

BladeCenter T
Advanced Management Module



Installation Guide

BladeCenter T
Advanced Management Module



Installation Guide

Note:

Before using this information and the product it supports, read the general information in Appendix B, "IBM Statement of Limited Warranty Z125-4753-08 04/2004," on page 51 and Appendix C, "Notices," on page 75.

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Contents

Safety	v
Chapter 1. Introduction	1
Related documentation	2
The IBM Documentation CD	3
System requirements.	3
Using the Documentation Browser	4
Notices and statements used in this document	5
Overview of the management module	6
Chapter 2. Installing and removing a management module.	9
Installation guidelines	9
System reliability considerations	10
Handling static-sensitive devices	11
Preparing for management-module redundancy	12
Installing a management module	14
Removing a management module	19
Connecting to the management module	22
Cabling the KVM and LAN modules	23
Cabling the KVM module ports	24
Cabling the LAN module Ethernet ports.	24
Cabling the serial port.	27
Connecting to the management module for the first time	30
Ethernet connection (Web-based)	30
Ethernet connection (CLI)	31
Serial connection (CLI)	31
Chapter 3. Management, KVM, and LAN module LEDs and external ports	33
Management module controls, indicators, and input/output connectors	33
KVM (keyboard, video, mouse) module indicators and input/output connectors	35
LAN-module indicators and input/output connectors	38
Chapter 4. Configuring the management module	41
Establishing and configuring a remote Ethernet-port connection	41
Communicating with the IBM Director software	43
Starting the management and configuration program	44
Configuring the management module	45
Appendix A. Getting help and technical assistance	49
Before you call	49
Using the documentation.	49

Getting help and information from the World Wide Web	50
Software service and support	50
Hardware service and support	50
Appendix B. IBM Statement of Limited Warranty Z125-4753-08 04/2004	51
Part 1 - General Terms.	51
Part 2 - Country-unique Terms	55
Part 3 - Warranty Information	71
Appendix C. Notices	75
Edition notice	76
Trademarks	76
Important notes	77
Product recycling and disposal	78
Battery return program	79
Electronic emission notices	80
Federal Communications Commission (FCC) statement.	80
Industry Canada Class A emission compliance statement	80
Australia and New Zealand Class A statement	80
United Kingdom telecommunications safety requirement	81
European Union EMC Directive conformance statement	81
Taiwanese Class A warning statement	81
Chinese Class A warning statement	82
Japanese Voluntary Control Council for Interference (VCCI) statement	82
Index	83

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.

在安裝本产品之前，请仔细阅读 **Safety Information**
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

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

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

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

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

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

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

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

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

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si 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:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM Safety Information* book.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM Safety Information* book under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your 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 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.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Chapter 1. Introduction

This *IBM BladeCenter T Advanced Management Module Installation Guide* contains information about installing and configuring the IBM® BladeCenter® T Advanced Management Module. This document also describes the following tasks and items:

- Cabling the ports on the associated keyboard, video, mouse (KVM) and local area network (LAN) modules on the BladeCenter T unit
- Cabling the serial port on the Advanced Management Module
- Connecting to the Advanced Management Module
- Controls, indicators, and input/output (I/O) connectors on the Advanced Management Module
- Indicators and I/O connectors on the associated KVM and LAN modules on the BladeCenter T unit
- Management-module redundancy

For installation and cabling details, see Chapter 2, “Installing and removing a management module,” on page 9. For details about the controls, indicators, and I/O connectors, see Chapter 3, “Management, KVM, and LAN module LEDs and external ports,” on page 33. For configuration details, see Chapter 4, “Configuring the management module,” on page 41. For additional information, see the instructions in your BladeCenter T documents.

The Advanced Management Module is a hot-swap BladeCenter module that you use to configure and manage all installed BladeCenter components. The Advanced Management Module is referred to throughout this document as the management module.

You can install a maximum of two management modules in the BladeCenter T unit, such as the IBM BladeCenter T Type 8720 or 8730 enclosure. The BladeCenter T unit requires at least one operational management module. If you install two management modules in the BladeCenter T unit, the management modules must be identical. The BladeCenter T unit does not support the operation of two different types of management modules in the same enclosure. Only one management module can be active; the second management module, if present, provides redundancy.

You can obtain up-to-date information about the management module and other IBM BladeCenter products at <http://www.ibm.com/bladecenter/>. You can obtain information about other IBM products at <http://www.ibm.com/support/>.

Record information about the management modules in the following table.

Product name	IBM BladeCenter T Advanced Management Module
Serial number	1. Management Module 1 _____ 2. Management Module 2 _____
Media access control (MAC) address	1. Management Module 1 _____ 2. Management Module 2 _____

The product name and serial number are on the identification label on the top center of the BladeCenter T Advanced Management Module. You will need this information when you register your BladeCenter T Advanced Management Module on the IBM Support Web page (see <http://www.ibm.com/support/mysupport/>). The media access control (MAC) address is on a label at the front of the management module. See “Overview of the management module” on page 6 for an illustration that shows the location of the identification label.

Related documentation

In addition to this *Installation Guide*, the following documentation might be on the IBM *BladeCenter T Advanced Management Module Documentation* CD that comes with your BladeCenter T management module. Depending on your BladeCenter product, additional documents might also be included on the IBM *BladeCenter T Advanced Management Module Documentation* CD. The most recent versions of all BladeCenter documentation are at <http://www.ibm.com/support/>.

- *Safety Information*

This document contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* document.

- *BladeCenter Management Module User's Guide*

This document provides general information about the management module for your BladeCenter or BladeCenter T unit type, including information about features, how to configure the management module, and how to get help.

- *BladeCenter Management Module Command-Line Interface Reference Guide*

This document explains how to use the management-module command-line interface (CLI) to directly access BladeCenter management functions as an alternative to using the Web-based user interface. The command-line interface also provides access to the text-console command prompt on each blade server through a serial over LAN (SOL) connection.

- *IBM BladeCenter Serial over LAN Setup Guide*

This document explains how to update and configure BladeCenter components for SOL operation. The SOL connection provides access to the text-console command prompt on each blade server, enabling the blade servers to be managed from a remote location.

In addition to the documentation in this library, be sure to review the *IBM BladeCenter T Planning and Installation Guide* for your BladeCenter T unit type for information to help you prepare for system installation and configuration. This document is available at <http://www.ibm.com/bladecenter/>.

The IBM Documentation CD

The BladeCenter T management module comes with the *IBM BladeCenter T Advanced Management Module Documentation CD*, which contains documentation for your system in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

System requirements

To run the documentation CD, use a system that has the following minimum hardware and software:

- Microsoft® Windows NT® 4.0 (with Service Pack 3 or later), Windows® 2000, SUSE LINUX, or Red Hat Linux®.
- 100 MHz Intel® microprocessor.
- 32 MB RAM.
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems. Acrobat Reader software is included on the CD, and you can install it when you run the Documentation Browser.

Using the Documentation Browser

Use the Documentation Browser to browse the contents of the CD, read brief descriptions of the documents, and view documents using Adobe Acrobat Reader or xpdf. The Documentation Browser automatically detects the regional settings in use on your system and presents the information in the language for that region (if available). If a topic is not available in the language for that region, the English version is displayed.

Use one of the following procedures to start the Documentation Browser:

- If Autostart is enabled, insert the documentation CD into your optical drive. The Documentation Browser will start automatically.
- If Autostart is disabled or is not enabled for all users:
 - If you are using a Windows operating system, insert the documentation CD into your optical drive; then, click **Start --> Run**. In the **Open** field, type
`e:\win32.bat`
where *e* is the drive letter of your optical drive, and click **OK**.
 - If you are using a Linux operating system, insert the documentation CD into your optical drive and run the following command from the `/mnt/cdrom` directory:
`sh runlinux.sh`

Select your computer from the **Product** menu. The **Available Topics** list displays all the documents for your computer. Some documents might be in folders. A plus sign (+) indicates each folder or document that has additional topics under it. Click the plus sign to display the additional documents.

When you select a document, a description of the document appears under **Topic Description**. To select more than one document, press and hold the **Ctrl** key while you select the documents. Click **View Book** to view the selected document or documents in Acrobat Reader or xpdf. If you selected more than one document, all the selected documents are opened in Acrobat Reader or xpdf.

To search all the documents, type a word or word string in the **Search** field and click **Search**. The documents in which the word or word string appears are listed in order of the most occurrences. Click a document to view it, and press **Ctrl+F** to use the Acrobat search function or press **Alt+F** to use the xpdf search function within the document.

Click **Help** for detailed information about using the Documentation Browser.

Notices and statements used in this document

The caution and danger statements that appear in this document are also in the multilingual *Safety Information* document, which is on the IBM *BladeCenter T Advanced Management Module Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* document.

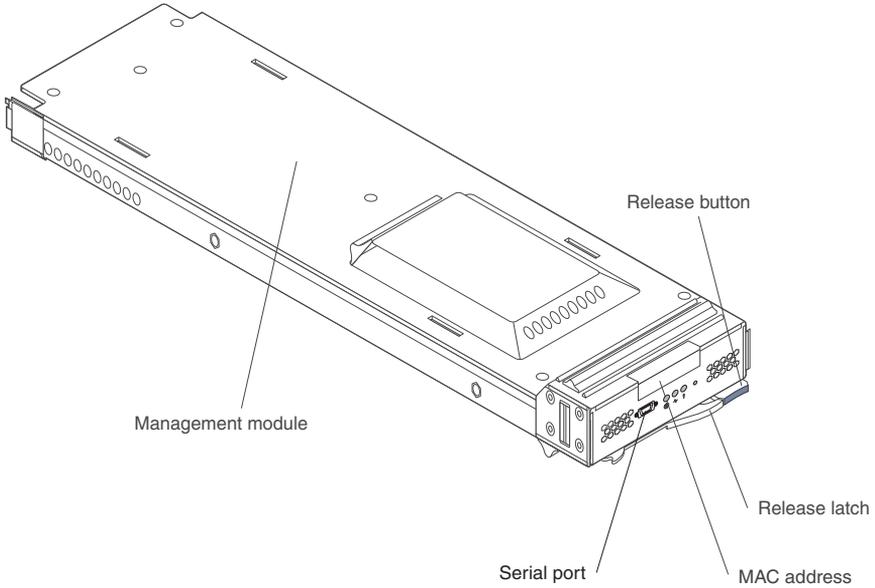
The following notices and statements are used in this document:

- **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 possible 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.

Overview of the management module

The following illustration shows the management module.

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



The IBM BladeCenter T Advanced Management Module is a hot-swap unit that is installed into the front of the BladeCenter T unit. The BladeCenter T unit supports two management modules. If you install two management modules in the BladeCenter T unit, they must be identical. Only one management module is active. The active management module is also known as the primary management module. If a secondary management module is installed in the BladeCenter T unit, this management module is in passive or standby mode by default. If the active or primary management module fails, the secondary management module is automatically enabled with all the configuration settings of the primary management module. For additional information about redundancy, see “Preparing for management-module redundancy” on page 12.

To configure and manage the installed BladeCenter components, the Advanced Management Module communicates through the external I/O connectors on the associated KVM and LAN modules on the BladeCenter T unit. The front of the management module also contains a serial connector (port) for use with the

command-line interface (CLI). For information about the indicators and I/O connectors on the front of the management module, and the associated KVM and LAN modules, see Chapter 3, “Management, KVM, and LAN module LEDs and external ports,” on page 33.

The management module performs system-management functions for the BladeCenter T unit. Through the management module, you can configure the BladeCenter T unit and modules, and such information as the Internet protocol (IP) addresses of the management module and I/O modules. The management module also performs PS/2-to-USB conversions for the system keyboard and mouse and can send the video graphics array (VGA) data stream to a remote console for viewing.

The management module communicates with the service processor in each blade server for functions such as:

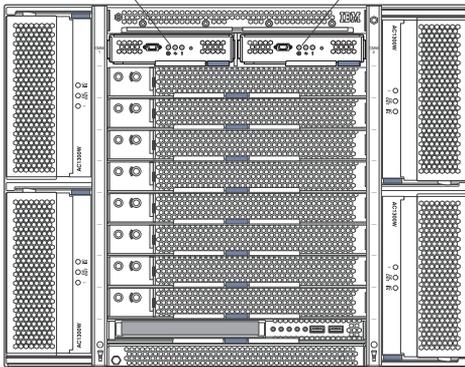
- Blade server power-on requests
- Blade server error and event reporting
- Blade server requests for keyboard, mouse, and video
- Blade server requests for optical drive and Universal Serial Bus (USB) ports

In addition to blade servers, the management module also communicates with the I/O modules, power modules, blower modules, and the media tray in the BladeCenter T unit to detect their presence or absence and any error conditions, sending alerts when required.

Chapter 2. Installing and removing a management module

The following illustration shows the management-module bay locations on the front of the BladeCenter T unit.

Management-module bay 1 Management-module bay 2



Installation guidelines

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

- Read the safety information beginning on page v and the handling guidelines in “Handling static-sensitive devices” on page 11, and read the safety statements in the BladeCenter T unit publications.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Do not attempt to lift an object that you think is too heavy for you. If you have to lift a heavy object, observe the following precautions:
 - Make sure that you can stand safely without slipping.
 - Distribute the weight of the object equally between your feet.
 - Use a slow lifting force. Never move suddenly or twist when you lift a heavy object.
 - To avoid straining the muscles in your back, lift by standing or by pushing up with your leg muscles.
- Make sure that you have an adequate number of properly grounded electrical outlets for the BladeCenter T unit monitor, and other devices.

- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the server, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that you can remove or install the component while the BladeCenter T unit is running. (Orange can also indicate touch points on hot-swap components.) For complete details about installing or removing a management module, see the detailed information in this chapter.
- You do not have to disconnect the BladeCenter T unit from power to install or replace any of the hot-swap modules in the BladeCenter T unit. You must shut down the operating system and turn off a hot-swap blade server on the front of the BladeCenter T unit before removing the blade server, but you do not need to shut down the BladeCenter T unit itself.
- For a list of supported options for your BladeCenter T unit, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

System reliability considerations

Attention: To help ensure proper cooling and system reliability, make sure that:

- Each of the module bays in the BladeCenter T unit has either a module or filler module installed.
- Each of the blade bays on the front of the BladeCenter T unit has either a blade server or filler blade installed.
- Each of the drive bays in a blade server storage expansion option has either a hot-swap drive or a filler panel installed.
- A removed hot-swap module or drive is replaced within 1 minute of removal. Failure to replace a module or drive with another module, drive, or filler module within 1 minute can affect performance in the blade servers.
- A removed blade server is replaced within 20 minutes of removal. Failure to replace a blade server with another blade server or filler blade within 20 minutes can affect performance in the blade servers.
- A failed blower is replaced as soon as possible, to restore cooling redundancy.
- If the BladeCenter T unit contains two management modules, the management modules are the same type. Operating the BladeCenter T unit with two different types of management modules will affect system performance.
- You have followed the reliability guidelines in the documentation that comes with the BladeCenter T unit.

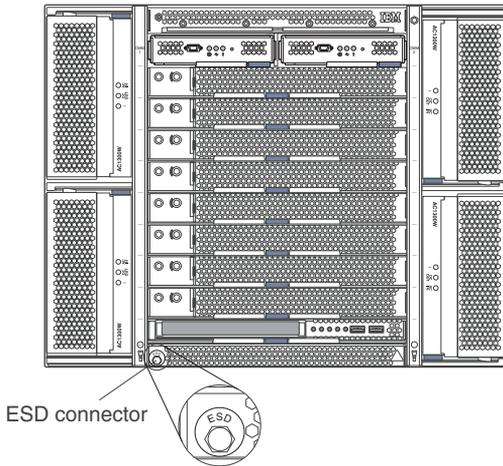
Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your BladeCenter T unit. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

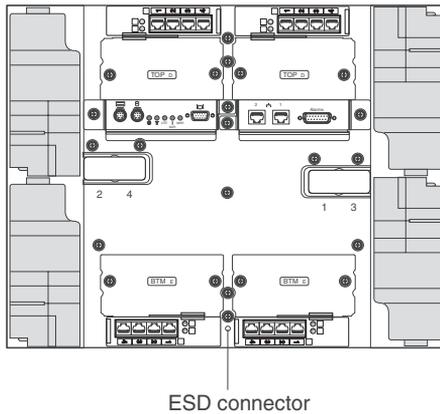
Use an ESD wrist strap and the ESD connectors on the BladeCenter T unit. Electrostatic discharge (ESD) is the release of stored static electricity that can damage electric circuits. Static electricity is often stored in your body and discharged when you come in contact with an object with a different potential. The ESD wrist strap safely channels the electricity from your body to a proper ground (the BladeCenter T unit).

Use an ESD wrist strap whenever you are working on the BladeCenter T unit, especially when you are handling modules, options, and blade servers. To work properly, the wrist strap must have a good contact at both ends (touching your skin at one end and connected to the ESD connector on the front or back of the BladeCenter T unit.)

Location of ESD connector (front of unit)



Location of ESD connector (rear of unit)



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 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 any *unpainted* metal surface of the BladeCenter T unit or any *unpainted* metal surface on any other grounded rack component 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 T unit without setting down the device. If it is necessary to set down the device, place it back into its static-protective package. Do not place the device on the BladeCenter T unit or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Preparing for management-module redundancy

When two management modules are installed in a BladeCenter T unit, only one management module is active; the second management module, if present, provides redundancy. The active management module is the primary module; the redundant module is the secondary module. If the primary management module fails, or if you request a changeover through the Web interface, the secondary management module becomes active and primary.

Management-module redundancy requires specific minimum levels of firmware. If you intend to install a second management module in the

BladeCenter T unit, make sure that you have downloaded and applied the latest level of firmware from the IBM Support Web site.

If two management modules are installed in a BladeCenter T unit, both must always have the same level of firmware and same IP address; and the firmware must support redundant management-module function to enable changeover of control from the primary (active) management module to the redundant management module. The latest level of management-module firmware is available at <http://www.ibm.com/support/>.

Note: After failover, you might not be able to establish a network connection to the management module for 5 minutes.

Complete the following steps to prepare the management modules for redundancy:

1. Go to the IBM Support Web site at <http://www.ibm.com/support/> to check for technical information, hints, tips, and the latest firmware.
2. Download the latest management-module firmware and use the management-module Web interface to apply it to your current primary management module (see “Starting the management and configuration program” on page 44 for detailed instructions about logging in to the Web interface). You must update all parts of the management-module firmware that are in the download.
 - a. On the **MM Control** page, click **Firmware Update**.
 - b. Click **Browse** to locate the firmware file that you want; then, click **Update**. Follow the instructions on the screen.
3. Install the second management module in the available management-module bay (see “Installing a management module” on page 14 for instructions).
4. Wait while the primary management module transfers the configuration information to the second (redundant) management module. If the firmware in the primary management module is a different version than that in the second management module, the firmware in the second management module is updated to the firmware version that is present in the primary (already installed) management module. This update takes place when the redundant management module is installed. It can take up to 45 minutes to update the firmware in the redundant management module and transfer the management-module configuration.

The management modules are now prepared for redundancy.

Important: Make sure that the role or command authority level set for each user is correct after updating management-module firmware, as these definitions might change between firmware versions.

Notes:

1. Whenever power is restored to a BladeCenter T unit that has two functional management modules installed, the management module in bay 1 is automatically the active management module, even if the module in bay 2 was the active module before power was removed.
2. Go to the IBM Support Web site at <http://www.ibm.com/support/> for the most recent version of IBM Director software or other systems-management software that you can use to manage redundant management modules.

For more information about configuring the management module, see the *BladeCenter Management Module User's Guide*.

Installing a management module

Statement 8:



CAUTION:

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

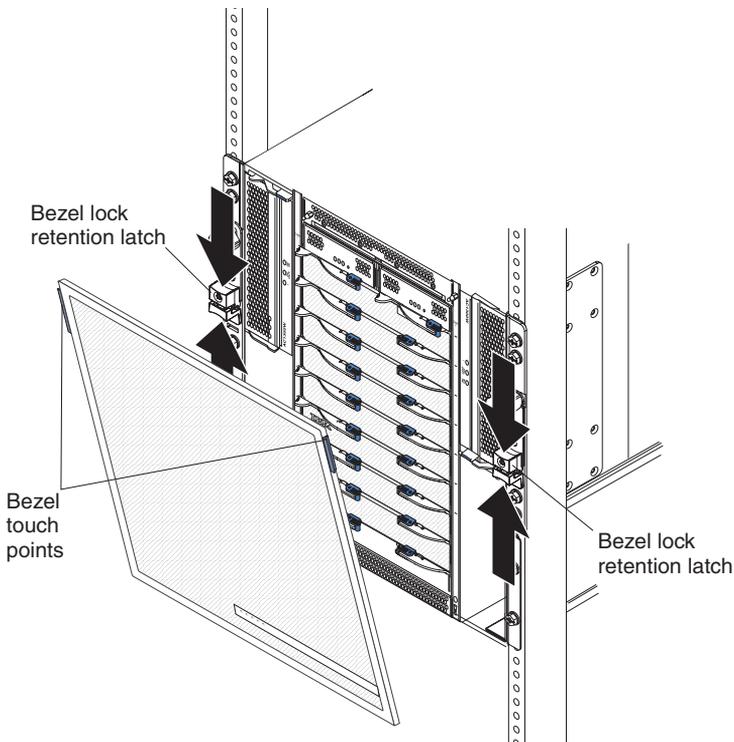


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

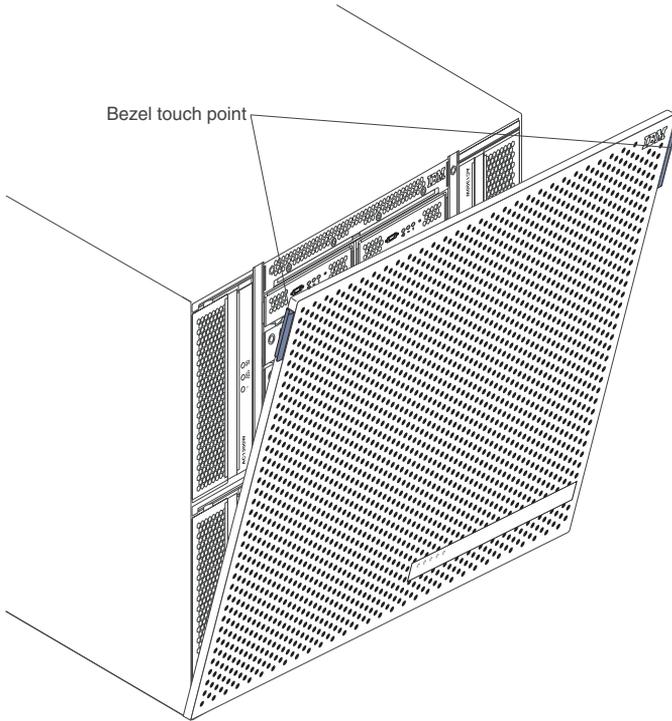
Complete the following steps to install a management module at the front of the BladeCenter T unit:

1. Read the safety information beginning on page v and “Installation guidelines” on page 9 through “Handling static-sensitive devices” on page 11.
2. If you are installing a second management module, read “Preparing for management-module redundancy” on page 12.

3. If you are replacing the only management module in the BladeCenter T unit and the management module is functional, you might want to save the configuration file to another medium before you proceed.
 - To save the configuration file, click **Configuration File** under the **MM Control** section in the navigation pane and follow the instructions under **Backup MM Configuration**.
 - To restore the saved configuration file to the replacement management module, click **Configuration File** under the **MM Control** section in the navigation pane and follow the instructions under **Restore MM Configuration**).
- See the *BladeCenter Management Module User's Guide* for more information.
4. Squeeze the upper and lower halves of the bezel-lock retention latches together to open the bezel locks on each side as shown in the illustration; then, forcefully pull forward on the blue touch points at the top sides of the bezel.

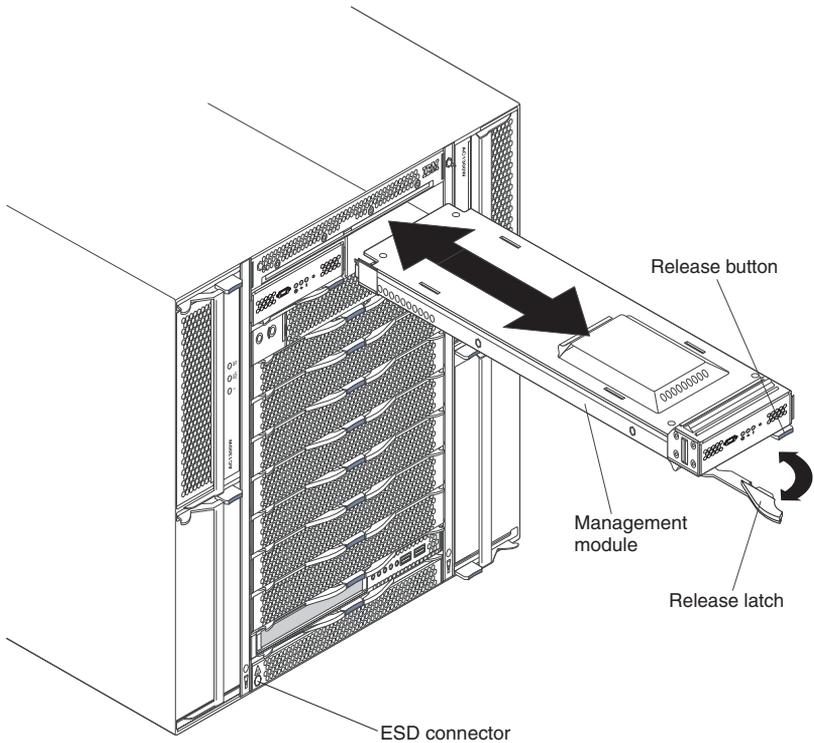


5. Pull the bezel outward from the top and then lift it up and away from the BladeCenter T unit. Carefully set the bezel aside in a safe location.



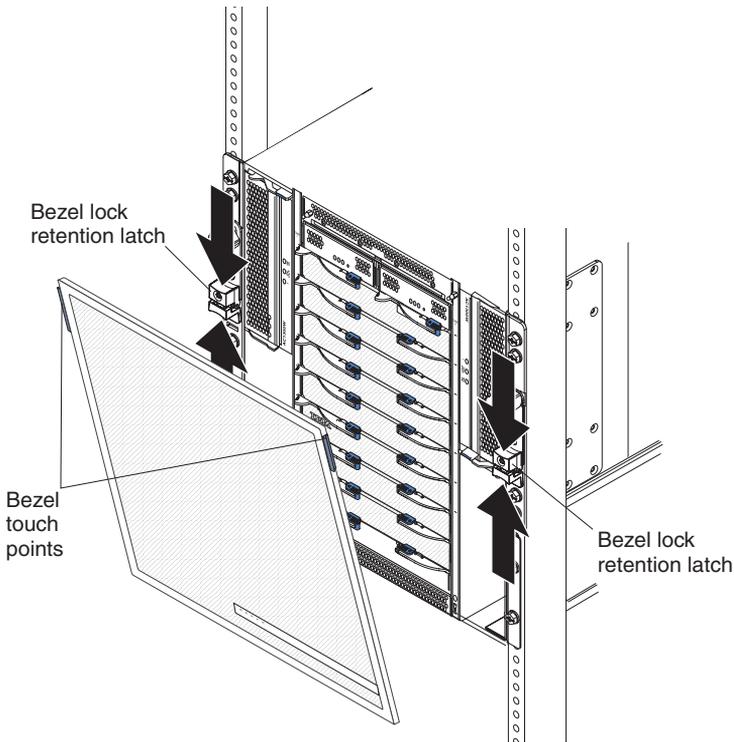
6. If you are replacing a management module, remove the current module from the bay (see “Removing a management module” on page 19). If you are adding a management module, remove the filler module from the selected management-module bay and store the filler module for future use.

7. Connect an ESD wrist strap to the ESD connector at the front of the BladeCenter T unit (see the illustration on page 11 for the location of the ESD connector) and place the wrist strap around your wrist. If you have not already done so, touch the static-protective package that contains the management module to an unpainted metal part of the BladeCenter T unit or any unpainted surface on any other grounded rack component for at least 2 seconds.
8. Remove the management module from its static-protective package.



9. Press the blue release button on the management module to open the release latch. Make sure that the release latch on the management module is in the open position (parallel to the module).
10. Holding the management module at the front with one hand and in the middle with the other hand, align the management module with the management-module bay. The side of the management module with the release latch must be facing down.
11. Gently slide the management module into the selected management-module bay until it stops. Push the management module in the rest of the way until the latch starts to close.

12. Push the release latch on the front of the management module to the closed position.
13. Make sure that the amber error light-emitting diode (LED) on each management module is not lit, indicating that the management module is operating correctly. For additional information, see “Management module controls, indicators, and input/output connectors” on page 33.
14. Make sure that the bezel lock is open; then, insert the bottom bezel hooks into the bezel slots at the bottom of the BladeCenter T unit.



15. Push in the bottom and the top of the bezel assembly until they both click firmly into place; then, close the bezel locks by sliding the bottom half of the bezel-lock retention latch down until it stops.

16. If this is the only management module in the BladeCenter T unit, configure the new management module. See Chapter 4, “Configuring the management module,” on page 41 for more information. If this is the secondary management module and you followed the instructions in “Preparing for management-module redundancy” on page 12, no configuring is necessary. The secondary management module receives the configuration and status information automatically from the primary management module when necessary. However, you must apply the latest level of firmware from the IBM Support Web site to ensure smooth changeovers; for instructions, return to “Preparing for management-module redundancy” on page 12.

Note: Do not initiate any management-module changeover for approximately 2 minutes after installing the secondary management module; the secondary management module needs the time to receive initial configuration and status information.

Removing a management module

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.

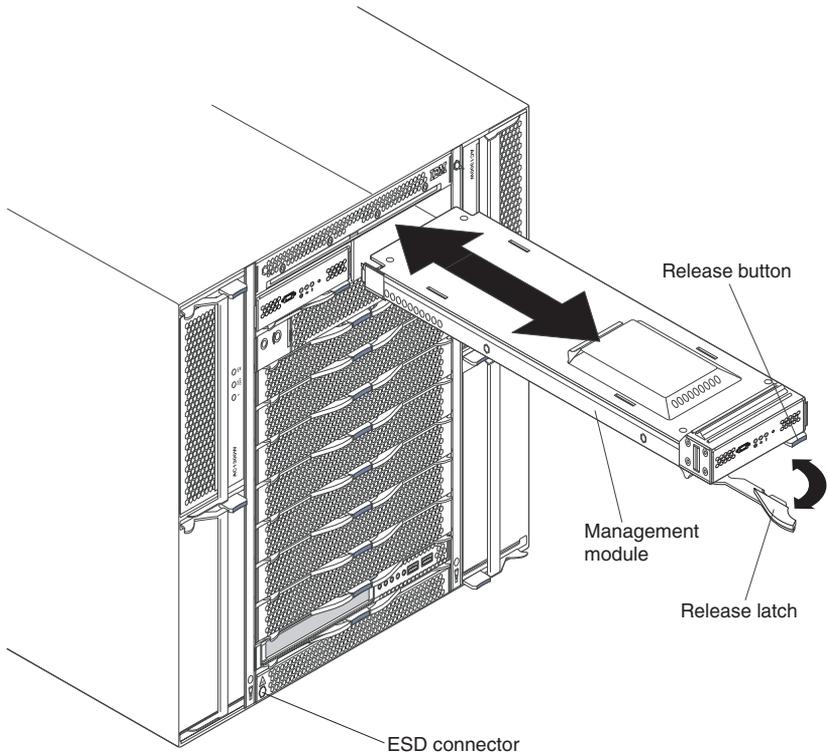
Notes:

- These instructions assume that the BladeCenter T unit is connected to power.
- If you are removing the only management module in the BladeCenter T unit, you might prefer to stop all management-module local and remote sessions before proceeding, to avoid unexpected termination of sessions.
- If you are removing the only management module in the BladeCenter T unit, be aware that as soon as you remove the module from the BladeCenter T unit, the blowers will increase to full speed.
- If you are replacing the only management module in the BladeCenter T unit and the management module is functional, you might want to save the configuration file to another medium before you proceed (under the MM Control section in the navigation pane, click **Configuration File** and follow the instructions under **Backup MM Configuration**). You will be able to restore the saved configuration file to the replacement management module (under the MM Control section in the navigation pane, click **Configuration File** and follow the instructions under **Restore MM Configuration**). See the *BladeCenter Management Module User's Guide* for more information.
- If you have just installed a second management module in the BladeCenter T unit, do not remove the first (primary) management module for approximately 2 minutes. The second (secondary) management module needs the time to receive initial configuration and status information and make sure that the firmware levels match.

Complete the following steps to remove a management module.

1. Read the safety information beginning on page v and "Installation guidelines" on page 9 through "Handling static-sensitive devices" on page 11.
2. Open the bezel locks; then, remove the bezel from the front of the BladeCenter T unit. For instructions, see step 4 on page 15 and step 5 on page 16.
3. Connect an ESD wrist strap to the ESD connector at the front of the BladeCenter T unit (see the illustration on page 11 for the location of the ESD connector) and place the wrist strap around your wrist.
4. Press the blue release button at the front of the management module.

5. Pull the release latch all the way toward the left side of the management module until it stops, as shown in the following illustration. The management module moves slightly out of the bay.



6. Slide the management module out of the bay and set it aside. Within 1 minute, place either another management module or a filler module in the bay.
7. If you placed another management module in the bay, verify that the error LED on the management module is not lit.
8. If you have not already done so, configure the replacement management module. See Chapter 4, "Configuring the management module," on page 41 for more information.

Connecting to the management module

A management-module connection is required to configure and manage operation of the BladeCenter T unit. The management module supports:

- Using the remote management and console (Ethernet) connections through the LAN module on the rear of the BladeCenter T unit
- Using a CLI-only connection through the serial port on the front of the management module

You can manage the BladeCenter T unit by using the graphical-user interface that is provided by the management module Web interface or by using the CLI that you access through Telnet, a Secure Shell (SSH) server, or the serial port.

All management-module connections to blade servers that do not support KVM functions are made using the CLI. Initial configuration of the management module can be performed after connecting it to your network; however, due to some requirements imposed by the default management-module settings, it might be easier to perform these setup operations using a temporary connection.

You can access the management-module Web interface through a network or through a computer that is connected directly to the KVM (keyboard, video, mouse) on the rear of the BladeCenter T unit. To connect to the management-module Web interface, you need the following equipment and information:

- A computer with Internet browser capability. To facilitate connections at multiple locations, you can use a notebook computer.
- The management module MAC address (listed on the label on the management module).
- For a network connection to the management module, you need the following equipment:
 - A standard Ethernet cable
 - A local Ethernet network port (facility connection)

For direct connection of a computer to the LAN module on the rear of the BladeCenter T unit for remote management and console (Ethernet) connections, you need an Ethernet standard or cross-over cable or an Ethernet switch. For an illustration that shows an example of this type of system configuration, see “Cabling the LAN module Ethernet ports” on page 24.

Connections made using the serial port can only access the CLI user-interface or the management-module CLI. For information about accessing the management-module CLI, see the *BladeCenter Management Module Command-Line Interface Reference Guide*.

For a list of supported cable and other options for the serial port on the management module, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

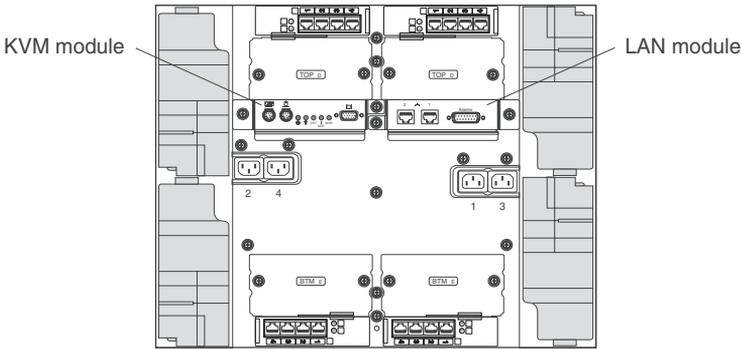
The following sections describe how to make typical network connections for a management module.

Cabling the KVM and LAN modules

The KVM (keyboard, video, mouse) module provides the electrical and mechanical interface to the BladeCenter T unit for a local keyboard, video monitor, and mouse. The KVM module also has LEDs that display BladeCenter T unit status at the rear of the BladeCenter T unit. These LEDs display the same information as the LEDs on the media tray in the front of the BladeCenter T unit.

The LAN module provides the electrical and mechanical interface to the BladeCenter T unit for the two local area network (Ethernet) connections, driven from each BladeCenter T management module, and the Telco external alarms. There is a separate dedicated LAN connector for each management module, and both must be connected to the active management network to have complete management-module redundancy. Both the KVM and LAN modules are at the rear of the BladeCenter T unit.

The BladeCenter T management module controls the KVM module and the LAN module. When two management modules are installed in the BladeCenter T unit, only one management module is active; the second management module, if present, provides redundancy. The active management module is the primary module; the redundant management module is the secondary module. If the primary management module fails or if you request a changeover through the Web interface, the secondary management module becomes active and primary and takes over the control of the KVM and LAN modules.



Cabling the KVM module ports

Connect the keyboard, video, and mouse to the appropriate connectors on the KVM module (see the “KVM (keyboard, video, mouse) module indicators and input/output connectors” on page 35 for more information). The KVM connectors are automatically connected to the primary management module.

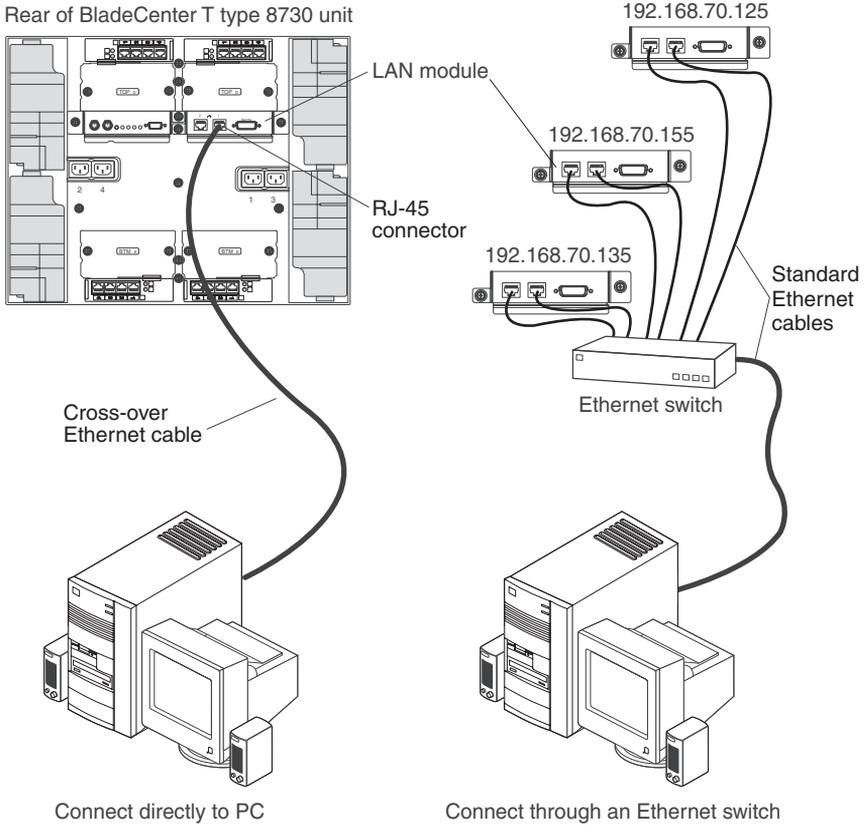
If you always use a remote session to communicate with the blade servers in the BladeCenter T unit, you do not have to connect a local keyboard, monitor, and mouse to the KVM module (see the *BladeCenter Management Module User’s Guide* for information about remote sessions).

Cabling the LAN module Ethernet ports

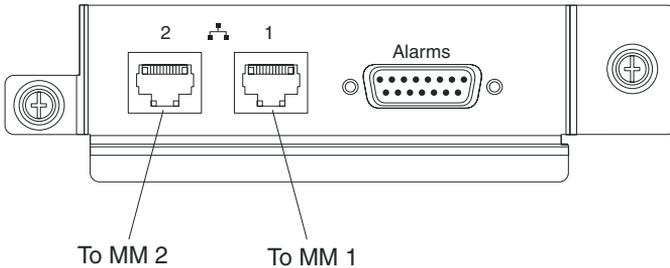
Note: To make sure that the BladeCenter T unit installation complies with electromagnetic compatibility (EMC) product regulations for intra-building lightning surges, you must use shielded LAN cables that are grounded at both ends.

You can connect directly to an Ethernet port on a personal computer (PC) using an Ethernet standard or cross-over cable, or you can make the connection through an Ethernet switch. Both connection methods are shown in the following illustration.

Note: This illustration shows an Ethernet cross-over cable that connects a computer to the LAN module on the rear of the BladeCenter T unit. However, the Advanced Management Module supports Ethernet standard cables and Ethernet cross-over cables; thus, you can use either type of cable in your system configuration.

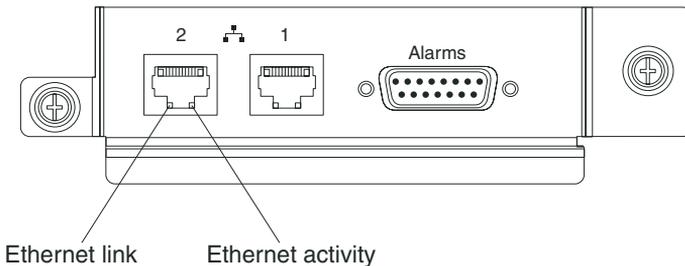


The right Ethernet port on the LAN module is driven by management module 1 (MM 1), and the left Ethernet port of the LAN module is driven by management module 2 (MM 2). By connecting both Ethernet ports (MM 1 and MM 2) to your management network, you can communicate with the new primary management module when changeover occurs.



Complete the following steps to connect the Ethernet cable to the management module.

1. Connect one end of a Category 5 or higher Ethernet cable to an Ethernet connector on the LAN module. Connect the other end of an Ethernet cable to the network.
2. Check the Ethernet LEDs to make sure that the network connection is working. The Ethernet link LED indicates that there is an active connection through the port to the network. The Ethernet activity LED indicates that there is activity through the port over the network link. The following illustration shows the locations of the Ethernet LEDs on the LAN module.



Cabling the serial port

Use the following pin-outs for the serial cable.

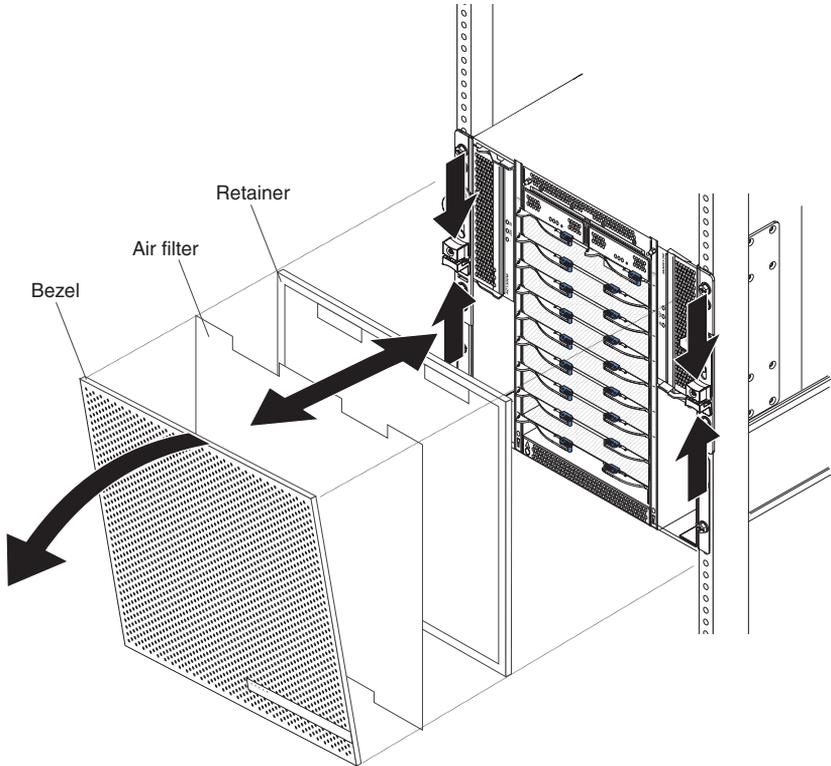
DB9 signal	DB9 pins
RxD in	2
TxD out	3
CTS in	8
RTS out	7
DSR in	6
DTR out	4
DCD in	n/a
RI in	n/a
GND	5
Note: n/a = Not applicable	

To connect the serial cable to the management module, complete the following steps:

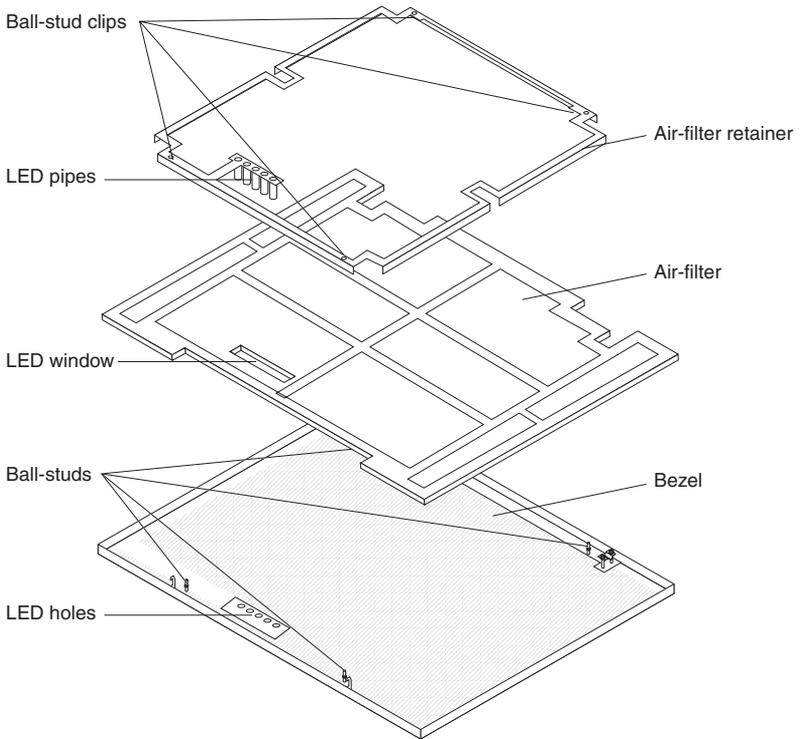
1. Read the safety information beginning on page v and “Installation guidelines” on page 9 through “Handling static-sensitive devices” on page 11.
2. Open the bezel locks; then, remove the bezel from the front of the BladeCenter T unit. For instructions, see step 4 on page 15 and step 5 on page 16.

3. Remove the air filter from the BladeCenter T unit.

Note: When the air filter is installed, it is located behind the bezel, as shown in the following illustration.



- a. Place the bezel front-side down on a work surface.
- b. Remove the air-filter retainer by pulling the retainer upwards and off the ball-stud fasteners on the bezel.



- c. Remove the air filter from the bezel frame.
 - d. Store the bezel, air filter, and air-filter retainer in a safe location for future use.
4. Connect an ESD wrist strap to the ESD connector at the front of the BladeCenter T unit (see the illustration on page 11 for the location of the ESD connector) and place the wrist strap around your wrist.
 5. Connect one end of a mini-DB-9 serial cable to the serial port on the front of the management module.
 6. Connect the other end of the serial cable to the serial port of the client computer, such as a laptop computer.
 7. Configure the serial port of the client computer to the following settings:
 - baud rate = 57600
 - parity = none
 - stop bits = 1

Important:

- When a cable is connected to the serial port, the bezel assembly and air filter will not fit on the chassis. Therefore, do not reinstall the bezel or air filter on the BladeCenter T unit.
- After the air filter is removed, the BladeCenter T unit is no longer NEBS-compliant.

Certain requirements apply when telecommunications or networking equipment is being used. For additional information about Network Equipment Building System (NEBS) requirements, see the documentation that comes with your telecommunications or networking hardware.

Connecting to the management module for the first time

The following sections describe how to connect to the management module to perform initial configuration of the BladeCenter T unit. The management module has the following default settings:

- IP address: 192.168.70.125
- Subnet: 255.255.255.0
- User ID: USERID (all capital letters)
- Password: PASSWORD (note the number zero, not the letter O, in PASSWORD)

If there is no dynamic host configuration protocol (DHCP) server on the network to which the BladeCenter T unit is connected, it takes up to 3 minutes before the management module uses the default (static) IP address. The computer that you are connecting to the management module must be configured to operate on the same subnet as the BladeCenter management module. If the IP address of the management module is outside of your local domain, you must change the IP properties on the computer that you are connecting.

There are two interfaces that you can use to connect to the management module for the first time. If you are connecting to the management module using an Ethernet connection, you can open a Web browser and use the Web-based interface or you can use the Telnet program to connect to the management module and use the CLI. If you are using a serial connection, you can use a terminal emulator to access the CLI.

Ethernet connection (Web-based)

After connecting the Ethernet cable from the management module to the client computer, complete the following steps:

1. Make sure that the subnet of the client computer is set to the same value as the default management module subnet (255.255.255.0).

2. Open a Web browser on the client computer, and direct it to the default management-module IP address (192.168.70.125).
3. Enter the default user name, `USERID`, and the default password, `PASSWORD` (note the number zero, not the letter O, in `PASSWORD`), to start the remote session.
4. Follow the instructions on the screen. Make sure that you set the timeout value that you want for your Web session.

After connecting to the management module for the first time, perform initial configuration of the BladeCenter T unit. See the *BladeCenter Management Module User's Guide* for configuration instructions.

Ethernet connection (CLI)

After connecting the Ethernet cable from the management module to the client computer, complete the following steps:

1. Make sure that the subnet of the client computer is set to the same value as the default management module subnet (255.255.255.0).
2. Open a console window and login to the default management module, IP address, (192.168.70.125).
3. Enter the default user name, `USERID`, and the default password, `PASSWORD` (note the number zero, not the letter O, in `PASSWORD`), to start the remote session.

Serial connection (CLI)

After connecting the serial cable from the management module to the client computer, complete the following steps:

1. Make sure that the serial port of the client computer is set to the following settings:
 - baud rate = 57600
 - parity = none
 - stop bits = 1
2. Open a terminal emulator window and connect to the serial port that is cabled to the management module.
3. Enter the default user name, `USERID`, and the default password, `PASSWORD` (note the number zero, not the letter O, in `PASSWORD`), to start the remote session.

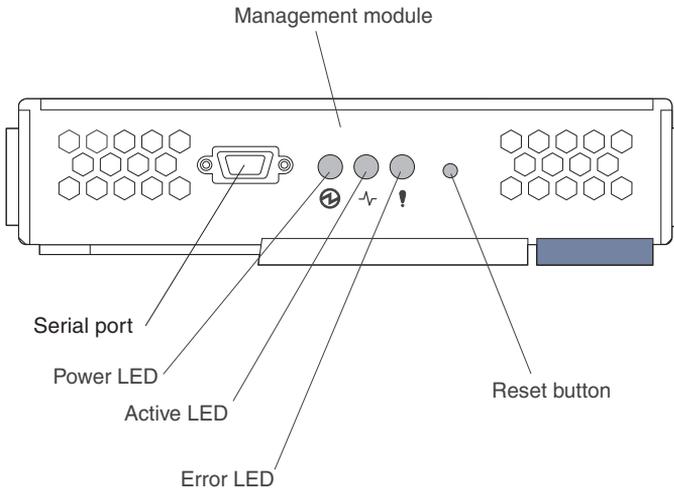
After connecting to the management module for the first time, perform initial configuration of the BladeCenter T unit. See the *BladeCenter Management Module User's Guide* for graphical interface configuration instructions or the *BladeCenter Management Module Command-Line Interface Reference Guide* for CLI configuration instructions.

Chapter 3. Management, KVM, and LAN module LEDs and external ports

This chapter describes the LEDs and controls on the BladeCenter T management modules, KVM module, and LAN module. This chapter also identifies the external ports on the BladeCenter T management modules and on the KVM and LAN modules.

Management module controls, indicators, and input/output connectors

These management-module controls and indicators provide status information about the management module and remote management connection. For additional information, see the *Problem Determination and Service Guide* or *Hardware Maintenance Manual and Troubleshooting Guide* on the IBM BladeCenter T Advanced Management Module Documentation CD.



Management-module LEDs: These LEDs provide status information about the management module and remote management connection.

- **Power:** When this green LED is lit, it indicates that the management module has power.
- **Active:** When this green LED is lit, it indicates that the management module is actively controlling the BladeCenter T unit. Only one management module actively controls the BladeCenter T unit. If two management modules are installed in the BladeCenter T unit, this LED is lit on only one.

- **Error:** When this amber LED is lit, it indicates that an error has been detected somewhere on the management module. When this LED is lit, the system-error LED (critical, major, or minor) on each of the BladeCenter T system-status panels is also lit.

Reset button: To restart the management module, press this recessed button for less than 5 seconds.

To erase all of the stored configuration values, press the reset button for more than 5 seconds. The management module automatically restarts after you perform this action. *Do not* perform this action unless you intend to:

- Erase your passwords and the configured IP addresses for the management module
- Lose connection with the remote-management station, the I/O modules, and the blade servers
- Reset the IP configuration of the management-module network interfaces (Ethernet 1, Ethernet 2, gateway address, and so on) to the factory defaults

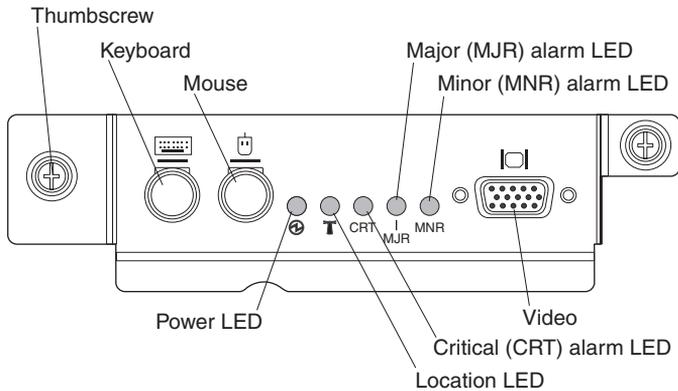
If you press the reset button for more than 5 seconds, you will have to create new passwords and reconfigure the management-module settings. For instructions, see the information beginning with Chapter 4, “Configuring the management module,” on page 41.

Use a straightened paper clip to press this button.

Serial port: Use this connection for configuring and managing the BladeCenter components over a serial line through the CLI user-interface or the management-module CLI. This port provides access and redirection to the SOL interface of any processor blade server. For example, you can connect a laptop device to the serial port and use a terminal-emulator program to configure the assorted IP addresses, user accounts, and other management settings through the CLI user-interface or the management-module CLI. For a list of supported options for the serial port on the management module, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>. For information about accessing the management-module CLI, see the *BladeCenter Management Module Command-Line Interface Reference Guide*.

KVM (keyboard, video, mouse) module indicators and input/output connectors

The KVM module is a hot-swap module that is installed on the rear of the BladeCenter T unit and is held in place by captive thumbscrews. This module contains two PS/2-style connectors for the keyboard and mouse, a system-status panel, and an HD-15 video connector.



System-status LEDs: These LEDs provide status information for the BladeCenter T unit.

- **Power:** When continuously lit, this green LED indicates the presence of power in the BladeCenter T unit. The LED turns off when the power source is interrupted.
Attention: If the power LED is off, it does not mean electrical power is not present in the BladeCenter T unit. The LED circuitry might be faulty. To remove all electrical power from the BladeCenter T unit, you must disconnect all power cords from all power modules.
- **Location:** This blue LED is for system identification. A system administrator or servicer uses this LED to locate a specific BladeCenter T unit for service or repair. You can turn on, turn off, or flash the location LED through the Web interface or a remote management console.

Alarm LEDs: These LEDs provide alarm notifications for the BladeCenter T unit.

- **CRT (Critical alarm, amber or red):** When continuously lit, this LED indicates the presence of a critical system fault. The system is configured with amber as the default. See the *BladeCenter Management Module User's Guide* for information about setting the color of this LED.

A critical system fault is an error or event that is unrecoverable or that results in a loss of redundancy. In these cases, the system might not continue to operate. An example is the loss of a redundant power supply.

- **MJR (Major alarm, amber or red):** When continuously lit, this LED indicates the presence of a major system fault. The system comes with amber as the default. See the *BladeCenter Management Module User's Guide* for information about setting the color of this LED.

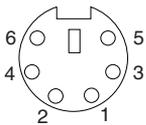
A major system fault is an error or event that has a detectable impact to system operation. In this case, the system can continue to operate but with reduced performance. An example is the loss of one of two mirrored disks.

- **MNR (Minor alarm, amber):** When continuously lit, this LED indicates the presence of a minor system fault. A minor system fault is an error or event that has little impact to system operation. An example is a correctable error correcting code (ECC) error.

Connectors: The KVM module has the following I/O connectors. Only one blade server at a time can be connected to the KVM connectors. The blade server that is connected to the KVM connectors is the same blade server that is connected to the management-module remote-console interface.

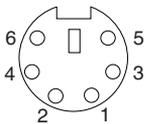
- **Keyboard connector:** The BladeCenter T KVM module contains one PS/2-style keyboard connector.

Use this connector to connect a PS/2 keyboard to the BladeCenter T unit.



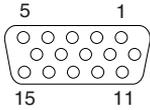
- **Mouse connector:** The BladeCenter T KVM module contains one PS/2-style mouse connector.

Use this connector to connect a PS/2 mouse to the BladeCenter T unit.



- **Video connector:** The BladeCenter T KVM module contains one standard video connector. The integrated video controller on each blade server is compatible with super video graphics array (SVGA) and VGA devices and communicates through this video port.

Use this connector to connect a video monitor to the BladeCenter T unit.



Notes:

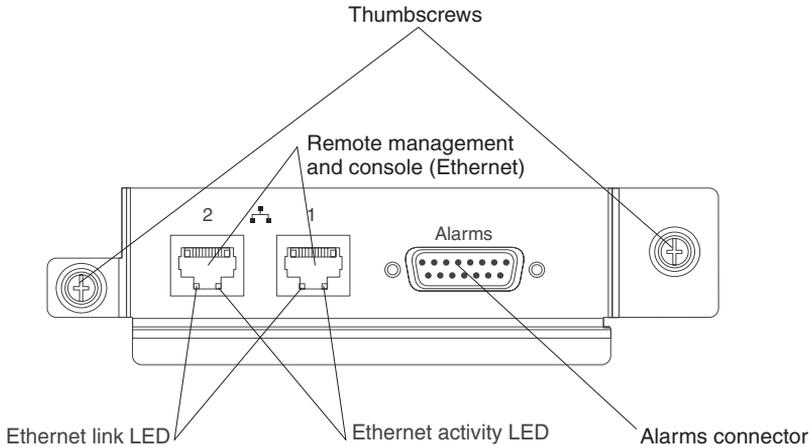
- Table 1 lists the only blade server specified video resolution and refresh rate combinations, for KVM equipped blade servers, that are supported for all system configurations. Unless noted otherwise, these settings apply to all management module types.
- The Web interface does not support the double-byte character set (DBCS) languages.

Table 1. Video resolutions and refresh rates

Resolution	Refresh rate
640x480	60 Hz
640x480	72 Hz
640x480	75 Hz
640x480	85 Hz
800x600	60 Hz
800x600	72 Hz
800x600	75 Hz
800x600	85 Hz
1024x768 (Advanced Management Module only)	70 Hz
1024x768	60 Hz
1024x768	75 Hz

LAN-module indicators and input/output connectors

The LAN module is a hot-swap module that is installed on the rear of the BladeCenter T unit and is held in place by captive thumbscrews. The LAN module provides the electrical and mechanical interface to the BladeCenter T unit for the two local area network (Ethernet) connections, as driven from each management module, and the Telco external alarms. This module contains two RJ-45 connectors with LEDs and one DB-15P (male) Telco alarm connector.



LAN-module LEDs: These LEDs provide status information about the LAN connection:

- **Ethernet link:** When this green LED is lit, there is an active connection through the port to the network.
- **Ethernet activity:** When this green LED is flashing, it indicates that there is activity through the port over the network link.

LAN-module connectors:

- **Remote management and console (Ethernet) connectors:** The LAN module provides two Ethernet RJ-45 connectors.

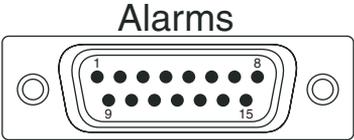
The BladeCenter T LAN module contains two 10/100 Mb Ethernet connectors that provide the remote connections, driven from each management module, to the network management station on the network.

Use these ports for remote management and remote console.

The network management station, through these connectors, can access control functions running in the management module, the service processor on each blade server, or within each I/O module. However, it cannot use these ports to communicate with application programs running in the blade

servers. The network management station must direct those communications through a network connected to the external ports in the I/O modules in the BladeCenter T unit.

- **Alarms connector:** The LAN module provides one Telco DB-15P (male) alarms connector for critical, major, and minor Telco alarms. Each of the alarms has a relay that enables multiple system alarm indicators to be daisy-chained together. Table 2 shows the pinouts for the Telco alarms connector.



Note: The external alarm reset inputs (major and minor) reset the alarm relays in the BladeCenter T unit, but do not reset the alarm condition of the BladeCenter T unit. Alarm conditions within the BladeCenter T unit must be reset through the management-module Web interface or command-line interface.

Table 2. Telco alarms connector pinout

Pin #	Description	I/O
1	Minor alarm reset +	I
2	Minor alarm reset -	I
3	Major alarm reset +	I
4	Major alarm reset -	I
5	Critical alarm normally open	O
6	Critical alarm normally closed	O
7	Critical alarm common	O
8	Minor alarm normally open	O
9	Minor alarm normally closed	O
10	Minor alarm common	O
11	Major alarm normally open	O
12	Major alarm normally closed	O
13	Major alarm common	O
14	Reserved	
15	Reserved	

The electrical specifications for the alarms connector are as follows:

– **Outputs**

- Voltage range: 0 V dc to -100 V dc (maximum current 0.3 A at 100 V dc)
- Current range: 0 A to 1 A (maximum voltage 30 V dc at 1 A)
- Worst-case VA: 1 A at -30 V dc (30 VA maximum) indefinitely

– **Inputs**

- Voltage range: 0 V dc to -100 V dc (including transients)
- Differential input voltage: 3 V dc to 72 V dc

– **Reset input activation**

Pulse width: 200 ms (minimum) to 300 ms

Chapter 4. Configuring the management module

The BladeCenter T unit automatically detects the modules and blade servers that are installed and reads their vital product data (VPD). When the BladeCenter T unit is started, the management module automatically configures the remote management port on the management module, accessed through the LAN module on the rear of the BladeCenter T unit, so that you can configure and manage the BladeCenter T unit and blade servers.

You can configure and manage BladeCenter T components from a remote location using the management-module Web-based interface or the management-module CLI. You can also configure and manage BladeCenter T components through the local management-module serial port using the CLI.

After the management module is installed, you initially configure the following settings:

- Set up a remote connection and remote access or a local connection
- Configure the management-module Ethernet port connection
- Configure the network interface ports

You also can use the management-module Web interface or management-module CLI to view some of the blade server configuration settings. All management modules are preconfigured with the same static Internet protocol (IP) address. You can assign a new static IP address for each BladeCenter T unit. If dynamic host configuration protocol (DHCP) is not used and you do not assign a new static IP address for each BladeCenter T unit before attempting to communicate with a management-module interface, only one BladeCenter T unit at a time can be added onto the network for discovery. Adding multiple units to the network without a unique IP address assignment for each BladeCenter T unit results in IP address conflicts.

Establishing and configuring a remote Ethernet-port connection

After you connect the active management module to the network, the Ethernet-port connection is configured in one of the following ways:

- If you have an accessible, active, and configured DHCP server on the network, the host name, IP address, gateway address, subnet mask, and Dynamic Name Server (DNS) server IP address are set automatically.
- If the DHCP server does not respond within 3 minutes after the port is connected, the management module uses the factory-defined static IP address and default subnet address.

Either of these actions enables the Ethernet connection on the active management module.

The management module supports the following Web browsers for remote (client) access. The client Web browser that you use must be Java™-enabled, must support JavaScript™ 1.2 or later, and must have the Java Virtual Machine (JVM) 1.4.1 or later Plug-in installed. The JVM Plug-in is available at the Java Web site at <http://www.java.com/>.

- Microsoft Internet Explorer 5.5, or later (with latest Service Pack installed)
- Netscape Navigator 7.0, or later
- Mozilla version 1.3, or later

The following server operating systems have USB support, which is required for the Remote Control feature.

- Microsoft Windows Server 2003
- Microsoft Windows 2000 with Service Pack 4 or later
- Red Hat Linux version 7.3
- SUSE LINUX version 8.0
- Novell NetWare 6.5

Note: The Remote Disk feature works with only the Microsoft Windows 2000 operating system.

To use the Remote Control feature, the client system must also have an Intel Pentium® III or later microprocessor operating at 700 MHz or faster (or an equivalent microprocessor).

The management-module Web interface does not support the double-byte character set (DBCS) languages.

To configure for remote access, complete the following steps:

1. Make sure that your computer is on the same subnet as the management module; then, use a Web browser to connect to the management module.
2. In the browser **Address** field, specify the IP address the management module is using:
 - If the IP address was assigned through a DHCP server, get the IP address from your network administrator.
 - The factory-defined static IP address is 192.168.70.125, the default subnet address is 255.255.255.0, the default host name is MMxxxxxxxxxxx, where xxxxxxxx is the burned-in media access control (MAC) address. The MAC address is on a label on the management module, below the reset button.

Note: If the IP configuration is assigned by the DHCP server, the network administrator can use the MAC address of the management-module network interface to find out what IP address and host name are assigned.

See the *BladeCenter Management Module User's Guide* for more instructions for configuring the management module.

Communicating with the IBM Director software

The IBM Director program communicates with the BladeCenter T unit through the Ethernet port on the active management module.

To communicate with the BladeCenter T unit, the IBM Director software needs a managed object (in the Group Contents pane of the IBM Director Management Console main window) that represents the BladeCenter T unit. If the management module IP address is known, the network administrator can create an IBM Director managed object for the unit. If the IP address is not known, the IBM Director software can automatically discover the BladeCenter T unit (out-of-band, using the Ethernet port on the management module) and create a managed object for the unit.

For the IBM Director software to discover the BladeCenter T unit, your network must initially provide connectivity from the IBM Director server to the management-module Ethernet port. To establish connectivity, the management module attempts to use DHCP to acquire its initial IP address for the Ethernet port. If the DHCP request fails, the management module uses the static IP address assigned to it. Therefore, the DHCP server (if used) must be on the management LAN for your BladeCenter T unit.

Note: For I/O module communication with the IBM Director server through the management-module external Ethernet port, the I/O module internal network interface and the management-module external interfaces must be on the same subnet.

If you do not want to keep the factory-defined static values, you can configure the static IP address, host name, and subnet mask for the management module through the Web-based interface.

Starting the management and configuration program

Complete the following steps to start the management and configuration program:

1. Open a Web browser. In the address or uniform resource locator (URL) field, type the IP address or host name defined for the management-module remote connection. (Your computer must be on the same subnet as the management module.)

The Enter Network Password window opens.

2. Type your user name and password. If you are logging in to the management module for the first time, you can obtain your user name and password from your system administrator. All login attempts are documented in the event log.

Note: The initial user ID and password for the management module are:

- User ID: USERID (all capital letters)
- Password: PASSWORD (note the zero, not O, in PASSWORD)

3. Follow the instructions that appear on the screen. Be sure to set the timeout value that you want for your Web session.

The BladeCenter T management and configuration window opens.

BladeCenter T Management Module

System Status Summary

System is operating normally. All monitored parameters are OK.

The following links can be used to view the status of different components.

- [Blade Servers](#)
- [I/O Modules](#)
- [Management Modules](#)
- [Power Modules](#)
- [Blowers](#)
- [Front Panel](#)

Blade Servers

Click the icon in the Status column to view detailed information about each blade server.

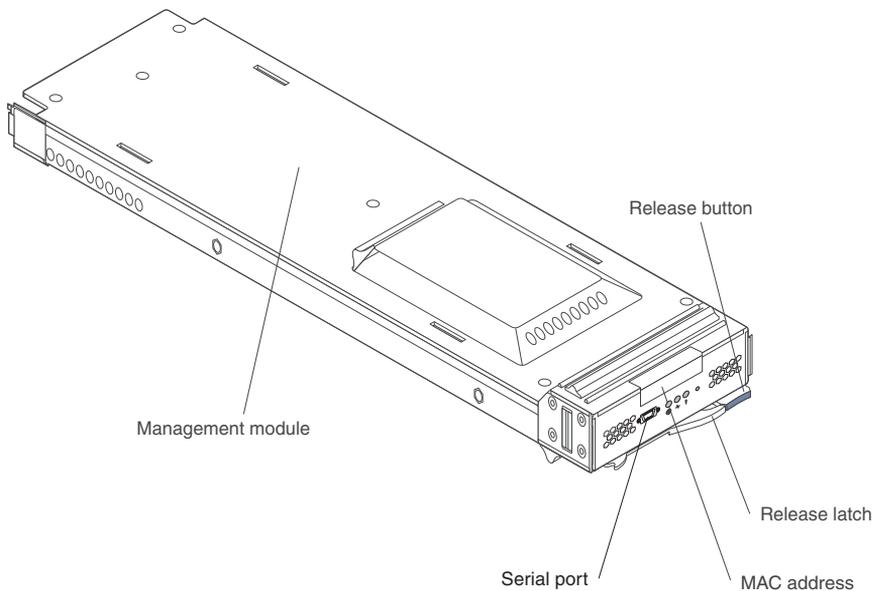
Bay	Status	Name	Pwr	Owner**		Network		WOL*	Local Control			BEM*
				KVM	MT*	Onboard	Card		Pwr	KVM	MT*	
1		No blade present										
2		No blade present										
3		No blade present										
4		No blade present										
5	●	SN#ZJ1XXV4B510N	On			Eth	--- --- ---	On	X	X	X	
6		No blade present										
7	●	BLADE#07	On		X	Eth	--- --- ---	On	X	X	X	
8	●	SN#ZJ1WLW47T15P	On	X		Eth	--- --- ---	On	X	X	X	

The navigation pane (on the left side of the management-module window) contains navigational links that you use to manage your BladeCenter T unit and check the status of the components (modules and blade servers).

Configuring the management module

Use your Web browser to connect to the management module (see the *BladeCenter Management Module User's Guide* for information). In the browser **Address** field, specify the IP address the management module is using:

- If the IP address was assigned through a DHCP server, get the IP address from your network administrator.
- The factory-defined static IP address is 192.168.70.125, the default subnet address is 255.255.255.0, and the default host name is MMxxxxxxxxxxx, where xxxxxxxxxxxx is the burned-in medium access control (MAC) address. The MAC address is on a label on the front of the management module, above the LEDs, as shown in the following illustration.



Note: If the IP configuration is assigned by the DHCP server, the network administrator can use the MAC address of the management-module network interface to find out what IP address and host name are assigned.

Important: You configure only the primary (active) management module. The secondary management module receives the configuration and

status information automatically from the primary management module when necessary. The configuration information in this chapter applies to the primary management module, which might be the only management module installed in the BladeCenter T unit.

If the management module that you installed is a replacement for the only management module in the BladeCenter T unit, and you saved the configuration file before replacing the management module, you can restore the saved configuration file to the replacement management module using the management-module Web interface. See the *BladeCenter Management Module User's Guide* for information about saving and restoring configuration files.

Note: There are two ways to configure the I/O modules; through the management-module Web interface, or through an external I/O-module port enabled through the management module, using a Telnet interface or a Web browser. See the documentation that comes with the I/O module for more information.

For the active management module to communicate with the I/O modules in the BladeCenter T unit, you must configure the IP addresses for the following external ports:

- The external Ethernet (remote management) port on the management module, accessed through the LAN module on the rear of the BladeCenter T unit (see the *BladeCenter Management Module User's Guide* for information). The initial management-module autoconfiguration enables the network management station to connect to the management module to configure the port completely and to configure the rest of the BladeCenter T unit.
- The management port on each I/O module provides for communication with the management module. You configure this port by configuring the IP address for the I/O module (see the *BladeCenter Management Module User's Guide* for information).

Note: Some types of I/O modules, such as the pass-thru module, have no management port.

See the documentation that comes with the I/O module to determine what else you must configure in the I/O module.

To communicate with the blade servers for functions such as deploying an operating system or application program over the external network, you must also configure at least one external (in-band) port on an Ethernet I/O module in I/O-module bay 1 or 2. See the *Installation and User's Guide* for your BladeCenter T unit for general information about configuring the external ports on Ethernet I/O modules.

The Web-based user interface communicates with the management and configuration program that is part of the firmware that comes with the management module. You can use this program to perform the following tasks:

- Defining the login IDs and passwords.
- Selecting recipients for alert notification of specific events.
- Monitoring the status of the BladeCenter T unit and blade servers.
- Controlling the BladeCenter T unit and blade servers.
- Accessing the I/O modules to configure them.
- Changing the startup sequence in a blade server.
- Setting the date and time.
- Using a remote console for the blade servers.
- Changing ownership of the keyboard, video, and mouse.
- Changing ownership of the optical drive and USB ports. (The optical drive in the BladeCenter T unit is viewed as a USB device by the blade server operating system.)
- Activating On Demand blade servers.
- Setting the active color of the critical (CRT) and major (MJR) alarm LEDs

See the *BladeCenter Management Module User's Guide* for detailed instructions for using the management and configuration program for the active management module and configuring external ports on Ethernet I/O modules. You also can use the management and configuration program to view some of the blade server configuration settings.

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 appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your BladeCenter or optional device, 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.
- Go to <http://www.ibm.com/bladecenter/> and click **Support** to check for information to help you solve the problem.

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 BladeCenter systems also describes the diagnostic tests that you can perform. Most BladeCenter 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 software.

Using the documentation

Information about your IBM BladeCenter 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/bladecenter/>, click **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 BladeCenter systems, optional devices, services, and support at <http://www.ibm.com/bladecenter/>. For service information, click **Support**.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with BladeCenter products. 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. Go to <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.

Appendix B. 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 - IBM BladeCenter T Advanced Management Module

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.

Austria -- +43-1-24592-5901	Latvia -- +386-61-1796-699
Belgium -- +32-70-23-3392	Lithuania -- +386-61-1796-699
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
Estonia -- +386-61-1796-699	Poland -- +48-22-878-6999
Finland -- +358-8001-4260	Portugal -- +351-21-892-7147
France -- +33-238-557-450	Slovakia -- +421-2-4954-1217
Germany -- +49-1805-253553	Slovenia -- +386-1-4796-699
Greece -- +30-210-680-1700	Spain -- +34-91-714-7983
Hungary -- +36-1-382-5720	Sweden -- +46-8-477-4420
Ireland -- +353-1-815-4000	United Kingdom -- +44-1475-555-055
Italy -- +39-800-820-094	

Appendix C. Notices

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

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

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Chipkill	ServeRAID	XA-64
e-business logo	ServerGuide	X-Architecture
@server	ServerProven	XpandOnDemand
FlashCopy	TechConnect	xSeries
IBM		

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Important notes

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

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

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.

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

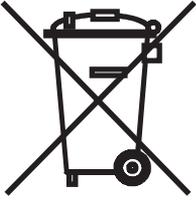
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IBM makes no representations or warranties with respect to non-IBM products. Support (if any) for the non-IBM products is provided by the third party, not IBM.

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

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.



Notice: This mark applies only to countries within the European Union (EU) and Norway.

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

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.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies.



For Taiwan: Please recycle batteries.



Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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

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

Industry Canada Class A emission compliance statement

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

Avis de conformité à la réglementation d'Industrie Canada

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

Australia and New Zealand Class A statement

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

United Kingdom telecommunications safety requirement

Notice to Customers

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

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

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.

Taiwanese Class A warning statement

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

Chinese Class A warning statement

声 明

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

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Index

A

- active LED 33
- active management module 6, 14, 23
- air filter, removing 28
- alarm LEDs 35
- alarms connector, Telco 38, 39
- amber LEDs 34, 35, 36
- attention notices 5
- Australia and New Zealand Class A statement 80

B

- batteries, disposal 79
- bezel assembly
 - installing 18
 - removing 15
- bezel locks 15, 18
- BladeCenter
 - documentation CD 3
 - Web site 3, 49, 50
- BladeCenter T unit
 - alarm notifications for 35
 - configuring 41
 - documentation 3
 - handling static-sensitive devices 11
 - locating for service or repair 35
 - management-module bay locations 9
 - status information 35
 - system reliability 10
- blue LED 35

C

- cabling
 - keyboard, video, and mouse (KVM) module ports 23, 24
 - local area network (LAN) module
 - Ethernet ports 23, 24
 - remote connection to Ethernet
 - port 26
 - serial port 27
- caution statements 5
- changeover from secondary to primary management module 12, 19, 23

- Chinese Class A warning statement 82
- Class A electronic emission notice 80
- color on components
 - blue 10
 - orange 10
- color on LEDs
 - amber 34, 35, 36
 - blue 35
 - green 33, 35, 38
 - red 35, 36
- compatible options Web site 10
- configuration
 - Internet protocol (IP) addresses 46
 - management module 41
- configuring
 - Ethernet port 41
 - management module 41
 - remote access 41
- connecting to the management module
 - initial settings 30
 - requirements 22
- connector
 - electrostatic discharge (ESD) 11, 12, 17
 - Ethernet 38, 41
 - input/output 38
 - keyboard 36
 - KVM module 36
 - LAN module 38
 - PS/2 mouse 36
 - remote management and console 38
 - serial 6, 33, 34
 - Telco alarms 38, 39
 - video 37
- controls and indicators, management module 33
- critical Telco alarm LED 35

D

- danger statements 5
- default settings, management module 30
- default values 34
- disposal of batteries 79

- documentation
 - notices 5
 - ordering 50
 - related 2
- documentation CD
 - starting 4
 - using 4
- downloading management-module firmware 13

E

- electronic emission Class A notice 80
- electrostatic discharge (ESD)
 - connector 11, 12, 17
 - wrist strap 11, 17, 20
- error LED 34
- Ethernet
 - configuring remote connection 41
 - connectors for remote management and console 38
 - Ethernet activity LED 38
 - Ethernet link LED 38
 - port connection for remote access 41
 - ports
 - cabling 26
 - location 24
 - switch 24
- European Union EMC Directive conformance statement 81

F

- FCC Class A notice 80
- firmware 12
- firmware update 13
- first-time connection to the management module 30

G

- getting help and information 49
- green LEDs 33, 35, 38

H

- handling static-sensitive devices 11
- hardware service and support 50
- help and information 49
- hot-swap components 10

I

- I/O module, definition 7
- IBM Director communications, description 43
- IBM Web site for warranty, multilingual 73
- identification labels 6
- important notices 5
- Industry Canada Class A emission compliance statement 80
- initial connection to the management module 30
- installation
 - guidelines 9, 10
 - illustration 17
 - procedure 14
- installing
 - bezel assembly 18
 - management module 14
 - options 9
- Internet protocol (IP) address
 - configuring 46
 - factory-defined 45
 - resetting 34
- introduction 1

J

- Japanese Voluntary Control Council for Interference (VCCI) statement 82

K

- keyboard connector 36
- KVM module
 - cabling 23
 - connectors
 - keyboard 36
 - mouse 36
 - video 36
 - function 23
 - LEDs
 - critical Telco alarm 35
 - location 35
 - major Telco alarm 35
 - minor Telco alarm 35
 - power 35
 - location 24

L

- labels 6
- LAN module
 - cabling 23
 - Ethernet ports 24
 - function 23, 38
 - LEDs
 - Ethernet activity 38
 - Ethernet link 38
 - location 24
- LEDs
 - alarm
 - critical 35
 - major 36
 - minor 36
 - KVM module
 - critical alarm 35
 - location 35
 - major alarm 36
 - minor alarm 36
 - power 35
 - LAN module
 - Ethernet activity 38
 - Ethernet link 38
 - management module
 - active 33
 - error 34
 - power 33
 - system identification 35
- locating the BladeCenter T unit for service or repair 35
- location
 - connectors on KVM module 35
 - connectors on LAN module 38
 - KVM module 24
 - LAN module 24
 - LEDs on KVM module 35
 - LEDs on LAN module 38
 - management-module bays 9
 - media access control (MAC) address 6
 - serial number 6
 - serial port on management module 6, 33
 - system-status panel 35

M

- major Telco alarm LED 35
- management module
 - active 6, 14, 23

- management module (*continued*)
 - bay locations 9
 - communication 7
 - configuring 41
 - connection requirements 22
 - controls 33
 - firmware 12
 - firmware update 13
 - functions 7
 - illustration 6
 - initial connection 30
 - installing 14
 - LEDs
 - active 33
 - error 34
 - power 33
 - overview 6
 - primary 6, 12, 23
 - redundancy 6, 12, 23
 - remote management connectors 38
 - removing 20
 - reset button 34
 - secondary 6, 12, 23
 - serial port 33, 34
- media access control (MAC) address 2, 6
- minor Telco alarm LED 35
- mouse connector 36
- multilingual Web site for IBM warranty 73

N

- notes, important 77
- notices
 - Australia and New Zealand Class A statement 80
 - battery return program 79
 - Chinese Class A warning statement 82
 - electronic emission 80
 - European Union EMC Directive conformance statement 81
 - FCC, Class A 80
 - Industry Canada Class A emission compliance statement 80
 - Japanese Voluntary Control Council for Interference (VCCI) statement 82
 - product recycling 78

notices (*continued*)
 Taiwanese Class A warning
 statement 81
 trademarks 76
 United Kingdom telecommunications
 safety requirement 81
notices and statements 5

O

options
 installing 9
 Web site 10
ordering publications 50
overview
 configuration 41
 documentation library 2
 installation 9
 management module 6
 safety information vi

P

pin-out values
 serial port 27
 Telco alarms connector 39
port
 See connector
power LED
 KVM module 35
 management module 33
preparing management modules for
 redundancy 12
primary management module 6, 12, 23
product information 2
product recycling 78
publications
 ordering 50
 related 2

R

recording product information 2
recycling 78
red LEDs 35, 36
redundancy 6, 12, 23
refresh rates, video 37
related documentation 2
remote access, configuring 41
remote connection to Ethernet port,
 cabling 26

remote management connectors 38
removing
 air filter 28
 bezel assembly 15
 management module 20
reset button, management module 34
resolutions, video 37

S

safety information
 document 2
 handling static-sensitive devices 11
 overview vi
 statements vii
secondary management module 6, 12,
 23
serial number 6
serial port 6, 33, 34
service for IBM products 50
software service and support 50
starting the documentation CD 4
statements and notices 5
static electricity 11
static-sensitive devices, handling 11
support for BladeCenter products 49
support telephone numbers
 European Union (EU) 73
 United States of America and
 Canada 50, 73
 Web site, international 50
supported video resolutions 37
switch, Ethernet 24
system identification LED 35
system reliability 10
system-status panel, KVM module 35

T

Taiwanese Class A warning
 statement 81
technical assistance 49
Telco
 alarm LEDs 35
 alarms connector 39
telephone numbers, support
 European Union (EU) 73
 United States of America and
 Canada 50, 73
 Web site, international 50
touch points 10

trademarks 76

U

United Kingdom telecommunications
safety requirement 81
United States electronic emission Class A
notice 80
United States FCC Class A notice 80
updating management-module
firmware 13
using the documentation CD 4

V

video connector 37
video refresh rates 37
video resolutions 37

W

warranty information
general 51
multilingual IBM Web site 73
product-specific 71
telephone numbers
European Union (EU) 73
United States of America and
Canada 73
Web browsers, supported 42
Web site
BladeCenter Planning and Installation
Guide 3
compatible options (ServerProven
list) 10
disposal of batteries 79
hardware service and support 50
IBM BladeCenter products 3, 49, 50
IBM products 1
IBM support 2, 13
IBM warranty, multilingual 73
ordering publications 50
product recycling 78
software service and support 50
telephone numbers, worldwide
support 50
Web-based user interface 41, 47
worldwide support, telephone numbers
European Union (EU) 73
United States of America and
Canada 50, 73

worldwide support, telephone numbers
(*continued*)

Web site, international 50
wrist strap, electrostatic discharge
(ESD) 11, 17, 20



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