascalstr. 100, Stuttgart, Germany 70569
Telephone: 0049 (0)711 785 1176
Fax: 0049 (0)711 785 1283
E-mail: tjahn@de.ibm.com

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