

BladeCenter HT Type 8740 and 8750



# Installation and User's Guide



BladeCenter HT Type 8740 and 8750



# Installation and User's Guide

**Note:**

Before using this information and the product it supports, read the general information in Appendix B, "Getting help and technical assistance," on page 81 and Appendix C, "Notices," on page 85.

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## Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

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

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

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

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

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

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες 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.

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

بۇ ئۈنۈننى كۈرۈشكەن ئالدىنقىدا بىخەتەرلىك باياناتىنى ئوقۇڭ.

ཐོན་རྒྱུ་འདི་བདེ་སྐྱོད་མ་བྱས་གོང་། རྫོང་གི་ཡིད་གཟབ་  
བྱ་འདྲ་མིན་ཡོད་པའི་འོད་སྟེར་བལྟ་དགོས།

مەزكۇر مەھسۇلاتنى ئورنىتىشتىن بۇرۇن بىخەتەرلىك ئۇچۇرلىرىنى ئوقۇپ چىقىڭ.

Youq mwngz yungh canjbinj neix gaxgonq, itdingh aeu doeg aen  
canjbinj soengq cungj vahgangj ancien siusik.

**Important:**

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

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

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

**Statement 2:**



**CAUTION:**

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

*Do not:*

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

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

**Statement 3:**



**CAUTION:**

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

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



**DANGER**

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

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

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

**Statement 8:**



**CAUTION:**

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



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

**Statement 12:**



**CAUTION:**

The following label indicates a hot surface nearby.



**Statement 13:**



**DANGER**

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

**Statement 21:**



**CAUTION:**

Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

**Statement 29:**



**CAUTION:**

This equipment is designed to permit the connection of the earthed conductor of the dc supply circuit to the earthing conductor at the equipment. If this connection is made, all of the following conditions must be met:

- This equipment shall be connected directly to the dc supply system earthing electrode conductor or to a bonding jumper from an earthing terminal bar or bus to which the dc supply system earthing electrode conductor is connected.
- This equipment shall be located in the same immediate area (such as, adjacent cabinets) as any other equipment that has a connection between the earthed conductor of the same dc supply circuit and the earthing conductor, and also the point of earthing of the dc system. The dc system shall not be earthed elsewhere.
- The dc supply source shall be located within the same premises as this equipment.
- Switching or disconnecting devices shall not be in the earthed circuit conductor between the dc source and the point of connection of the earthing electrode conductor.

Statement 31:



**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 power source.**
- **Connect to properly wired power sources 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 ac power cords, dc power sources, network connections, telecommunications systems, and serial cables 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 OFF all power sources and equipment to be attached to this product.
2. Attach all cables to the devices.
3. Attach signal cables to the connectors.
4. Attach power cords to power sources. For dc systems, ensure correct polarity of -48VDC connections: RTN is (+) and -48VDC is (-). Earth ground should use a two-hole lug for safety.
5. Turn ON all the power sources.

**To Disconnect:**

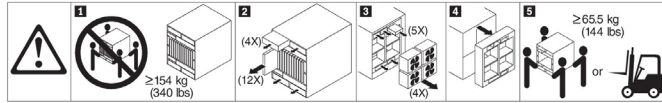
1. Turn OFF all power sources and equipment to be attached to this product.
  - For ac systems, remove all power cords from the chassis power receptables or interrupt power at the ac power distribution unit.
  - For dc systems, disconnect dc power sources at the breaker panel or by turning off the power source, then remove the dc cables.
2. Remove the signal cables from the connectors.
3. Remove all cables from the devices.

Statement 32:



**CAUTION:**

To avoid personal injury, before lifting the unit, remove all the blades, power supplies, and removable modules to reduce the weight.



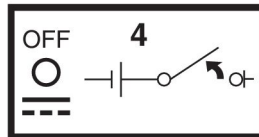
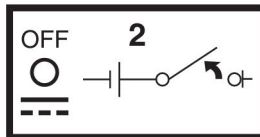
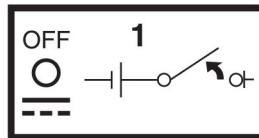
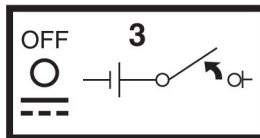
Statement 33:



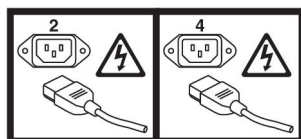
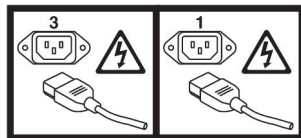
**CAUTION:**

This device does not provide a power control button. Removing power supply modules or turning off the server blades does not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

BladeCenter HT Type 8740:



BladeCenter HT Type 8750:



**Statement 34:**



**CAUTION:**

To reduce the risk of electric shock or energy hazards:

- This equipment must be installed by trained service personnel in a restricted-access location, as defined by the NEC and IEC 60950-1, First Edition, The Standard for Safety of Information Technology Equipment.
- Connect the equipment to a properly grounded safety extra low voltage (SELV) source. A SELV source is a secondary circuit that is designed so that normal and single fault conditions do not cause the voltages to exceed a safe level (60 V direct current).
- Incorporate a readily available approved and rated disconnect device in the field wiring.
- See the specifications in the product documentation for the required circuit-breaker rating for branch circuit overcurrent protection.
- Use copper wire conductors only. See the specifications in the product documentation for the required wire size.
- See the specifications in the product documentation for the required torque values for the wiring-terminal nuts.



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## Chapter 1. Introduction

The IBM® BladeCenter® HT Type 8740 and 8750 unit is a high-density, high-performance rack-mounted blade server system. The BladeCenter HT unit provides 12 bays for blade servers and other BladeCenter HT devices, integrating common resources that are shared by the blade servers. The use of common resources provides a small server-system footprint that contains high-performing servers with minimal cabling. The BladeCenter HT unit has the following features:

- Hot-swap capability, which allows you to add, remove, or replace blade servers, media trays, management modules, I/O modules, alarm panel modules, multiplexer expansion modules, power modules, and fans without removing power from the BladeCenter HT unit.
- A midplane that connects all BladeCenter HT components.
- A management module that functions as a systems-management processor. There are two management-module bays.
- Power modules that provide redundant power for all BladeCenter HT components. There are four power modules that operate in redundant pairs. Each pair provides power to selected BladeCenter HT components.
- Fans that provide cooling for most BladeCenter HT components. There are three fans connected to each power module on the front of the BladeCenter HT unit, and four hot-swap fan modules on the rear of the BladeCenter HT unit.
- Four input/output (I/O) module bays that support external network interface connections to network resources and other devices.
- Four high-speed input/output (I/O) module bays that support high-speed external network interface connections to network resources and other devices.
- A media tray that contains two Universal Serial Bus (USB) version 2.0 ports that can be used by any blade server, and two CompactFlash connectors that can be used by the management module. There are two media-tray bays.

This *Installation and User's Guide* provides information about the following tasks:

- Defining and recording your BladeCenter HT network configuration information
- Installing and cabling the BladeCenter HT unit
- Installing basic BladeCenter HT unit optional devices:
  - Media trays
  - Management modules
  - Management module interposers
  - I/O modules
  - I/O module interposers
  - Power modules
  - Blade servers
- Performing basic troubleshooting of the BladeCenter HT unit

Packaged with the *Installation and User's Guide* are software CDs that help you to configure and manage the BladeCenter HT unit. The CDs can be used with a USB or network CD-ROM drive.

You can obtain up-to-date information about your BladeCenter HT Type 8740 and 8750 unit and other IBM server products at <http://www.ibm.com/bladecenter/>.

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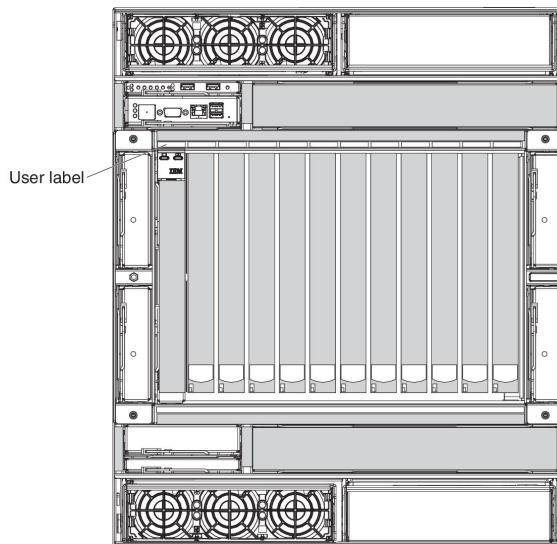
## Locating and recording BladeCenter HT unit information

Record information about your BladeCenter HT unit in the following table. You will need this information for future reference.

<b>Product name</b>	BladeCenter HT
<b>Machine type</b>	_____
<b>Model number</b>	_____
<b>Serial number</b>	_____

The serial number, machine type and model number are on labels on the top, front, and rear of the chassis.

A set of blank labels comes with each BladeCenter HT unit. Record identifying information on a label and place it on the BladeCenter HT unit top bezel, just above the blade server. Do not place the label on the blade server itself or in any way block the ventilation holes on the blade server.



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## Deployment scenarios

The IBM BladeCenter HT unit can be deployed to support a variety of networking goals and environments, such as:

- **Central Office (CO) environment**

The IBM BladeCenter HT is ideally suited for network telecommunications facilities or carrier-grade environments that require maximum equipment operability. The BladeCenter HT Type 8740 (dc power) is intended to be installed in a Common Bonding Network (or mesh network) as described in GR-1089-CORE, Issue 4.

- **Server consolidation**

The IBM BladeCenter HT unit can be used by organizations with multiple server locations that need to centralize or physically consolidate servers to increase flexibility, reduce maintenance costs, and reduce human resources.

- **e-business infrastructure**

The IBM BladeCenter HT unit can be used by companies that need to deploy new e-commerce and e-business applications and infrastructure quickly to minimize time to market, while at the same time ensuring flexibility, scalability, and availability.

- **Enterprise infrastructure**

The IBM BladeCenter HT unit can support an enterprise infrastructure through:

- **File and print:** For organizations with decentralized or departmental file and print servers that need to reduce the cost of ownership, increase reliability, and provide flexibility for growth.
- **Collaboration:** For customers needing a cost-effective way and reliable corporate solution for e-mail, calendar, and other collaboration capabilities.

- **High-performance computing**

The IBM BladeCenter HT unit can be used by customers with compute-intensive applications needing highly available clustered solutions to achieve significantly higher degrees of scalability and performance, all managed at a low cost.

- **Any location where the National Electric Code (NEC) applies.**

The IBM BladeCenter HT unit can be installed in any location where NEC requirements are used.

## Features and specifications

The following table provides a summary of the features and specifications of the BladeCenter HT unit. Depending on the model, some features might not be available, or some specifications might not apply.

<p><b>Media tray (on front):</b></p> <ul style="list-style-type: none"> <li>• Minimum: One hot-swap media tray</li> <li>• Maximum: Two hot-swap media trays</li> </ul> <p>Each media tray consists of:</p> <ul style="list-style-type: none"> <li>• Two internal CompactFlash slots</li> <li>• Two USB v2.0 ports (output power: 500 mA maximum)</li> <li>• Front system LED panel</li> </ul> <p><b>Blade bays (on front):</b> Twelve hot-swap blade server bays</p> <p><b>Module bays (on front):</b></p> <ul style="list-style-type: none"> <li>• Four hot-swap power-module bays</li> <li>• Four hot-swap high-speed I/O-module bays</li> <li>• Four hot-swap I/O-module bays</li> <li>• Two hot-swap management-module bays</li> <li>• Two hot-swap media trays</li> </ul> <p><b>Module bays (on rear):</b></p> <ul style="list-style-type: none"> <li>• Two hot-swap multiplexer expansion-module bays</li> <li>• One hot-swap alarm panel module bay <ul style="list-style-type: none"> <li>– Telco alarm connector</li> <li>– Direct serial connector for blade servers</li> <li>– Rear system LED panel</li> </ul> </li> <li>• Four hot-swap fan modules</li> </ul> <p><b>Power modules:</b></p> <p>BladeCenter HT Type 8740:</p> <ul style="list-style-type: none"> <li>• Minimum: Two dc hot-swap power modules that are configured for redundant operation</li> <li>• Maximum: Four dc hot-swap power modules that provide redundancy to all BladeCenter HT components</li> </ul> <p>BladeCenter HT Type 8750:</p> <ul style="list-style-type: none"> <li>• Minimum: Two ac hot-swap power modules that are configured for redundant operation</li> <li>• Maximum: Four ac hot-swap power modules that provide redundancy to all BladeCenter HT components</li> </ul>	<p><b>Management module:</b></p> <ul style="list-style-type: none"> <li>• Minimum: One hot-swap advanced management module</li> <li>• Maximum: Two hot-swap advanced management modules: one active, one hot stand-by</li> </ul> <p><b>Redundant cooling:</b> Four hot-swap fan-module bays (N+1 redundant)</p> <p><b>Upgradeable microcode:</b></p> <ul style="list-style-type: none"> <li>• Management-module firmware</li> <li>• I/O-module firmware (not all I/O module types)</li> <li>• Blade server firmware</li> </ul> <p><b>Security features:</b></p> <ul style="list-style-type: none"> <li>• Login password for remote connection</li> <li>• Secure Sockets Layer (SSL) security for remote management access</li> <li>• ANSI T1.276 enhanced security features</li> </ul> <p><b>Predictive Failure Analysis (PFA) alerts:</b></p> <ul style="list-style-type: none"> <li>• Fans</li> <li>• Blade-dependent features</li> </ul> <p><b>Size (12 U):</b></p> <ul style="list-style-type: none"> <li>• Height: 533.40 mm (21 in. or 12 U), minus 8 mm for clearance</li> <li>• Depth: <ul style="list-style-type: none"> <li>– Without optional bezel: 617 mm (24.29 in.)</li> <li>– With optional bezel: 706 mm (27.80 in.)</li> </ul> </li> <li>• Width: 442 mm (17.4 in.)</li> <li>• Weight: <ul style="list-style-type: none"> <li>– Full configured weight with blade servers: Approximately 158.8 kg (350 lb)</li> <li>– Empty chassis without modules or blade servers: Approximately 65.32 kg (144 lb)</li> </ul> </li> </ul>	<p><b>Environment (per Telcordia GR-63-CORE):</b></p> <ul style="list-style-type: none"> <li>• Operational: <ul style="list-style-type: none"> <li>– Altitude: -60 m to 1800 m (-197 ft to 6000 ft), 5° C to 40° C (41° F to 104° F)</li> <li>– Altitude: 1800 m to 4000 m (6000 ft to 13000 ft) 5° C to 30° C (41° F to 86° F)</li> <li>– Humidity: 5% to 85%</li> </ul> </li> <li>• Short term operational: <ul style="list-style-type: none"> <li>– Altitude: -60 m to 1800 m (-197 ft to 6000 ft), -5° C to 55° C (23° F to 131° F)</li> <li>– Altitude: 1800 m to 4000 m (6000 ft to 13000 ft), -5° C to 45° C (23° F to 113° F)</li> <li>– Humidity: 5% to 90% not to exceed 0.024 water/kg of dry air</li> </ul> </li> <li>• Shipping/Storage: <ul style="list-style-type: none"> <li>– Unit off: -40° C to 70° C (-40° F to 158° F), 30° C/hr maximum rate of change</li> <li>– Humidity: Uncontrolled</li> <li>– Acclimation of the system might be required after a period of high-humidity storage</li> </ul> </li> </ul> <p><b>Acoustics:</b> Declared sound power level: 7.8 bels, 25° C, sea level</p> <p><b>Electrical input (N+N redundant):</b></p> <p>BladeCenter HT Type 8740 input voltage (four inputs at 60 A rating each):</p> <ul style="list-style-type: none"> <li>• Minimum: -40 V dc</li> <li>• Maximum: -72 V dc</li> <li>• DC isolated</li> </ul> <p>BladeCenter HT Type 8750 input voltage (four inputs at 16 A rating each):</p> <ul style="list-style-type: none"> <li>• Minimum: 180 V ac</li> <li>• Maximum: 265 V ac</li> <li>• Sine-wave input (50/60 Hz single-phase)</li> </ul> <p><b>Heat output:</b> Approximate heat output in British thermal units (Btu) per hour:</p> <ul style="list-style-type: none"> <li>• BladeCenter HT Type 8740: <ul style="list-style-type: none"> <li>– Minimum configuration: 4270 Btu per hour (1251 watts)</li> <li>– Maximum configuration: 19680 Btu per hour (5766 watts)</li> </ul> </li> <li>• BladeCenter HT Type 8750: <ul style="list-style-type: none"> <li>– Minimum configuration: 4175 Btu per hour (1223 watts)</li> <li>– Maximum configuration: 21850 Btu per hour (6400 watts)</li> </ul> </li> </ul>
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**Note:** The intra-building ports of the equipment or subassembly are suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building ports of the equipment or subassembly must not be metallically connected to interfaces that connect to the outside plant (OSP) or its wiring. These interfaces are designed for use as intra-building interfaces only (type 2 or type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.

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## The BladeCenter HT components

The BladeCenter HT unit supports the following hot-swap components:

- Blade servers
- Media tray
- Advanced management modules
- I/O modules
- Power modules
- Fan modules
- Multiplexer expansion modules
- Alarm panel module

See “Major components of the BladeCenter HT Type 8740 and 8750 unit” on page 11 for the location of each module. These modules supply common functions to the blade servers that are installed in the blade bays in the front of the BladeCenter HT unit.

The BladeCenter HT unit and the active management module make optional I/O devices (USB devices, keyboard, video, and mouse) available to all the blade servers, selected by any one blade server at a time.

### Blade servers

The BladeCenter HT unit provides 12 bays for blade servers or other BladeCenter HT devices. A blade server is a hot-swap, independent server with its own processors, memory, storage, network controllers, operating system, and applications. The blade server is installed in a bay in the BladeCenter HT unit and shares power, fans, switches, and ports with other blade servers.

### Media tray

The BladeCenter HT unit comes with one hot-swap media tray in media tray bay 1. You can add a second media tray in media tray bay 2 to provide redundancy.

The media tray is a hot-swap module that provides two USB connectors for use by the blade servers, error LEDs, an ambient air temperature sensor and a pressure sensor for use by the advanced management module, and two CompactFlash bays.

### Advanced management module

The BladeCenter HT unit comes with one hot-swap advanced management module in management-module bay 1. You can add a second advanced management module in management-module bay 2 to provide redundancy.

**Note:** When installing an advanced management module into the BladeCenter HT unit, an advanced management-module interposer must be installed into the bay before installing the advanced management module.

The advanced management module is a hot-swap module that you use to configure and manage BladeCenter HT components. See the *User's Guide* that comes with the advanced management module for more information.

## I/O modules

The BladeCenter HT unit has eight hot-swap I/O-module bays that are compatible with three types of I/O modules (see “BladeCenter HT components and LEDs” on page 18 for the location of the I/O module bays). These bays can be used as follows:

### Notes:

1. When installing an I/O module into the BladeCenter HT unit, an I/O-module interposer must be installed into the bay before installing the I/O module.
  2. When installing a high-speed I/O module into the BladeCenter HT unit, a high-speed I/O-module interposer tray with interposer card must be installed into the bay before installing the high-speed I/O module.
- The modules in I/O bays 1 through 4 can be either of the following types:
    - Switch modules
    - Bridge modules
    - Passthrough modules
  - The modules in I/O bays 7 through 10 support high-speed I/O modules.

## Power modules

The BladeCenter HT unit is configured with two or four hot-swap power modules.

Power modules are required in bays 1 and 2, and they supply power to blade bays 1 through 6, media trays 1 and 2, management-module bays 1 and 2, and I/O-module bays 1 through 4.

Power modules are required in power module bays 3 and 4 if you install blade servers in blade bays 7 through 12 or if you install I/O modules in any of I/O-module bays 7 through 10.

Each pair of power modules operates as a redundant pair. If either power module fails, the remaining power module continues to supply power, but there is no redundancy; the failed power module must be replaced as soon as possible.

## Fan modules

The BladeCenter HT unit comes with four hot-swap fan modules for cooling redundancy. The fan module speeds vary depending on the ambient air temperature within the BladeCenter HT unit, which is reported by the media tray. If the ambient temperature is 25°C (77°F) or below, the BladeCenter HT unit fan modules will run at their minimum rotational speed, increasing their speed as required to control internal BladeCenter HT temperature. If the ambient temperature is above 25°C (77°F), the fan modules will run faster, increasing their speed as required to control internal BladeCenter HT unit temperature. Each fan module contains two fans operating as a pair in a series. If one fan fails, the remaining fan will run at full speed and continue to cool the BladeCenter HT unit. Replace a failed fan module as soon as possible, to restore cooling redundancy.

**Attention:** If more than two fan modules are removed or more than two fan modules experience a double fan failure, the blade servers will shut down within 1 to 3 seconds.

## Multiplexer expansion modules

The BladeCenter HT unit comes with two hot-swap multiplexer expansion modules for redundancy. The multiplexer expansion module controls the USB connectors,

video signal, console redirection, and status LEDs on the BladeCenter HT unit. Replace a multiplexer expansion module as soon as possible, to restore redundancy.

## Alarm panel module

The BladeCenter HT unit comes with an alarm panel module. The alarm panel provides telecom relays and LED alarm status with additional functionality of a serial console through the serial port on each blade server in the chassis using an external breakout cable.

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## The IBM BladeCenter HT Documentation CD

The IBM *BladeCenter HT Documentation* CD contains documentation for your BladeCenter HT unit in Portable Document Format (PDF) and includes the IBM Documentation Browser to help you find information quickly.

## Hardware and software requirements

The IBM BladeCenter HT *Documentation* CD requires the following minimum hardware and software:

- Microsoft Windows NT, Windows 2000, or Red Hat Linux
- 100 MHz microprocessor
- 32 MB RAM
- Adobe Acrobat Reader 3.0 (or later) or xpdf, which comes with Linux operating systems.

## 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 in 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-language version is displayed.

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

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

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

When you select a document, a description of the document is displayed 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.

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## Related documentation

In addition to this *Installation and User's Guide*, the following related documentation is provided in Portable Document Format (PDF) at <http://www.ibm.com/supportportal/> or on the *IBM BladeCenter HT Documentation* CD that comes with your BladeCenter HT unit:

- *BladeCenter HT Problem Determination and Service Guide*  
This document is in Portable Document Format (PDF) on the IBM Documentation CD. It contains information to help you solve problems yourself, and it contains information for service technicians.
- *BladeCenter HT 2-Post Rack Installation Instructions*  
This document is in Portable Document Format (PDF) on the IBM Documentation CD. It contains instructions for installing the BladeCenter HT unit in a 2-post rack.
- *BladeCenter HT 4-Post Rack Installation Instructions*  
This document is in Portable Document Format (PDF) on the IBM Documentation CD. It contains instructions for installing the BladeCenter HT unit in a 4-post rack.
- *IBM BladeCenter HT Advanced Management Module Interposer and Flex Cable Assembly Installation Instructions*  
This document provides the installation instructions and warranty information for an IBM BladeCenter HT Advanced Management Module Interposer and Flex Cable Assembly.
- *BladeCenter HT Advanced Management Module Installation Guide*  
This document contains instructions for installing the advanced management module in the BladeCenter HT unit and creating the initial configuration.
- *BladeCenter HT Management Module User's Guide*  
This document provides general information about the advanced management module for your BladeCenter HT unit, including information about features, how to configure the management module, and how to get help.
- *BladeCenter HT Management Module Command-Line Interface Reference Guide*  
This document explains how to use the advanced management-module command-line interface to directly access BladeCenter HT 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.



- *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.
- *Warranty and Support Information*  
This document contains information about the terms of the warranty and getting service and assistance.
- *IBM BladeCenter HT Redundant Media Tray Installation Instructions*  
This document provides the installation instructions and warranty information for an IBM BladeCenter HT Redundant Media Tray.
- *BladeCenter HT CompactFlash Module*  
This document provides the installation instructions and warranty information for an IBM BladeCenter HT CompactFlash Module.
- *IBM BladeCenter HT AC Power Supply Modules Installation Instructions*  
This document provides the installation instructions and warranty information for an IBM BladeCenter HT AC Power Supply Module.
- *IBM BladeCenter HT DC Power Supply Modules Installation Instructions*  
This document provides the installation instructions and warranty information for an IBM BladeCenter HT DC Power Supply Module.
- *IBM BladeCenter HT Interposer for Gb Switch/Bridge Bays and IBM BladeCenter HT Interposer for Gb Switch/Bridge Bays with Interswitch Links (ISL) Installation Instructions*  
This document provides the installation instructions and warranty information for the IBM BladeCenter HT Interposer for Gb Switch/Bridge Bays and the IBM BladeCenter HT Interposer for Gb Switch/Bridge Bays with Interswitch Links (ISL).
- *IBM BladeCenter HT Interposer for HS Switch Bay Installation Instructions*  
This document provides the installation instructions and warranty information for an IBM BladeCenter HT Interposer for HS Switch Bay.
- *IBM BladeCenter HT Bezel Installation Instructions*  
This document provides the installation instructions and warranty information for the IBM BladeCenter HT Bezel option.
- *IBM BladeCenter HT Bezel Filter 4-Pack Option*  
This document provides warranty information for the IBM BladeCenter HT Bezel Filter 4-Pack Option.

Additional documents might be included on the IBM *BladeCenter HT Documentation* CD.

Depending on your BladeCenter HT product, additional documentation might be included on the IBM BladeCenter HT Documentation CD.

To check for updated documentation and technical updates, complete the following steps.

**Note:** Changes are made periodically to the IBM Web site. The actual procedure might vary slightly from what is described in this document.

1. Go to <http://www.ibm.com/supportportal/>.
2. Under **Product support**, click **BladeCenter**.

3. Under **Popular links**, click **Publications lookup**.
4. From the **Product family** menu, select **BladeCenter HT**.
5. From the **Type** menu, select **8740** or **8750** and click **Continue**.

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## Notices and statements in this document

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

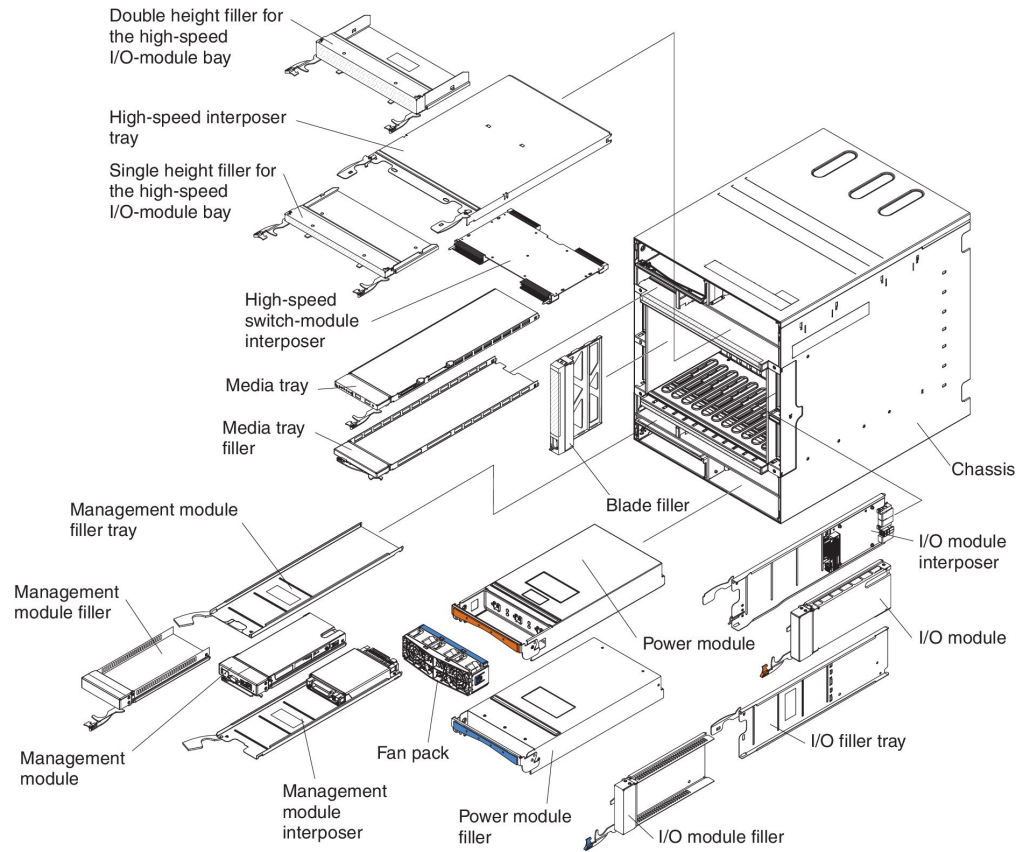
The following notices and statements are used in this document:

- **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.

# Major components of the BladeCenter HT Type 8740 and 8750 unit

The following illustrations show the locations of the major components in the BladeCenter HT unit.

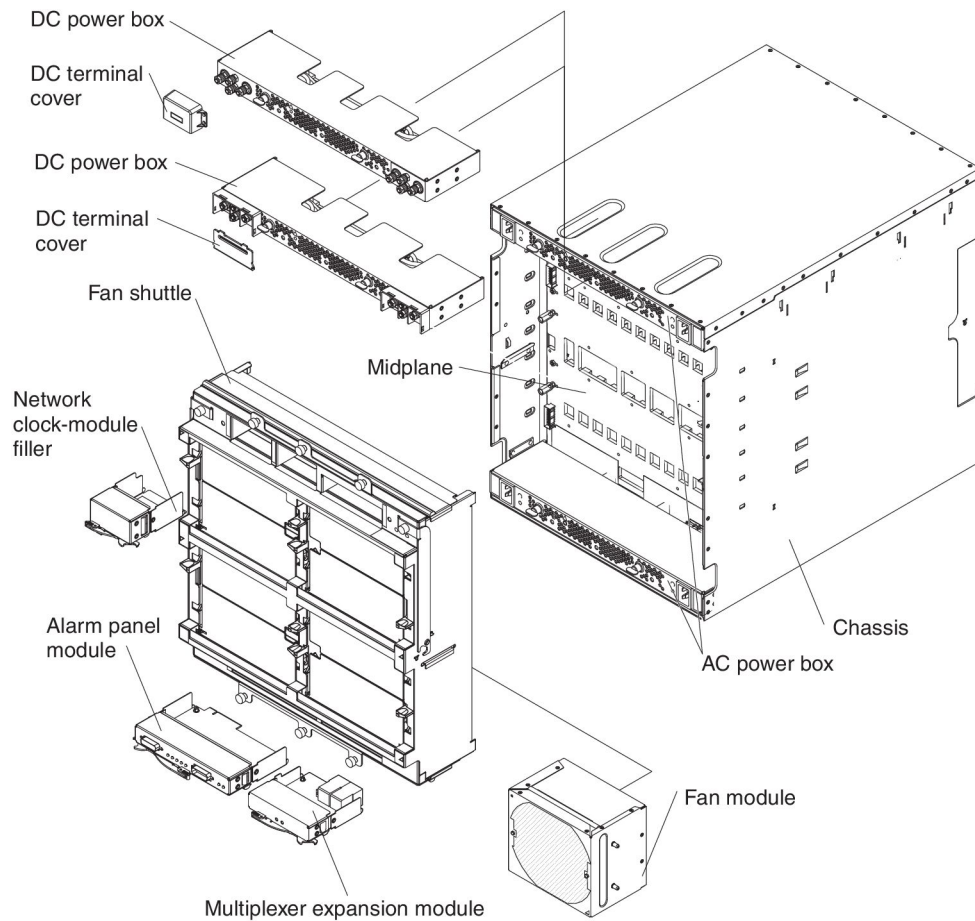
## Front view



## Rear view

### Notes:

1. The BladeCenter HT unit comes with two dc power boxes or two ac power boxes. The power boxes cannot be changed from the type that is already installed.
2. If you have a dc power box in your BladeCenter HT unit, the type of dc terminal cover you have might vary. Both types of dc terminal covers are shown in the following illustration, but your BladeCenter HT unit has only one type.



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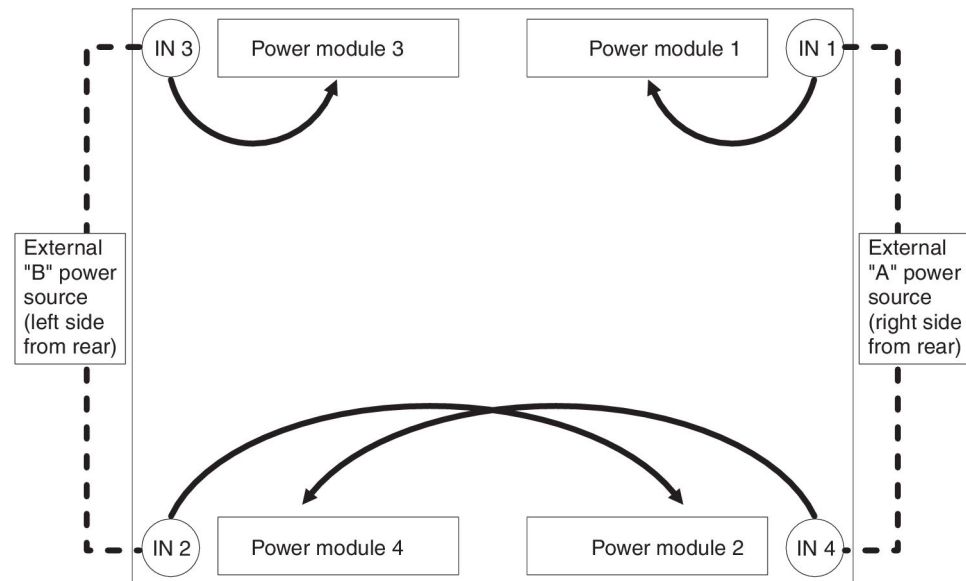
## Chapter 2. BladeCenter HT unit power, components, and indicators

This section contains power requirements, component information, and it identifies light-emitting diodes (LEDs) for the BladeCenter HT unit.

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### Supplying power to the BladeCenter HT unit

The BladeCenter HT unit does not have a power switch. The BladeCenter HT unit has four power connectors; each powers a power module. As viewed from the rear of the BladeCenter HT unit, power connector 1 (top-right connector) supplies power to power-module bay 1, power connector 2 (bottom-left connector) supplies power to power module 2, power connector 3 (top-left connector) supplies power to power module 3, and power connector 4 (bottom-right connector) supplies power to power module 4.



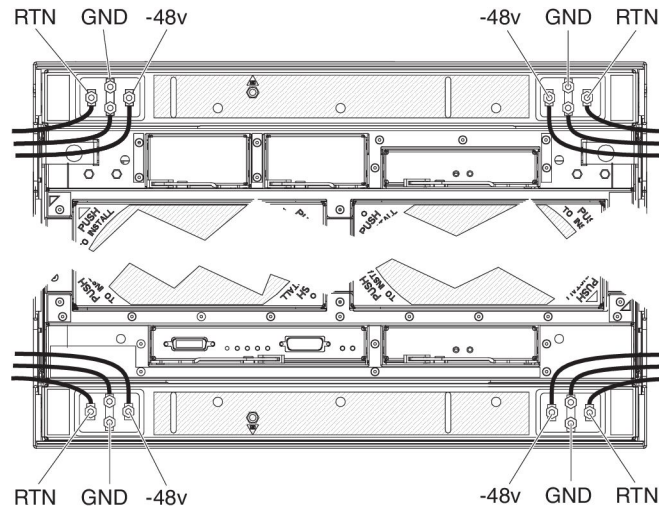
Power modules 1 and 2 are redundant and provide power to blade bays 1 through 6, while power modules 3 and 4 are redundant and provide power to blade bays 7 through 12. To ensure power redundancy, a typical power configuration is to supply power to power connectors 1 and 4 from one power source location, while supplying power to power connectors 2 and 3 from another power source location.

**Important:** The release handles on the fan shuttle have a safety switch that disables power output from the power boxes. If the release handles are not secured to the chassis with the thumbscrews, the BladeCenter HT unit will not power on.

## Connecting the BladeCenter HT type 8740 to dc power:

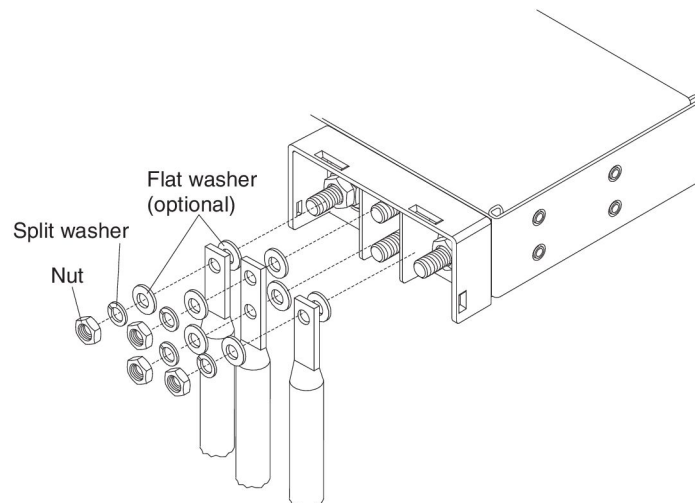
The BladeCenter HT dc-power inputs are configured for dc isolated return (DC-I). The dc RETURN (RTN) terminal or conductor is not connected to the equipment frame or the grounding means of the equipment.

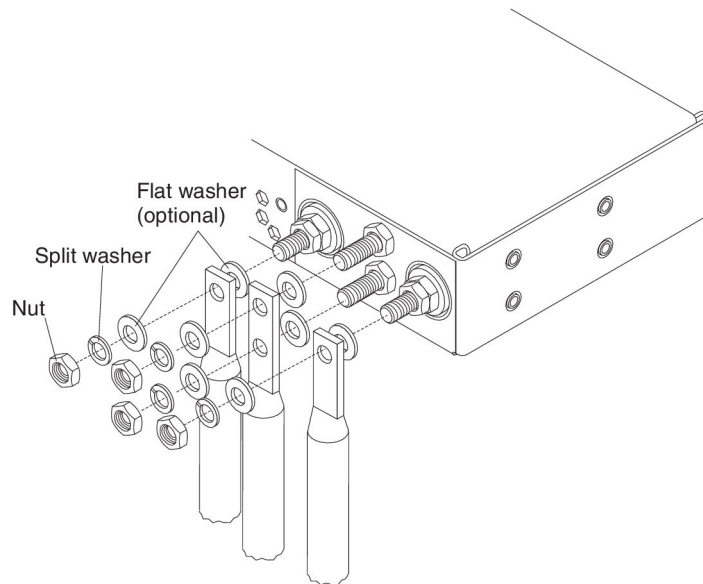
**Attention:** Only trained service personnel, other than IBM service technicians, are authorized to make the connections to and disconnections from the dc power source. IBM service technicians are not certified or authorized to install or remove the dc power cables. The customer is responsible for ensuring that only trained service personnel install or remove the dc power cables.



The BladeCenter HT type 8740 has four dc-power terminal connectors. Each dc terminal has four #M6 (0.25-inch) studs, one for -48 V dc, one for RETURN (RTN), and two for connecting the safety ground wire. Each terminal has a terminal cover. Remove the terminal cover before connecting cables to each terminal and reinstall the terminal cover on each terminal before supplying power to the BladeCenter HT unit. For more information on removing and installing a terminal cover, see “Removing a dc terminal cover” on page 42 and “Installing a dc terminal cover” on page 61.

There are two types of terminal covers, depending on date of manufacture. The following illustrations show both types of terminal boxes for the two types of terminal covers.





When connecting a wire to each stud, install a flat washer (optional) on the stud, install the wire, install a flat washer (optional), install a split washer and then install the nut.

The following guidelines are provided for connecting a 60 A BladeCenter HT unit to a -48 V dc power source:

- The power source must have a minimum of 80 A overcurrent protection. See article 240, paragraph 3, table 310-16 of the National Electric Code for more information about electrical wiring requirements.
- The overcurrent protective device or circuit breaker must be accessible to service personnel to prevent the power from being turned on by someone other than the technician servicing the BladeCenter HT unit.
- The BladeCenter HT unit has a dc wire rating of 4 AWG (circular mil area of 33100-52600) and rated 90 degree C.

**Note:** The actual wire gauge and ring terminal will be determined by the current draw and the length of wire run or as specified by the customer premises guidelines.

- Flexible dc wiring is recommended to allow for minimum bend radius.
- The supply wiring to the power connectors must be terminated in UL recognized insulated ring terminals, sized for a M6 stud, 4 AWG wire (circular mil area of 33100-52600) and a wire insulation diameter of 12.8 to 13.1 mm. An example of this type of ring terminal is Amp Plasti-Grip type 52043-1 using Tyco Electronics Hydraulic Crimping Tool part number 1490749-1.
- For NEBS compliance, the protective earthing conductor must use copper conductors with a size minimum of 6 AWG (circular mil area of 20800-33100) and must be terminated in a UL recognized two hole lug sized for a M6 stud. Chassis ground studs are on 5/8-inch centers. An example of this type of two hole lug is the Thomas and Betts part number 54205 using the Thomas and Betts crimping tool model TBM-25S.
- Torque the wiring-terminal nuts to 1.5 newton-meters (13.3 inch-pounds)

For more information, see Statement 34 in “Safety” on page vii.

## Connecting the BladeCenter HT type 8750 to ac power:

The BladeCenter HT unit has four ac-power C20 input connectors. Two C20/C19 type ac jumper cords are supplied with the BladeCenter HT unit. To supply power to the BladeCenter HT unit, connect one end of each power cord to a power connector on the rear of the BladeCenter HT unit and the other end of each power cord to a 200-240 volt 20 amp power distribution unit or appropriate electrical outlet. An external Surge Protective Device (SPD) is not required at the ac-power input of the BladeCenter HT unit.

The blade servers in the BladeCenter HT unit are connected to power but are not turned on. After the BladeCenter HT unit has power, depending on the configuration settings, the blade servers might have to be individually turned on.

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## Disconnecting power from the BladeCenter HT unit

You can shut down the BladeCenter HT unit by turning off the blade servers and disconnecting the BladeCenter HT unit from the power source.

To disconnect power from the BladeCenter HT unit, complete the following steps:

1. Shut down each blade server. See the documentation that comes with your blade servers for the procedure for shutting down the operating system.
2. Disconnect power from the BladeCenter HT unit.

**Note:** After you disconnect the BladeCenter HT unit from power, wait at least 5 seconds before you connect the BladeCenter HT unit to power again.

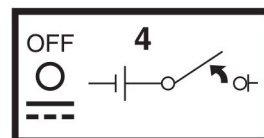
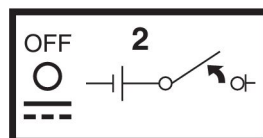
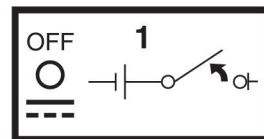
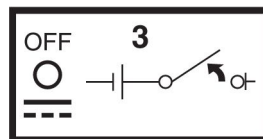
- BladeCenter HT type 8740:
  - a. Make sure the blade servers are powered off.

### Statement 33:



### CAUTION:

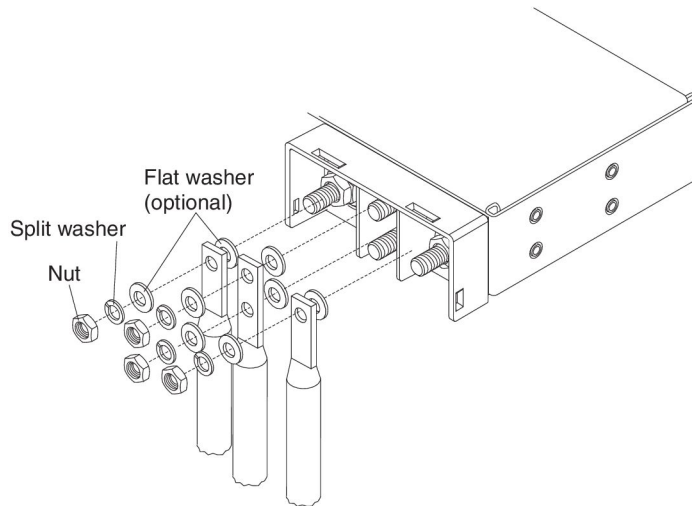
**This device does not provide a power control button. Removing power supply modules or turning off the server blades does not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.**





**Attention:** Only trained service personnel, other than IBM service technicians, are authorized to make the connections to and disconnections from the -48 volt dc power source. IBM service technicians are not certified or authorized to install or remove the -48 volt power cable. The customer is responsible for ensuring that only trained service personnel install or remove the -48 volt power cable.

- b. Turn off the power source.
- c. Remove the dc terminal cover for each power terminal. See “Removing a dc terminal cover” on page 42 for more information.



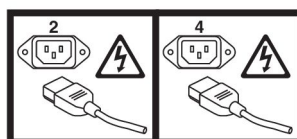
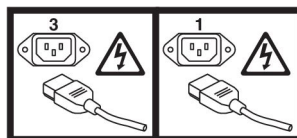
- d. Remove the nut, split washer, flat washer, and power cord from each terminal post.
- e. Remove the power cables.
- BladeCenter HT type 8750:
  - a. Make sure the blade servers are powered off.

**Statement 33:**



**CAUTION:**

This device does not provide a power control button. Removing power supply modules or turning off the server blades does not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



- b. Disconnect all power cords on the BladeCenter HT unit from the power connectors.

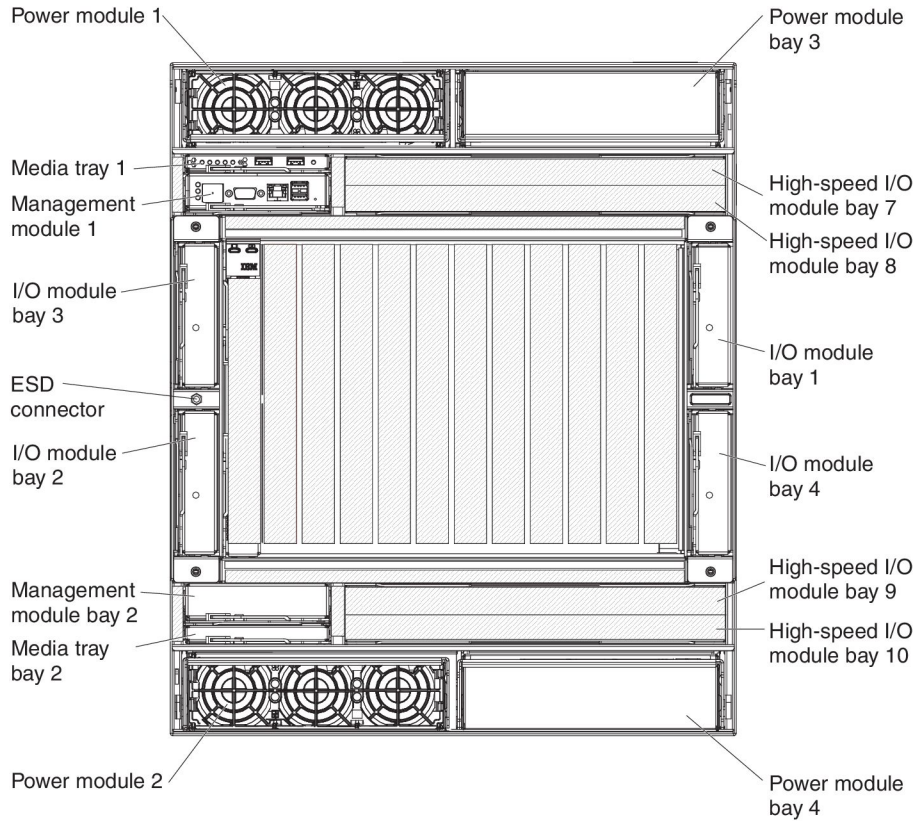
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## BladeCenter HT components and LEDs

This section identifies the components and LEDs on the front and rear of the BladeCenter HT unit.

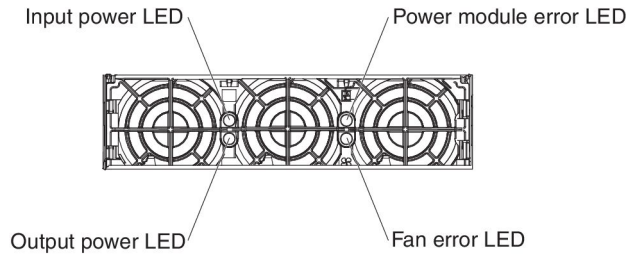
### Front view

This section identifies the components, controls, and LEDs on the front of the BladeCenter HT unit.



## Power modules

The following illustration shows the LEDs on each power module.



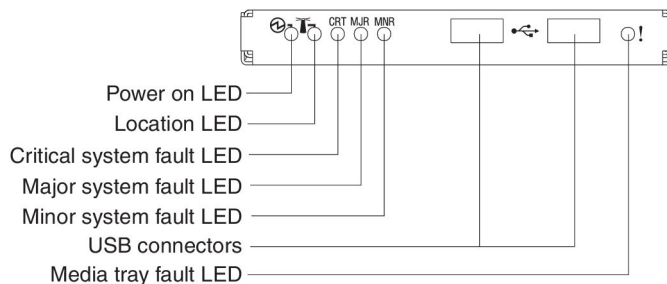
The LEDs on each power module indicate the condition of the power module and fan pack.

**Note:** The orientation of the power module that is shown in the illustration is for one of the top power modules. Modules in the bottom power-module bays are rotated 180°.

- **Input power LED:** When this green LED is lit, the input from the external power source connected to the power module is present and within specifications. During typical operation, both the input power and output power LEDs are lit.
- **Power-module error LED:** When this amber LED is lit, a power-module failure has occurred, and the power module is not operating within specifications.
- **Fan error LED:** When this amber LED is lit, a fan pack has failed and is not operating within specifications.
- **Output power LED:** When this green LED is lit, the output from the power module to the other components and blade servers is present and within specifications. During typical operation, both the input power and output power LEDs are lit.

## Media tray

The media tray contains the following components:



### • LED panel

The LEDs on the LED panel provide status information for your BladeCenter HT unit.

**Note:** You can turn off the location LED through the advanced management module.

- **Power-on:** When this green LED is lit, power is present in the BladeCenter HT unit. When this LED is off, the power subsystem, the power module, or the LED has failed.

**Attention:** If the power-on LED is off, it does not mean that electrical current is not present in the BladeCenter HT unit. The LED might be defective. To remove all electrical current from the BladeCenter HT unit, you must disconnect all power cords from all power input connectors.

- **Location:** When this blue LED is lit or flashing, it has been turned on by the system administrator to aid in visually locating the BladeCenter HT unit. If a blade server requires attention, the location LED on the blade server usually will also be lit. After the BladeCenter HT unit has been located, you can have the system administrator turn off the location LED.
- **Critical system fault:** When this LED is lit, the BladeCenter HT unit has a critical system fault. A critical system fault is an error or event that is detected by the system with a significant impact to the system. In this case, the system cannot continue to operate or is operating in a non-redundant power configuration or a non-redundant cooling configuration.

**Note:** The color of this LED can be set to amber or red through the advanced management module.

- **Major system fault:** When this LED is lit, the BladeCenter HT unit has a major system fault. The system can continue to operate but might lose some function and performance.

**Note:** The color of this LED can be set to amber or red through the advanced management module.

- **Minor system fault:** When this amber LED is lit, the BladeCenter HT unit has a minor system fault. The system can continue to operate, usually without noticeable loss of functionality or performance.
- **Media tray fault:** When this amber LED is lit, there is a fault on the media tray. The system can continue to operate, usually without the use of the components on the media tray.

- **USB connectors:** Use these connectors to attach USB v2.0, or earlier, compatible devices.

### Management modules

See the management module documentation on the *IBM BladeCenter HT Documentation CD* that comes with your BladeCenter HT unit for a description of the LEDs and connectors on the module.

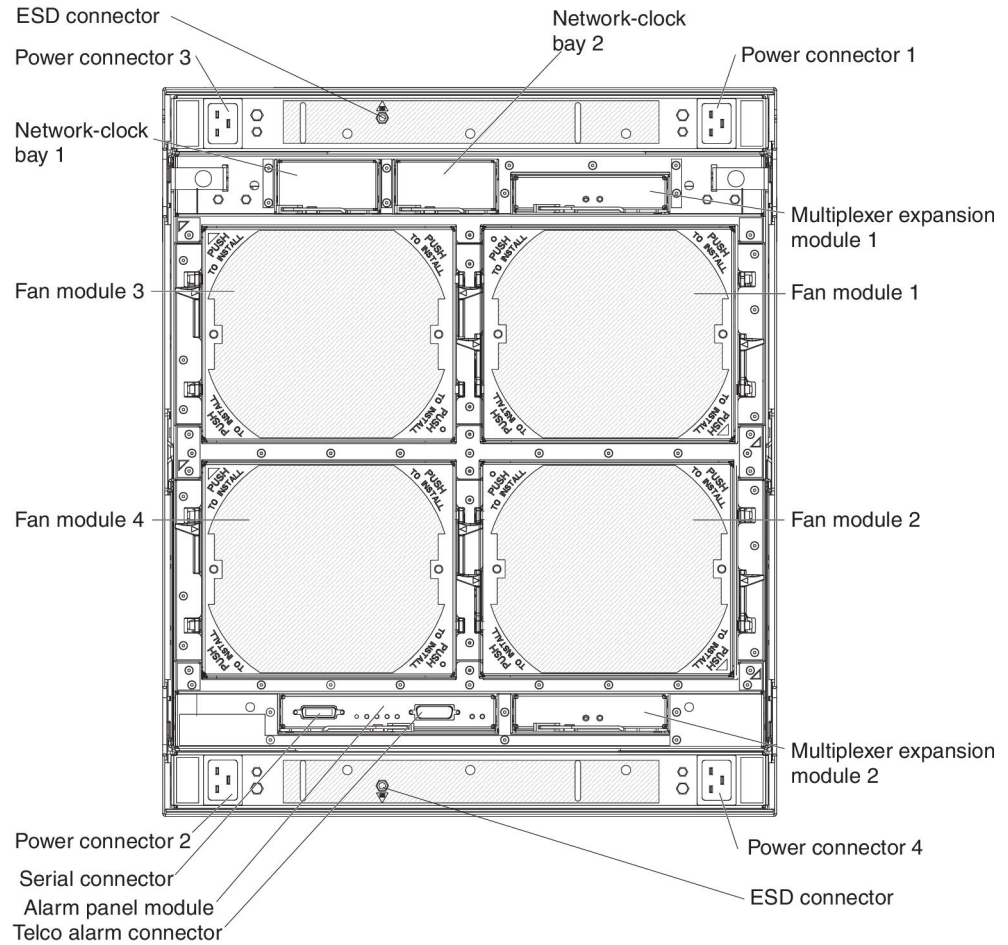
### I/O modules

See the documentation that comes with each I/O module for a description of the LEDs and connectors on the I/O module.

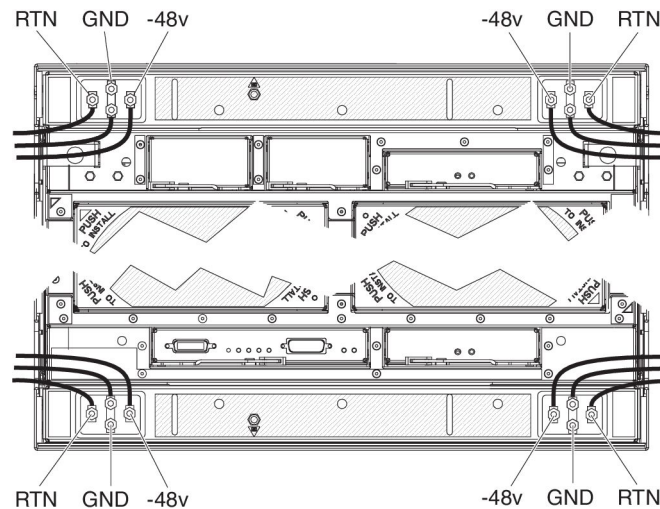
## Rear view

This section identifies the components, connectors, and LEDs on the rear of the BladeCenter HT unit.

The following illustration shows a BladeCenter HT Type 8750 with ac-power connectors.



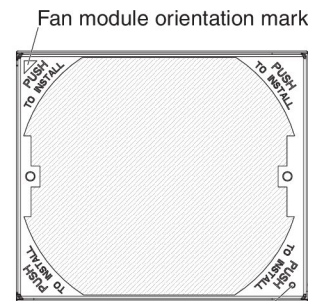
The following illustration shows a BladeCenter HT Type 8740 with dc-power connections.



## Power connectors

Connect a power cord from each power connector to an appropriate power source. See “Supplying power to the BladeCenter HT unit” on page 13 for more information.

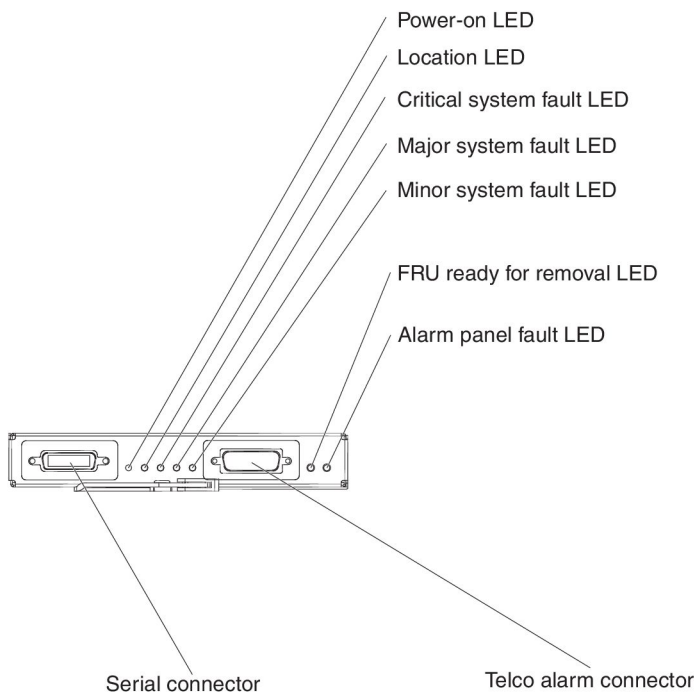
## Fan modules



Fan module fault LED

When the amber LED on a fan module is lit, an error has been detected in the fan module.

## Alarm panel module



The alarm panel module provides telecom relays and LED alarm status with additional functionality for access to a serial port on each blade server in the chassis through an external breakout cable.

- **Power-on:** When this green LED is lit, power is present in the BladeCenter HT unit. When this LED is off, the power subsystem, the power module, or the LED has failed.

**Attention:** If the power-on LED is off, it does not mean that no electrical current is present in the BladeCenter HT unit. The LED might be defective. To remove all electrical current from the BladeCenter HT unit, you must disconnect all power cords from the rear power connectors.

- **Location:** When this blue LED is lit or flashing, it has been turned on by the system administrator, to aid in visually locating the BladeCenter HT unit. If a

blade server requires attention, the location LED on the blade server usually will also be lit. After the BladeCenter HT unit has been located, you can have the system administrator turn off the location LED.

- **Critical system fault:** When this LED is lit, the BladeCenter HT unit has a critical system fault. A critical system fault is an error or event that is detected by the system with a significant impact to the system. In this case, the system cannot continue to operate or is operating in a non-redundant power configuration or a non-redundant cooling configuration.

**Note:** The color of this LED can be set to amber or red through the advanced management module.

- **Major system fault:** When this LED is lit, the BladeCenter HT unit has a major system fault. The system can continue to operate but may lose some functionality and performance.

**Note:** The color of this LED can be set to amber or red through the advanced management module.

- **Minor system fault:** When this amber LED is lit, the BladeCenter HT unit has a minor system fault. The system can continue to operate, usually without noticeable loss of functionality or performance.
- **FRU ready for removal:** When this blue LED is lit, it is safe to remove the device from the BladeCenter HT unit.
- **Alarm panel module fault:** When this amber LED is lit, there is a fault on the alarm panel module. The system can continue to operate, usually without the use of the components on the alarm panel module.
- **Serial connector:** This DB60 connector provides direct access to the serial ports on each of the 12 blade server bays. Use this connector to attach the optional serial port breakout cable and connect up to 12 local consoles. See the documentation that comes with your blade server to determine if it supports this cable.
- **Telco alarm connector:** The alarm panel module provides one DB15 connector (male) 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. The following table shows the pinouts for the alarm panel interface connector.

Pin #	Description	Input/Output signal
1	Minor alarm reset +	Input
2	Minor alarm reset -	Input
3	Major alarm reset +	Input
4	Major alarm reset -	Input
5	Critical alarm normally open	Output
6	Critical alarm normally closed	Output
7	Critical alarm common	Output
8	Minor alarm normally open	Output
9	Minor alarm normally closed	Output
10	Minor alarm common	Output
11	Major alarm normally open	Output
12	Major alarm normally closed	Output
13	Major alarm common	Output

Pin #	Description	Input/Output signal
14	Reserved	Reserved
15	Reserved	Reserved

The electrical specifications for the alarm panel interface 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**

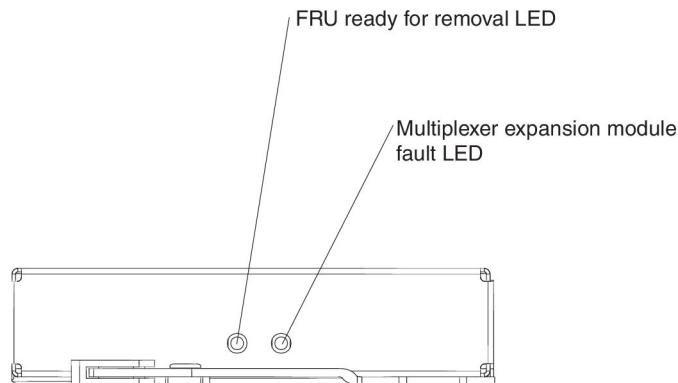
- Voltage range: 0 V dc to -100 V dc (including transients)
- Differential input voltage: 3 V dc to 72 V dc

– **Reset input activation**

Pulse width: 200 ms (minimum) to 300 ms

**Note:** The reset input only resets the state of the relay contact. The chassis alarm status does not change.

## Multiplexer expansion module



The multiplexer expansion module controls the USB connectors, video signals, and management module connections to the blade servers. There are two information LEDs on the multiplexer expansion module:

- **FRU ready for removal:** When this blue LED is lit, it is safe to remove the device from the BladeCenter HT unit.

**Note:** When removing the multiplexer expansion module, another multiplexer expansion module must be installed in its place to maintain proper cooling in the BladeCenter HT unit.

- **Multiplexer expansion module fault:** When this amber LED is lit, there is a fault on the multiplexer module. The system can continue to operate, usually without the use of the components on the multiplexer module.



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## Chapter 3. Installing the BladeCenter HT unit and options

This chapter provides instructions for installing the BladeCenter HT unit into a rack and adding optional devices to your BladeCenter HT unit. Some removal instructions are provided, in case you have to remove one device to install another.

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### Installation checklist

Before you can use the BladeCenter HT unit, you must install and configure the required components in the BladeCenter HT unit. If you have not already done so, perform the activities on the following checklist:

- \_\_\_ 1. Set up the rack or cabinet in which you will install the BladeCenter HT unit. See the documentation that comes with your rack and rack mounting kit.
- \_\_\_ 2. Connect an ESD wrist strap to the ESD connector on the BladeCenter HT unit before removing or installing any components. See “Front view” on page 18 and “Rear view” on page 21 for the ESD connector locations on the BladeCenter HT unit.
- \_\_\_ 3. Remove any modules that come installed in the BladeCenter HT unit to reduce the weight of the unit. See “Removing components from a BladeCenter HT unit” on page 28 for instructions.
- \_\_\_ 4. Install the BladeCenter HT unit into the rack. See the *BladeCenter HT 4-Post Rack Installation Instructions* or *BladeCenter HT 2-Post Rack Installation Instructions*.
- \_\_\_ 5. Reinstall the removed modules in the BladeCenter HT unit. See “Installing components into a BladeCenter HT unit” on page 44 for instructions.  
  
**Note:** Make sure that the BladeCenter HT unit has adequate power to support all of the installed components. The BladeCenter HT unit must contain either two or four power modules. See “The BladeCenter HT components” on page 5 and “Supplying power to the BladeCenter HT unit” on page 13 for more information.
- \_\_\_ 6. Install the required BladeCenter HT unit components.
- \_\_\_ 7. Supply power to the BladeCenter HT unit. See “Supplying power to the BladeCenter HT unit” on page 13 for more information.
- \_\_\_ 8. Make sure that the latest level of firmware is installed on all of the BladeCenter HT components. See <http://www.ibm.com/systems/support/> for additional information.
- \_\_\_ 9. Configure the management module in the BladeCenter HT unit. See the *BladeCenter HT Advanced Management Module Installation Guide* that comes with your management module for information and instructions.
- \_\_\_ 10. Determine the BladeCenter HT unit configuration settings, such as the IP address, network address, and Wake on LAN settings. Record the BladeCenter HT configuration setting information in Appendix A, “BladeCenter HT management-module configuration worksheet,” on page 77. See the *BladeCenter HT Management Module User's Guide* that comes with your management module for instructions for configuring an IP address.
- \_\_\_ 11. Configure the I/O modules in the BladeCenter HT unit. See the documentation for your I/O modules for configuration information.
- \_\_\_ 12. Configure the blade servers. See the *Installation and User's Guide* that comes with your blade server for information and instructions.

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## Installing the BladeCenter HT unit in a rack

Install the BladeCenter HT unit in a rack before you install any modules or blade servers in the BladeCenter HT unit. Reduce the weight of your BladeCenter HT unit by removing any blade servers, power modules, and fan modules that are preinstalled. The fan shuttle must also be removed from the rear of the BladeCenter HT unit. You can further reduce the weight of the BladeCenter HT unit by removing any preinstalled media trays, management modules, and I/O modules. Lift handles come with your BladeCenter HT unit. See the rack installation instructions for more information on installing the lift handles. Instructions for installing a BladeCenter HT unit in a 4-post rack are in the *BladeCenter HT 4-Post Rack Installation Instructions* and instructions for installing a BladeCenter HT unit in a 2-post rack are in the *BladeCenter HT 2-Post Rack Installation Instructions* that come with the BladeCenter HT unit.

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## Installation guidelines

Before you install any modules or fillers in the BladeCenter HT unit, read the following information:

- Read the safety information that begins on page vii and the guidelines in “Handling static-sensitive devices” on page 27. This information will help you work safely.
- 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 HT unit is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- You do not have to disconnect the BladeCenter HT unit from power to install or replace any of the hot-swap modules in the BladeCenter HT unit. You must shut down the operating system and turn off a blade server before you remove the blade server, but you do not have to shut down the BladeCenter HT unit itself.
- Blue on a component indicates touch points where you can grip the component to open and close a latch, or grab a component to remove it from or install it into the BladeCenter HT unit.
- For a list of supported optional devices for the BladeCenter HT unit, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

## System reliability guidelines

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

- Each of the module bays on the BladeCenter HT unit has either a module or a module filler installed.
- Each of the blade bays on the front of the BladeCenter HT unit has either a blade server or a blade filler installed.
- Each of the drive bays in a blade server storage expansion unit has either a hot-swap drive or a filler installed.
- A removed hot-swap module, blade server, or drive is replaced within 1 minute of removal.
- Cables for the optional modules are routed according to the illustrations and instructions in this document.
- A failed fan is replaced as soon as possible, to restore cooling redundancy.

## Handling static-sensitive devices

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

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. Use an ESD wrist strap and the ESD connectors on the BladeCenter HT unit. See “Front view” on page 18 and “Rear view” on page 21 for the locations of the ESD connectors on your BladeCenter HT unit. The ESD wrist strap safely channels the electricity from your body to a proper ground (the BladeCenter HT unit). 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 HT unit). Use an ESD wrist strap whenever you are working on the BladeCenter HT unit and BladeCenter HT components.

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

- Use an ESD wrist strap whenever you are working on the BladeCenter HT unit and BladeCenter HT components.
- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the BladeCenter HT unit or rack 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 immediately without setting it down. If it is necessary to set down the device, put it back into its static-protective package.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.

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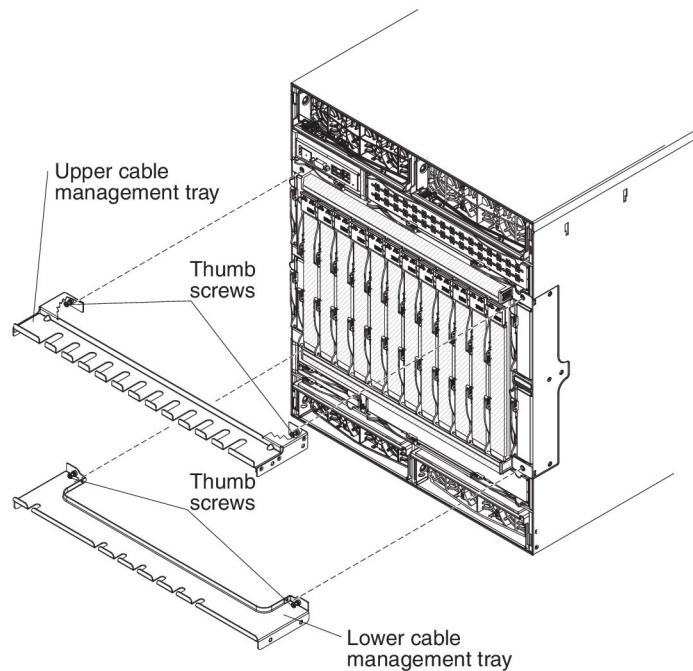
## Removing components from a BladeCenter HT unit

The following procedures are for removing components or optional devices from the BladeCenter HT unit.

### Removing a cable management tray

The cable management trays can be installed with or without the BladeCenter HT bezel. To remove the cable management trays and the BladeCenter HT bezel, see the *IBM BladeCenter HT Bezel Installation Instructions* for more information.

To remove a cable management tray that is installed without the BladeCenter HT bezel, complete the following steps:

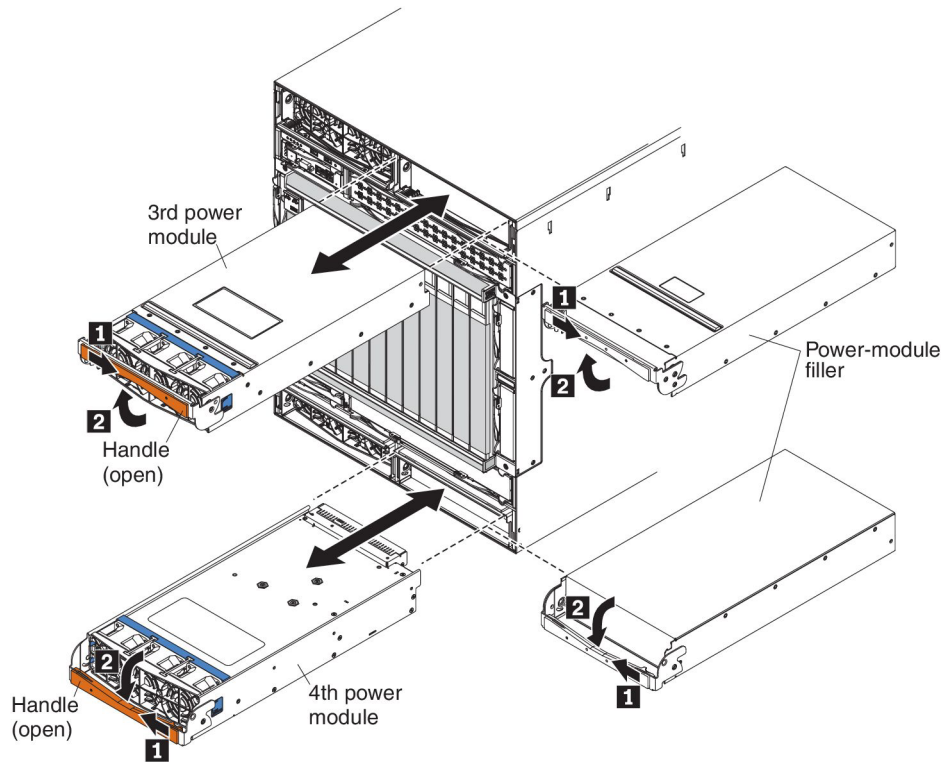


1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Hold the cable management tray with one hand and use a phillips-head screwdriver to loosen the captured thumb screws that attach the cable management tray to the BladeCenter HT unit.
3. Pull the cable management tray away from the BladeCenter HT unit.
4. Repeat these steps for the other cable management tray.

## Removing a power module

To remove a power module, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.

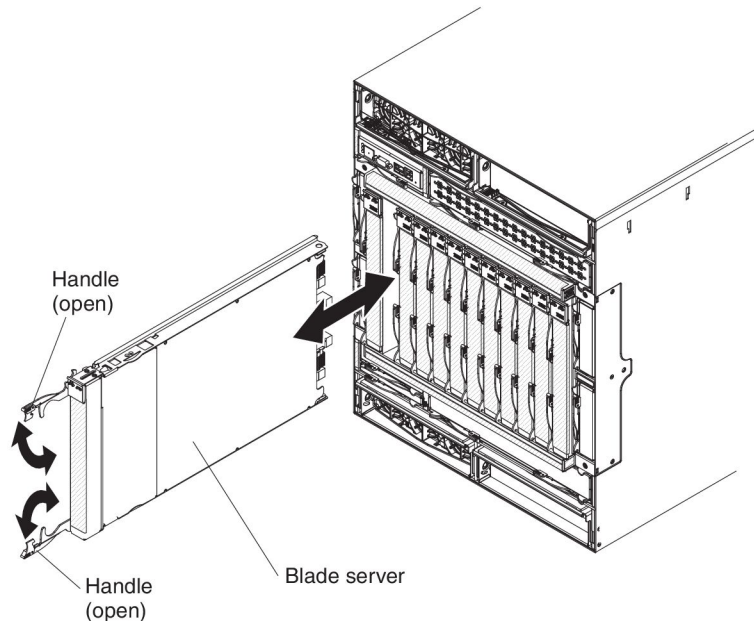


2. Open the power-module handle, using one of the following procedures:
  - For a power module in one of the upper power-module bays, push the inner handle release to the right; then, pull the handle up to the open position.
  - For a power module in one of the lower power-module bays, push the inner handle release to the left; then, pull the handle down to the open position.
3. Use the handle to pull the module out of the bay.

## Removing a blade server

**Attention:** Note the bay number. Reinstalling a blade server into a different bay other than the one from which it was removed can have unintended consequences. Some configuration information and update options are established according to bay number.

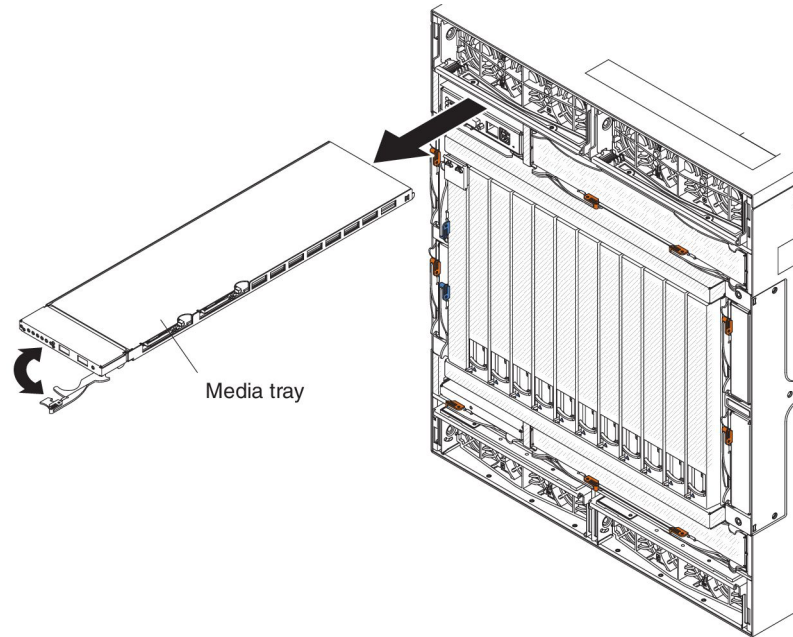
To remove a blade server, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Shut down the blade-server operating system; then, shut down the blade server. See the documentation that comes with your blade servers for the procedure to shut down the operating system. Wait at least 30 seconds until the drives stop spinning, before you proceed to the next step.
3. Move the two release handles to the open position. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).
4. Pull the blade server out of the bay.

## Removing a media tray

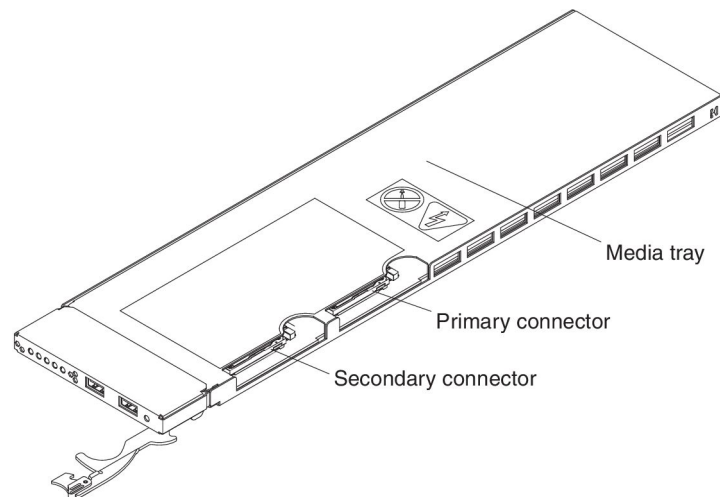
To remove a media tray, complete the following steps.



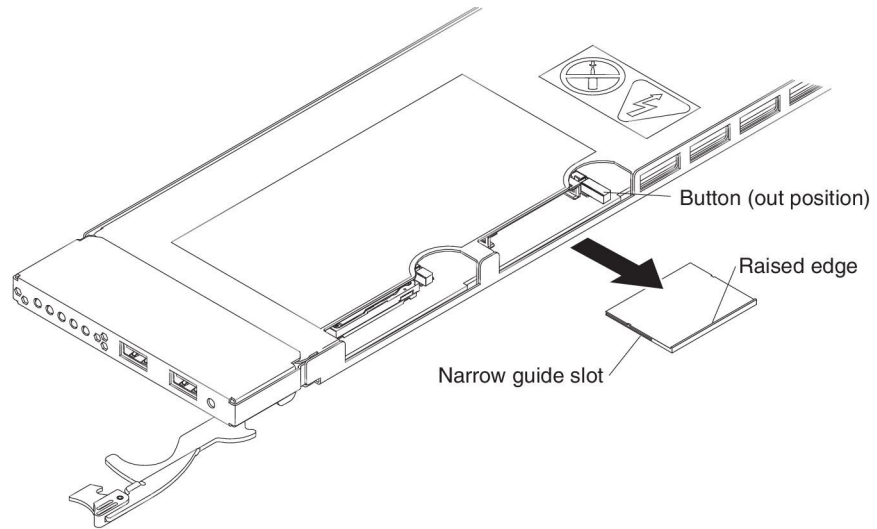
1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull the media tray release handle to the open position. The media tray moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the media tray out of the bay.

## Removing a CompactFlash module

To remove a CompactFlash module, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull out the media tray from the BladeCenter HT unit so that the CompactFlash connectors are accessible (see “Removing a media tray”).



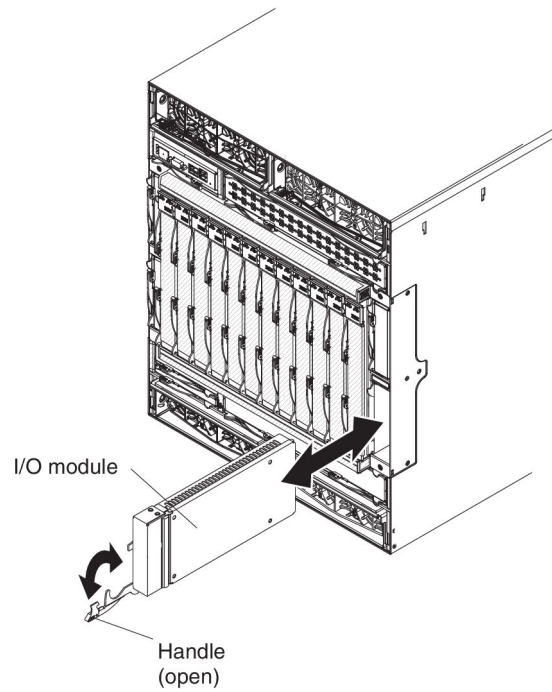
3. Press the release button next to the CompactFlash module that you are removing. The release button extends from the media tray.
4. Press the release button again to eject the CompactFlash module from the media tray.

**Note:** If the release button for a CompactFlash module is in the out position, press the release button to the in position before installing the media tray into the BladeCenter HT unit.



## Removing an I/O module

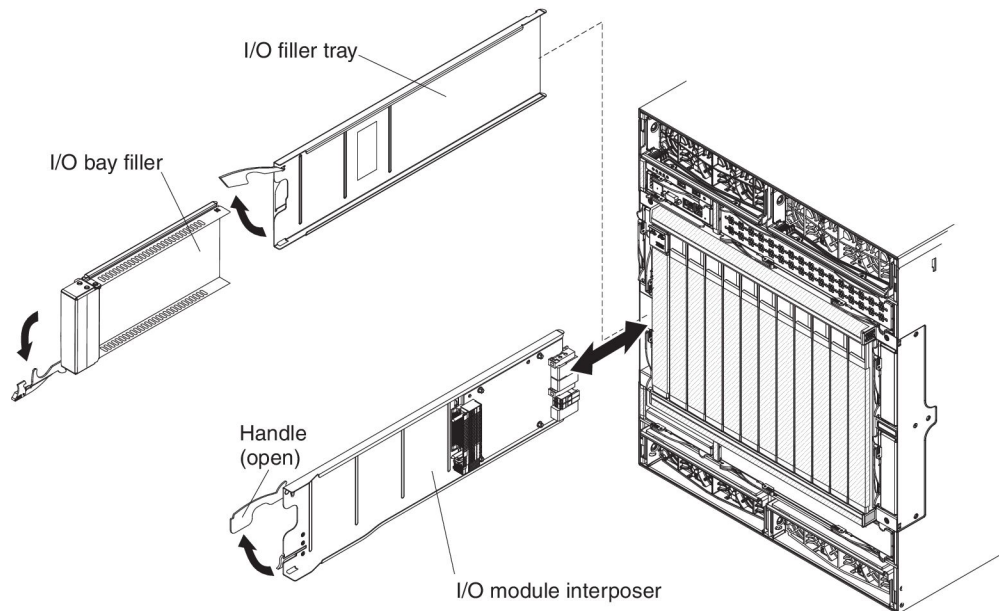
To remove an I/O module or module filler, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull the release handle to the open position. The module moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the module out of the bay.

## Removing an I/O-module interposer

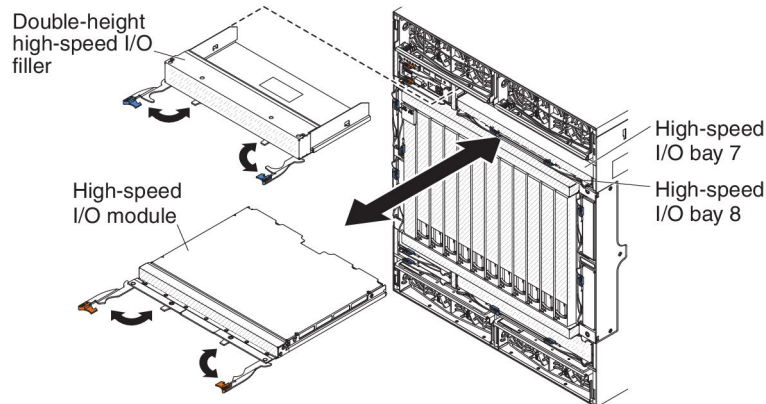
To remove an I/O-module interposer or tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the I/O module or filler from the I/O-module bay (see “Removing an I/O module” on page 33).
3. Pull the interposer release handle to the open position. The interposer moves out of the bay approximately 0.6 cm (0.25 inch).
4. Slide the interposer out of the bay.

## Removing a high-speed I/O module

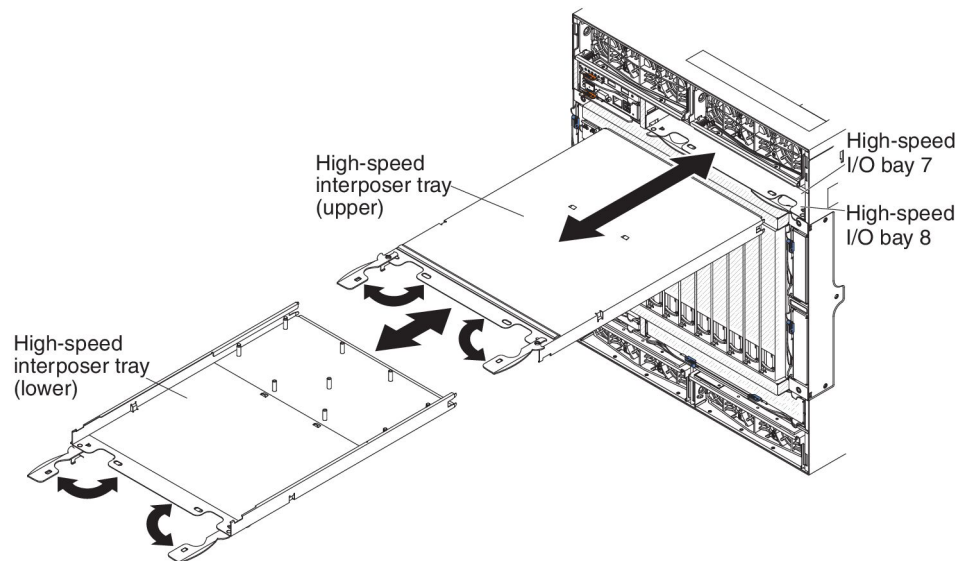
To remove a high-speed switch module or module filler, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull the module release handles to the open position. The module moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the module out of the bay.

## Removing a high-speed I/O-module interposer tray

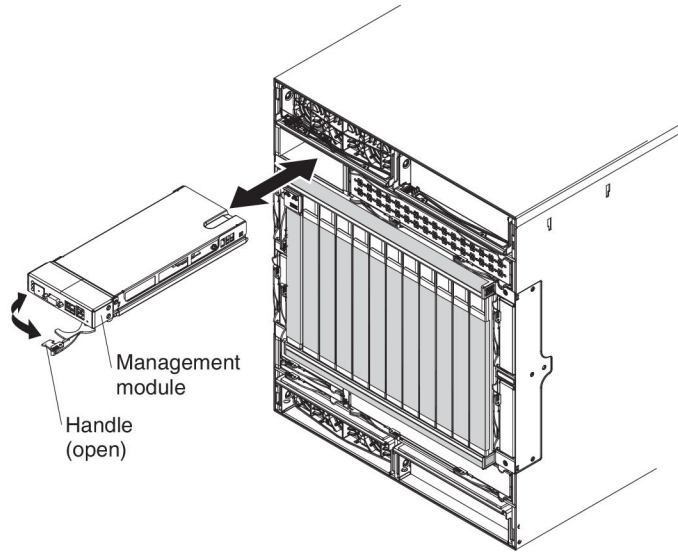
To remove an I/O-module interposer or interposer-filler tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the high-speed I/O module or filler from the high-speed I/O-module bay (see “Removing a high-speed I/O module”).
3. Pull the interposer-tray release handles to the open position. The interposer moves out of the bay approximately 0.6 cm (0.25 inch).
4. Slide the interposer out of the bay.

## Removing a management module

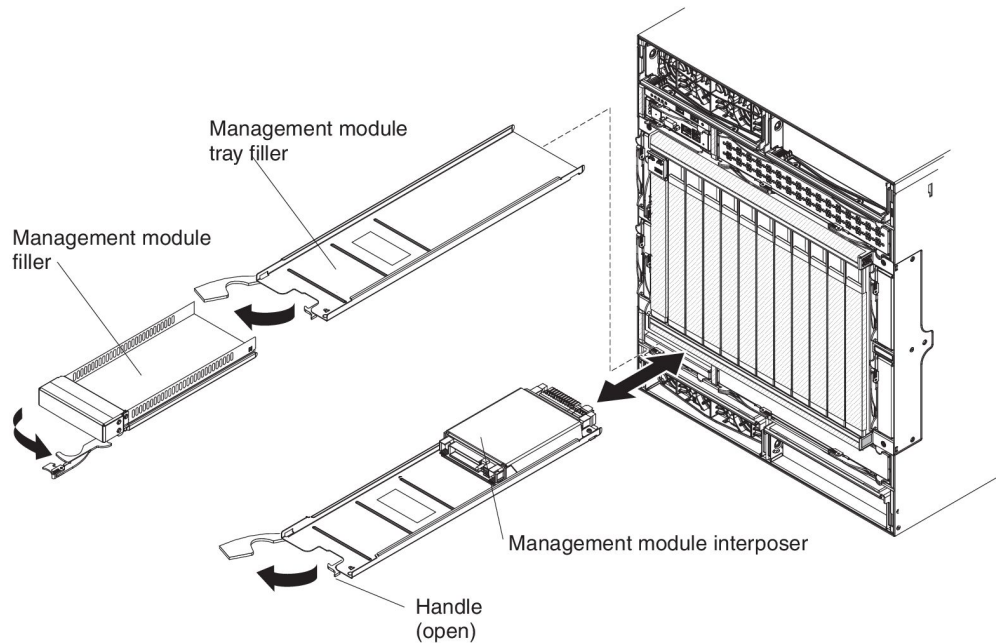
To remove a management module or module filler, complete the following steps.



1. Read the safety information that begins on page vii and "Installation guidelines" on page 26.
2. Pull the module release handle to the open position. The module moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the module out of the bay.

## Removing a management-module interposer

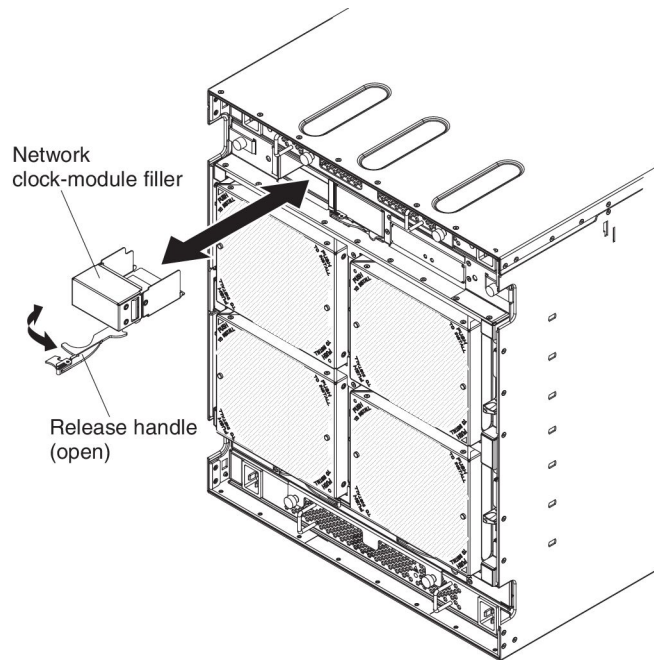
To remove a management-module interposer or interposer-filler tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the management module or filler from the management-module bay (see “Removing a management module” on page 36).
3. Pull the management-module interposer or filler tray release handle to the open position. The interposer moves out of the bay approximately 0.6 cm (0.25 inch).
4. Slide the interposer out of the bay.

## Removing a network clock filler

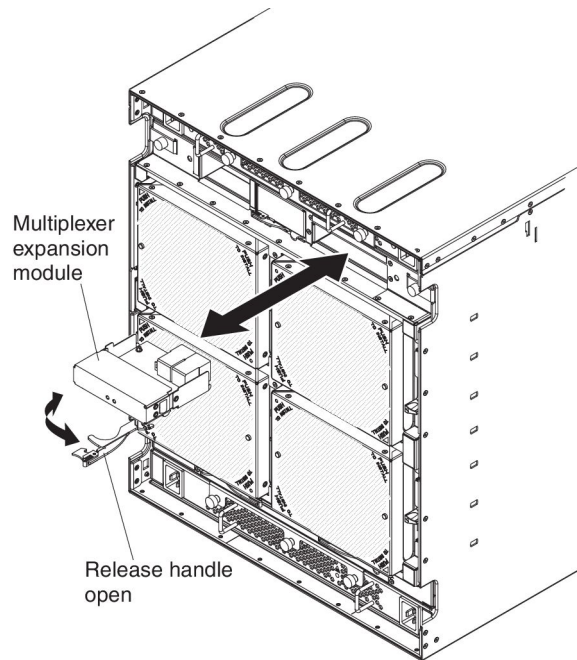
To remove a network clock filler, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull the release handle to the open position. The filler moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the filler out of the bay.

## Removing a multiplexer expansion module

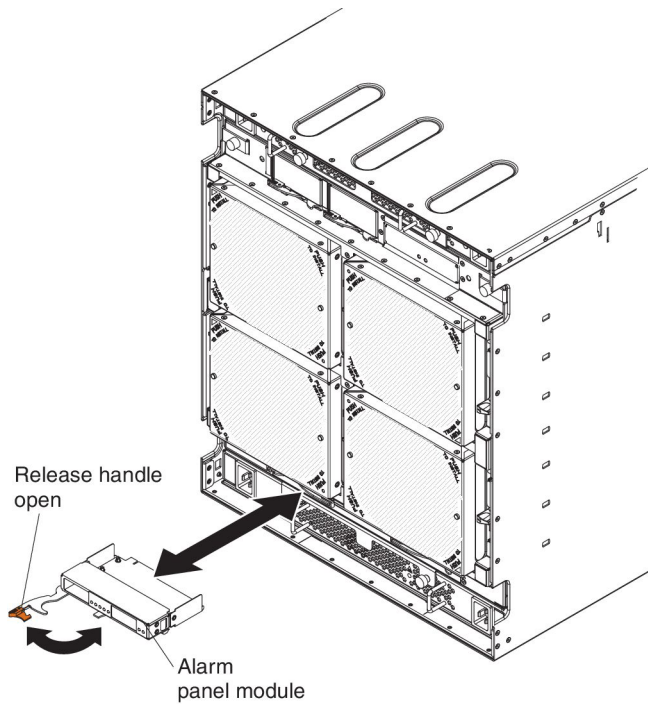
To remove a multiplexer expansion module, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull the release handle to the open position. The module moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the module out of the bay.

## Removing an alarm panel module

To remove an alarm panel module or module filler, complete the following steps.

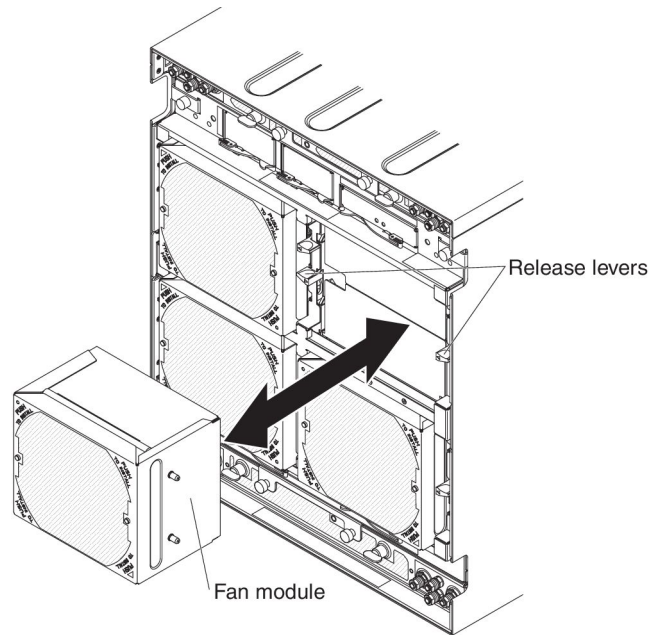


1. Read the safety information that begins on page vii and "Installation guidelines" on page 26.
2. Pull the release handle to the open position. The module moves out of the bay approximately 0.6 cm (0.25 inch).
3. Slide the module out of the bay.

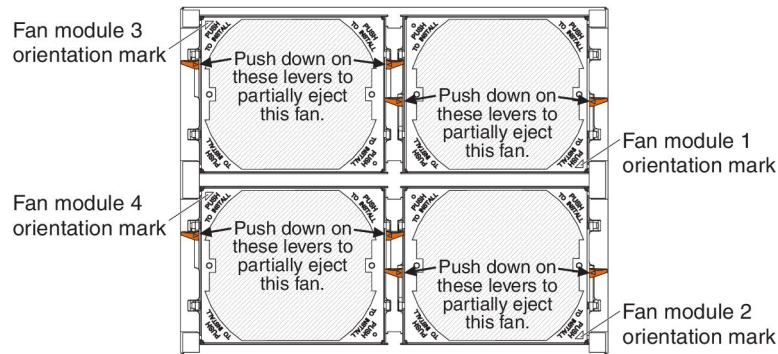


## Removing a fan module

To remove a fan module, complete the following steps.



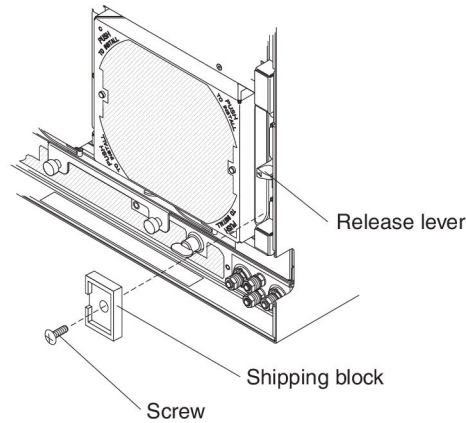
1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.



**Attention:** While the BladeCenter HT is operating, only one fan module should be removed at a time. Removing two fan modules might cause the BladeCenter HT unit to overheat.

2. If a shipping block is installed below the release levers, complete the following steps:

**Note:** When the BladeCenter HT unit is shipped, each fan module has a shipping block installed below the release lever that is on the same side as the fan module orientation mark.



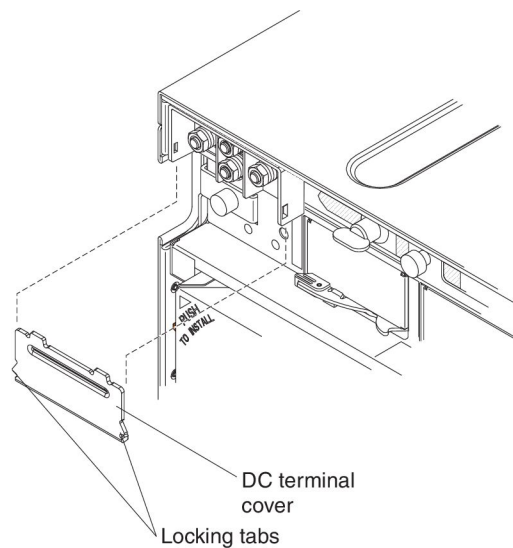
- a. Remove the phillips-head screw that attaches the shipping block to the BladeCenter HT unit.
- b. Pull the shipping block away from the BladeCenter HT unit. Place the shipping block and screw in a safe place.

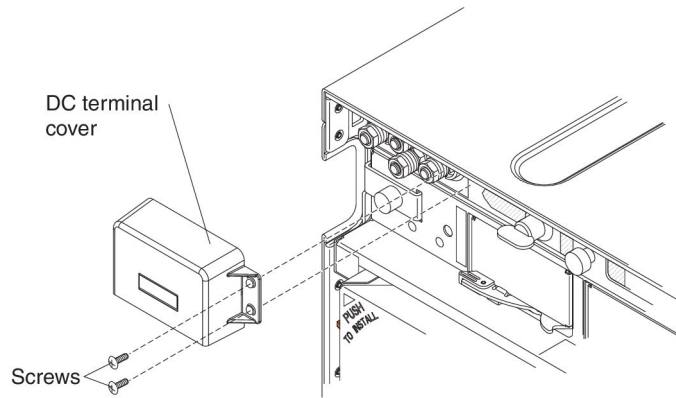
**Note:** When the BladeCenter HT unit is shipped, a shipping block must be installed for each fan module. The shipping block is installed below the release lever that is on the same side as the fan module orientation mark.

3. Press down on the release levers on either side of the fan module you are removing. The module moves out of the bay approximately 0.6 cm (0.25 inch).
4. Pull the fan module out of the bay.

## Removing a dc terminal cover

There are two types of terminal covers, depending on the date of manufacture. The following illustrations show both types of terminal covers.





To remove a dc terminal cover from an IBM BladeCenter HT type 8740, complete the following steps.

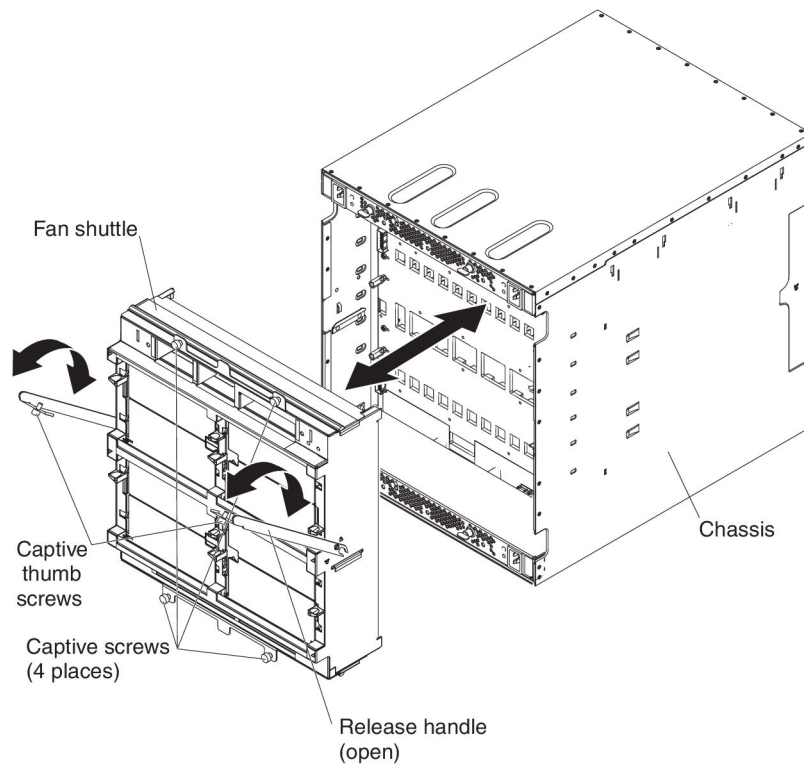
1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Shut down each blade server. See the documentation that comes with your blade servers for the procedure for shutting down the operating system.
3. Turn off the power source.

**Note:** After you disconnect the BladeCenter HT unit from power, wait at least 5 seconds before you connect the BladeCenter HT unit to power again.

4. If your terminal cover is attached to the dc power box with two phillips-head screws, remove the screws.
5. Pull the terminal cover away from the BladeCenter HT unit.

## Removing the fan shuttle

To remove the shuttle, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Shut down the operating systems and turn off any blade servers in the BladeCenter HT unit. See the documentation that comes with the blade server for detailed instructions.
3. If the BladeCenter HT unit is connected to a power source, disconnect the power from the BladeCenter HT unit and remove the power cables (see “Disconnecting power from the BladeCenter HT unit” on page 16).
4. Disconnect the cables from the modules in the rear of BladeCenter HT unit.
5. Remove any of the following modules that are installed in the rear of the BladeCenter HT unit:
  - Fan modules (see “Removing a fan module” on page 41).
  - Network clock fillers (see “Removing a network clock filler” on page 38).
  - Multiplexer expansion modules (see “Removing a multiplexer expansion module” on page 39).
  - Alarm panel module (see “Removing an alarm panel module” on page 40).
6. Loosen the four captive thumb screws on the fan shuttle.
7. Loosen the captive thumbscrews on the release handles, and pull the handles to the open position. The fan shuttle moves out of the BladeCenter HT chassis approximately 1.3 cm (0.5 inch).

**Attention:** Use your hands to hold the frame of the fan shuttle where the fan-module bays are located. Do not use the release handles to hold the fan shuttle.
8. While you support the fan shuttle with your hands, pull the fan shuttle out of the BladeCenter HT chassis.

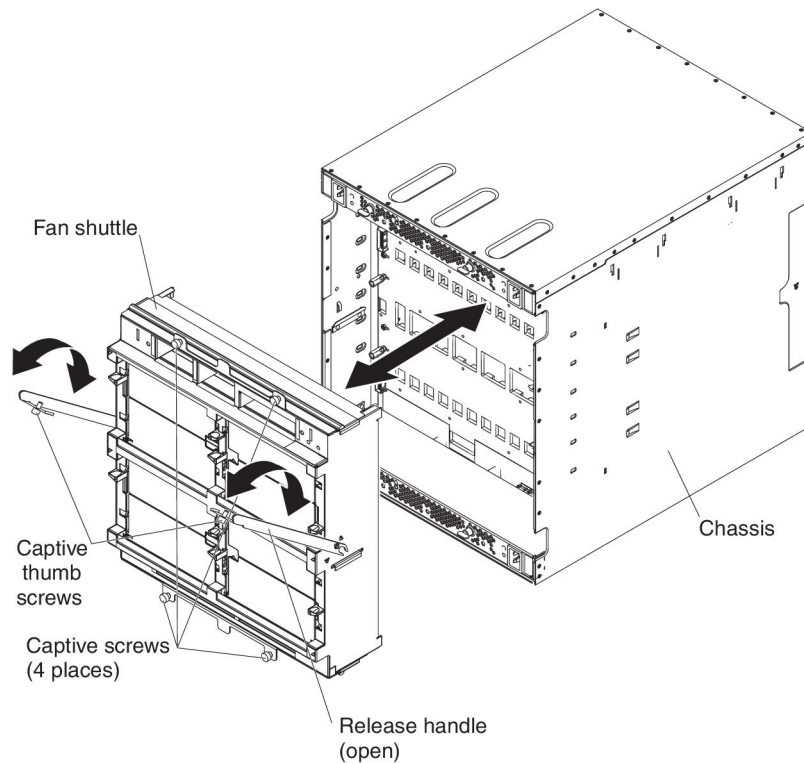
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## Installing components into a BladeCenter HT unit

The following procedures are for reinstalling components or installing optional devices in the BladeCenter HT unit after the rack installation is complete.

## Installing the fan shuttle

To install the shuttle, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.

2. Make sure that no modules are installed in the fan shuttle and the release handles on the shuttle are in the open position.

**Attention:** Use your hands to hold the frame of the fan shuttle where the fan-module bays are located. Do not use the release handles to hold the fan shuttle.

3. Orient the fan shuttle so that fan-module bays 1 and 3 are above fan-module bays 2 and 4 (see “Rear view” on page 21).

4. Align the shuttle with the BladeCenter HT chassis and push the shuttle into the chassis until it stops.

5. Push the release handles to the closed position. The shuttle moves back fully into the BladeCenter HT chassis.

6. Tighten the four captive thumbscrews on the fan shuttle.

7. Tighten the captive thumbscrew on each release handle.

**Important:** The release handles have a safety switch that disables power output from the power boxes. If the release handles are not secured to the chassis with the thumbscrews, the BladeCenter HT unit will not power on.

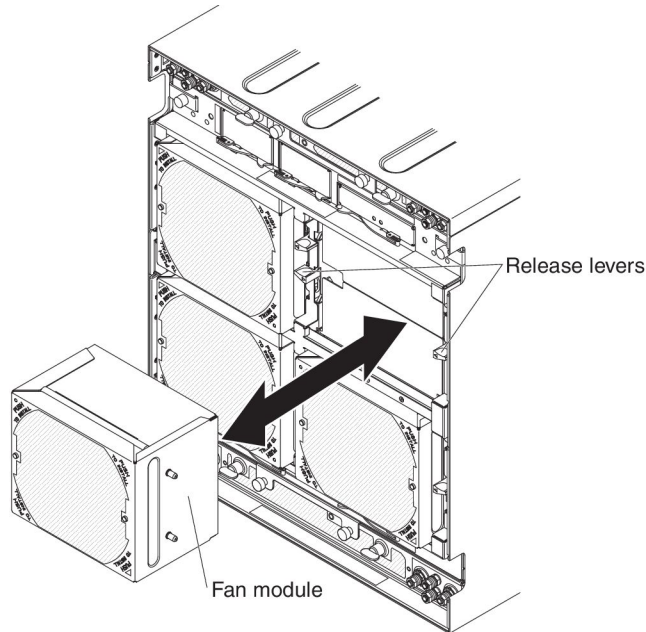
8. Install any of the following modules that you removed from the rear of the BladeCenter HT unit:

- Fan modules (see “Installing a fan module” on page 46).
- Network clock fillers (see “Installing a network clock filler” on page 47).
- Multiplexer expansion modules (see “Installing a multiplexer expansion module” on page 48).
- Alarm panel module (see “Installing an alarm panel module” on page 49).

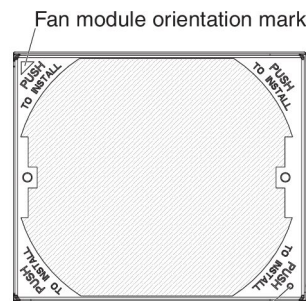
9. Reconnect any cables that you disconnected from the modules in the rear of the BladeCenter HT unit.
10. Reconnect the power to the BladeCenter HT unit (see “Supplying power to the BladeCenter HT unit” on page 13).
11. Restart any blade servers that were shut down in the BladeCenter HT unit. See the documentation that comes with each blade server for detailed instructions.

## Installing a fan module

To install a fan module, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Orient the fan module to the selected fan-module bay.



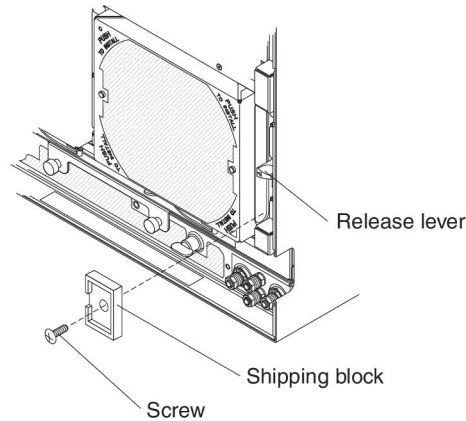
Fan module fault LED

- a. If you are installing a fan module in fan-module bay 1 or 2, orient the fan so the orientation mark is at the bottom-right corner.
- b. If you are installing a fan module in fan-module bay 3 or 4, orient the fan so the orientation mark is at the top-left corner.
3. Slide the module into the bay until it stops.

**Note:** Make sure the release levers for the fan module return to a locked position.

4. If you are shipping the BladeCenter HT unit to another location, install the shipping block that came with the BladeCenter HT unit.

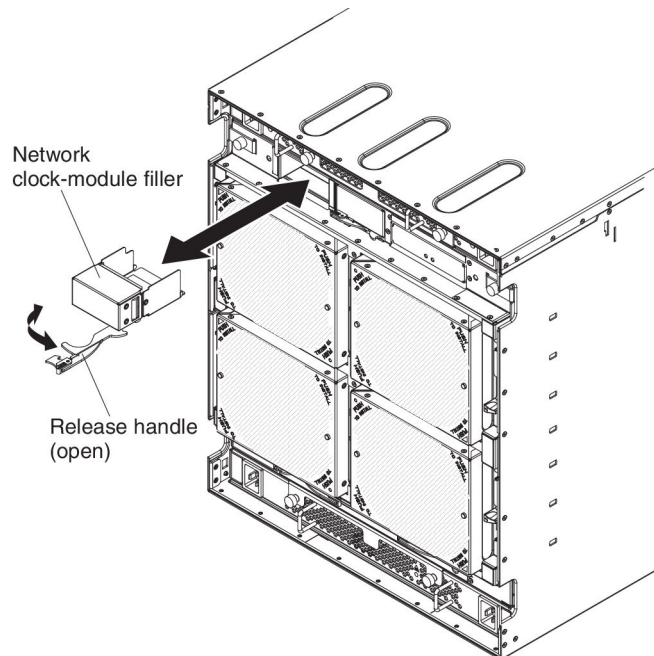
**Note:** When the BladeCenter HT unit is shipped, a shipping block must be installed for each fan module. The shipping block is installed below the release lever that is on the same side as the fan module orientation mark.



- a. Orient the shipping block below the release lever on the same side as the orientation mark on the fan module.
- b. Push the shipping block into the slot below the release lever.
- c. Install the phillips-head screw that attaches the shipping block to the BladeCenter HT unit.

## Installing a network clock filler

To install a network clock filler, complete the following steps.

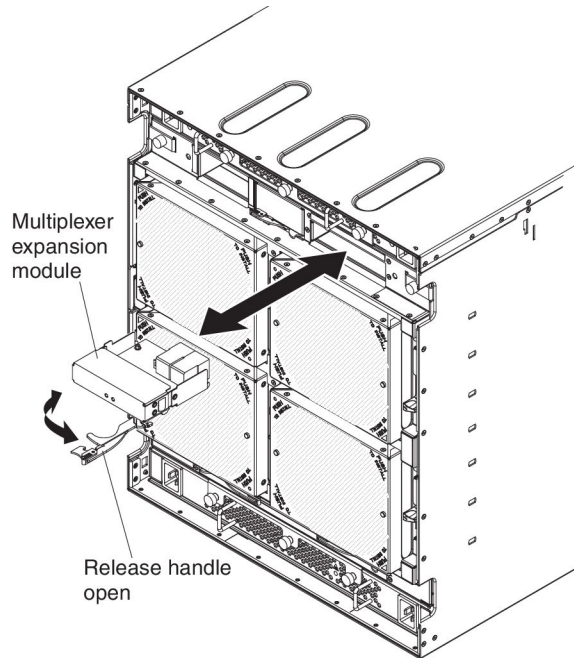


1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Make sure that the release handle on the filler is in the open position.

3. Slide the filler into the module bay until it stops.
4. Push the release handle to the closed position.

## Installing a multiplexer expansion module

To install a multiplexer expansion module or module filler, complete the following steps.

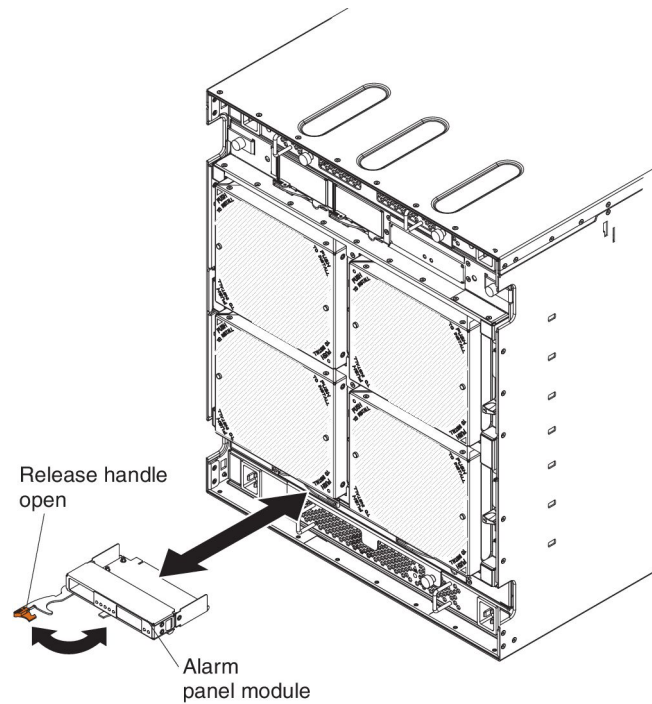


1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Make sure that the release handle on the module is in the open position.
3. Slide the module into the module bay until it stops.
4. Push the release handle to the closed position.



## Installing an alarm panel module

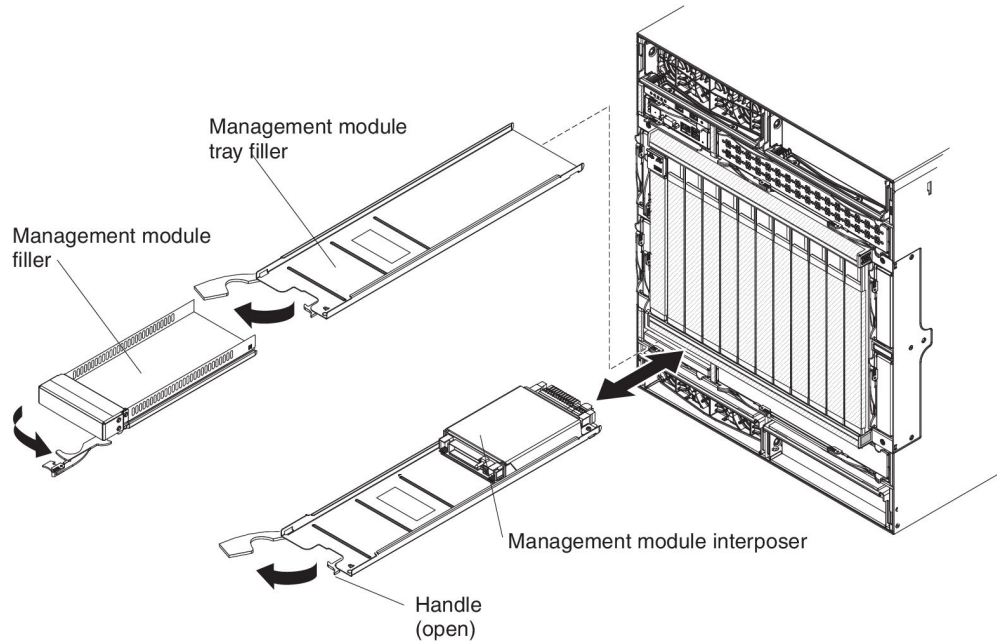
To install an alarm panel module or module filler, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Make sure that the release handle on the module is in the open position.
3. Slide the module into the module bay until it stops.
4. Push the release handle to the closed position.

## Installing a management-module interposer

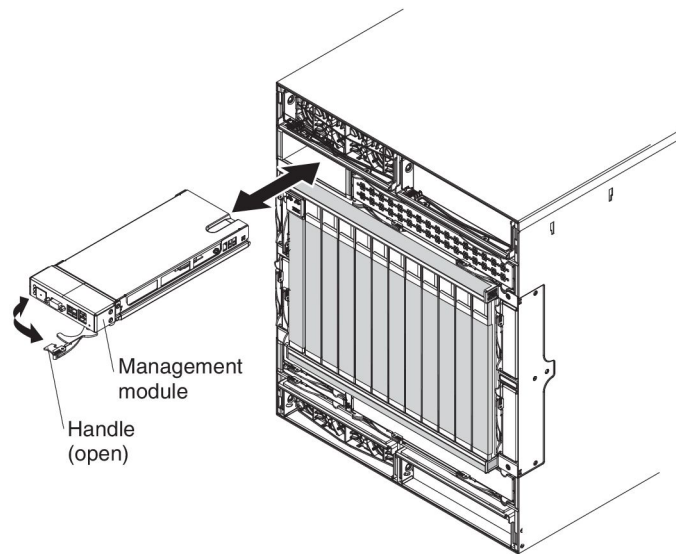
To install a management-module interposer or filler tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the management module filler and management module tray filler (see “Removing a management module” on page 36 and “Removing a management-module interposer” on page 37).
3. Make sure that the release handle on the interposer is in the open position.
4. Slide the interposer into the module bay until it stops.
5. Push the interposer release handle to the closed position.
6. Install a management module or filler (see “Installing a management module” on page 51).

## Installing a management module

To install a management module, complete the following steps.

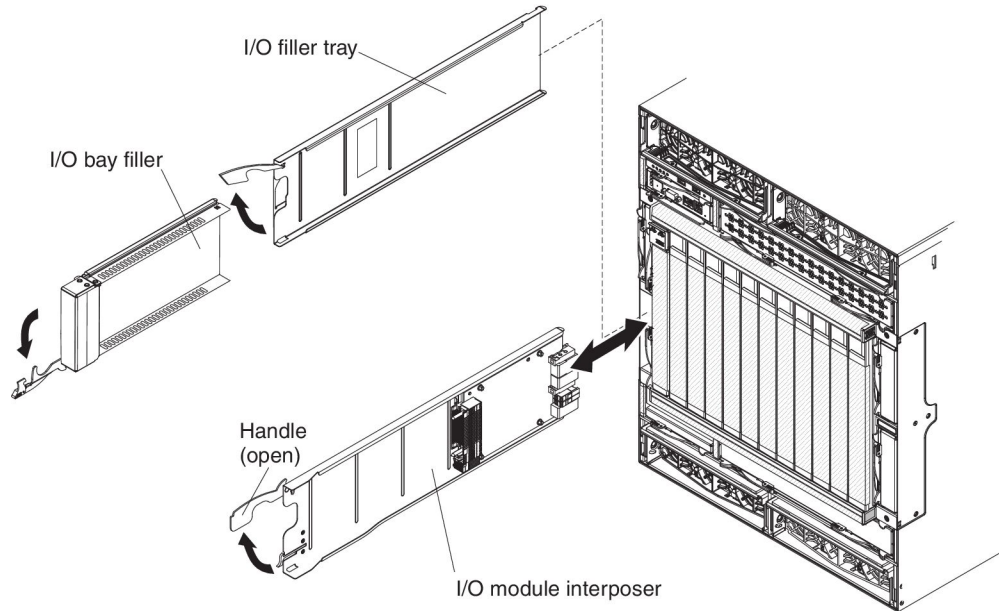


1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the management-module filler, if one is installed (see “Removing a management module” on page 36).
3. Remove the management module-interposer filler tray, if one is installed (see “Removing a management-module interposer” on page 37).
4. Install the management module interposer, if it is not already installed (see “Installing a management-module interposer” on page 50).
5. Make sure that the release handle on the module is in the open position.
6. Slide the module into the module bay until it stops.
7. Push the module release handle to the closed position.
8. Connect any cables to the module.
9. If the BladeCenter HT unit is connected to power, make sure that the OK LED on the module is lit. If the management module is redundant, wait at least 45 minutes for the modules to copy the configuration data before making any changes to the management module configuration.

## Installing an I/O-module interposer

**Note:** Before you install a new I/O-module interposer, read the documentation that comes with the interposer for detailed instructions.

To install an I/O-module interposer, complete the following steps.



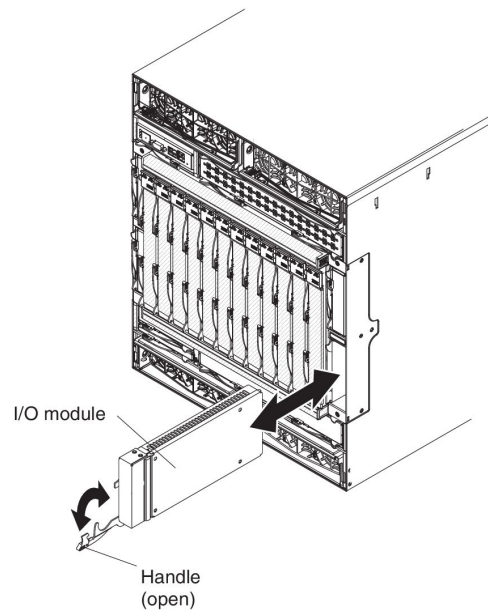
1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the module filler and filler tray, if one is installed (see “Removing an I/O module” on page 33 and “Removing an I/O-module interposer” on page 34).
3. Make sure that the release handle is in the open position.
4. Slide the module into the module bay until it stops.
5. Push the interposer release handle to the closed position.
6. Install an I/O module or filler (see “Installing an I/O module” on page 53).

## Installing an I/O module

The BladeCenter HT unit has 4 hot-swap I/O-module bays that are compatible with three types of I/O modules (see “BladeCenter HT components and LEDs” on page 18 for the location of the I/O-module bays). Each I/O module requires an I/O-module interposer to be installed first.

**Note:** Before you install a new I/O module, read the documentation that comes with the module for detailed instructions.

To install an I/O module, complete the following steps.

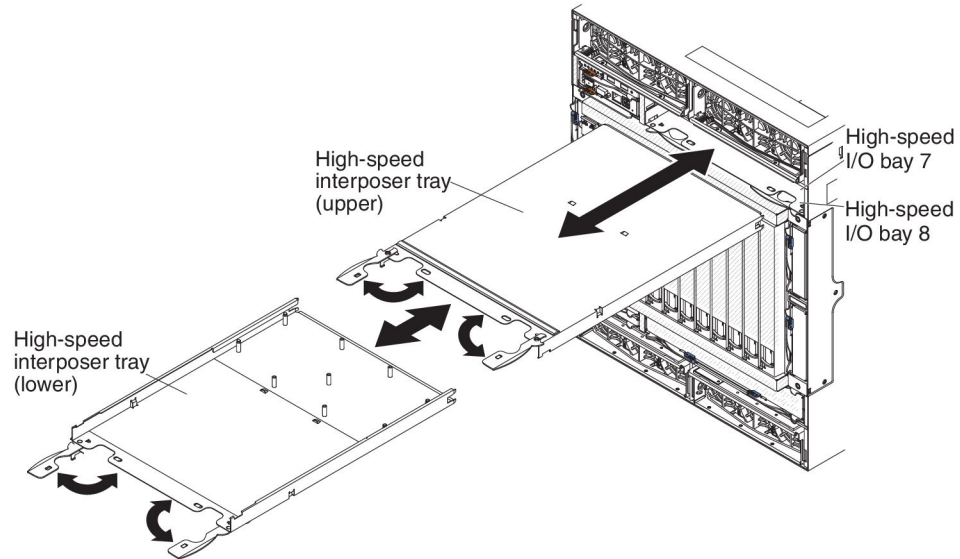


1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the module filler, if one is installed (see “Removing an I/O module” on page 33).
3. If not already installed, install an I/O-module interposer (see “Installing an I/O-module interposer” on page 52).
4. Make sure that the release handle is in the open position.
5. Slide the module into the module bay until it stops.
6. Push the module release handle to the closed position.
7. Connect the cables to the module.

## Installing a high-speed I/O-module interposer tray

**Note:** Before you install a new high-speed I/O-module interposer, read the documentation that comes with the interposer for detailed instructions.

To install a high-speed I/O-module interposer or tray, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the high-speed module or filler, if one is installed (see “Removing a high-speed I/O module” on page 35).
3. Make sure that the release handles are in the open position.
4. Slide the interposer into the module bay until it stops.
5. Push the interposer-tray release handles to the closed position.
6. Install an I/O module or filler (see “Installing a high-speed I/O module” on page 55).

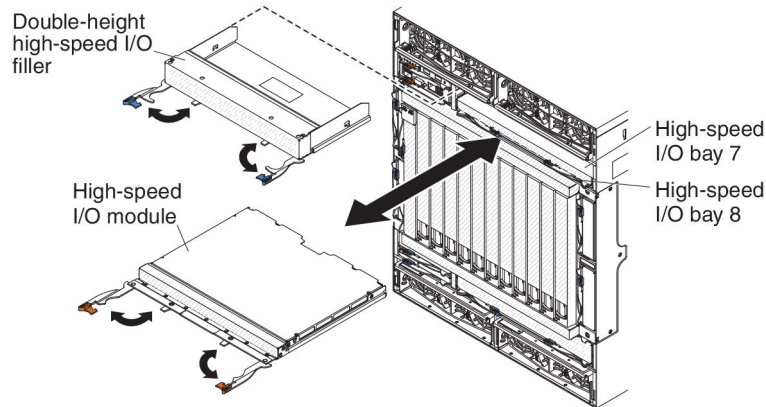
## Installing a high-speed I/O module

The BladeCenter HT unit has 4 hot-swap high-speed I/O-module bays (see “Major components of the BladeCenter HT Type 8740 and 8750 unit” on page 11 for the location of the I/O-module bays). Each high-speed I/O module requires a high-speed I/O-module interposer to be installed first.

### Notes:

1. Before you install a new high-speed I/O module, read the documentation that comes with the module for detailed instructions.
2. Power modules must be present in all four power bays.

To install a high-speed I/O module or filler, complete the following steps.



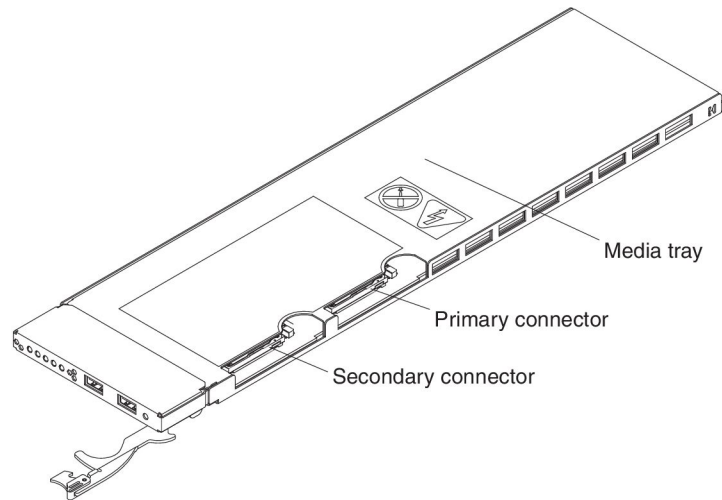
1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the module filler, if one is installed.
3. If not already installed, install a high-speed I/O-module interposer (see “Installing a high-speed I/O-module interposer tray” on page 54).
4. Make sure that the release handles are in the open position.
5. Slide the module or filler into the module bay until it stops.

### Notes:

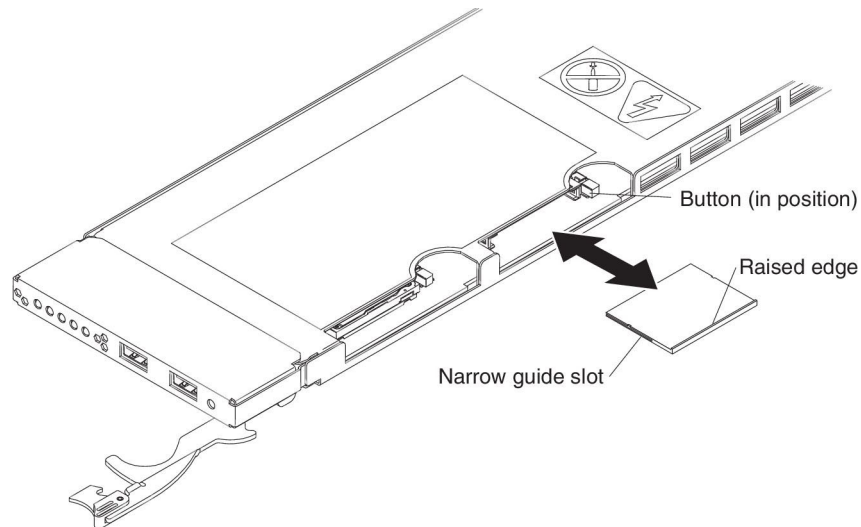
- a. If no high-speed I/O modules are installed in high-speed I/O bays 7 and 8, install a double-height high-speed I/O filler into high-speed I/O bays 7 and 8.
  - b. If no high-speed I/O modules are installed in high-speed I/O bays 9 and 10, install a double-height high-speed I/O filler into high-speed I/O bays 9 and 10.
  - c. If a high-speed I/O module is installed in high-speed I/O bay 7, install a single-height high-speed I/O filler or another high-speed I/O module into high-speed I/O bay 8.
  - d. If a high-speed I/O module is installed in high-speed I/O bay 9, install a single-height high-speed I/O filler or another high-speed I/O module into high-speed I/O bay 10.
6. Push the module release handles to the closed position.
  7. Connect the cables to the module.

## Installing a CompactFlash module

To install a CompactFlash module, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Pull out the media tray from the BladeCenter HT unit so that the CompactFlash connectors are accessible (see “Removing a media tray” on page 31).
3. If you are replacing a CompactFlash module that is already installed, remove it (see “Removing a CompactFlash module” on page 31).



4. Make sure the CompactFlash release buttons are pushed in.
5. Insert the CompactFlash module into the primary or secondary connector on the media tray.

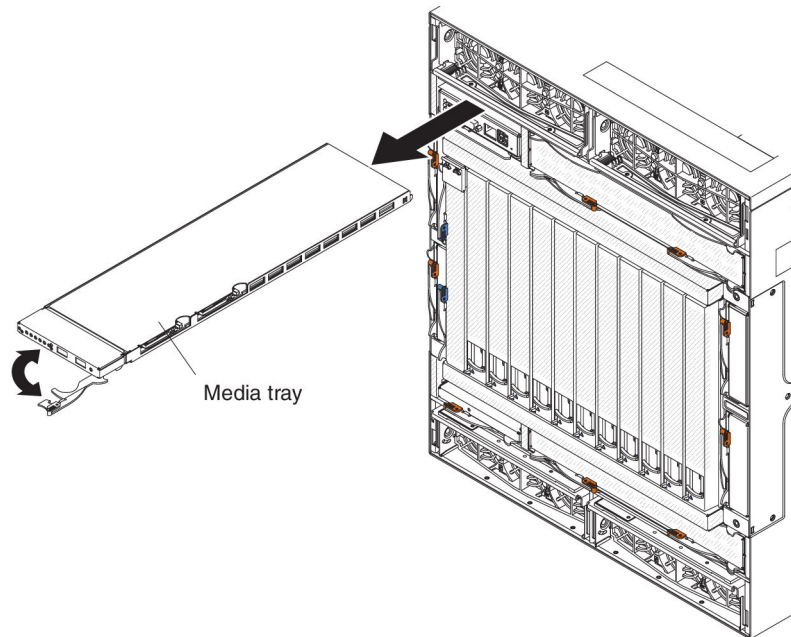
**Note:** The sides of the CompactFlash module have guide slots. Insert the CompactFlash module with the narrow guide slot positioned toward the front of the media tray.

6. Install the media tray into the BladeCenter HT unit (see “Installing a media tray” on page 57).

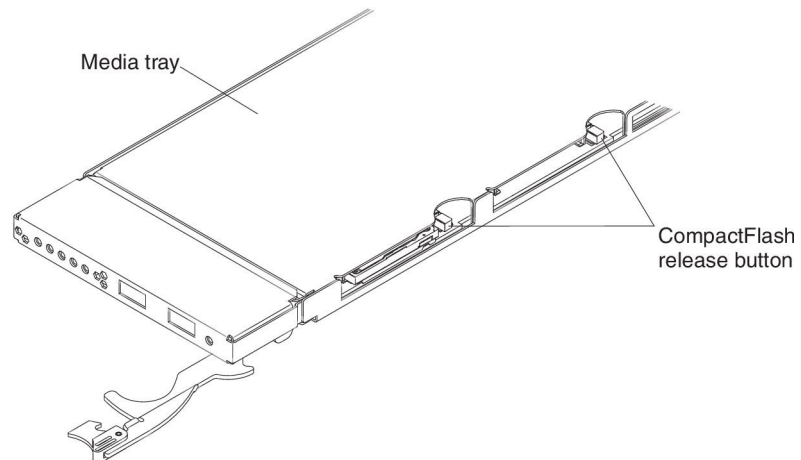


## Installing a media tray

To install a media tray, complete the following steps.



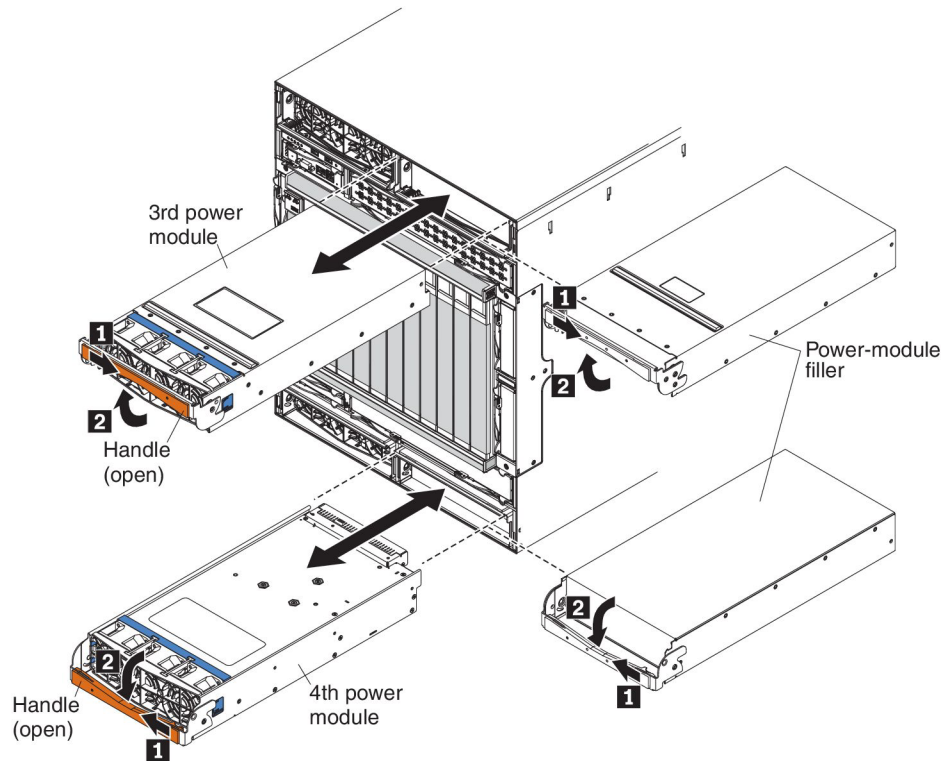
1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Make sure that the media tray release lever is in the open position and the CompactFlash release buttons are pushed into the in position.



3. Slide the media tray into position until it stops and locks into place.
4. Rotate the media tray release lever to the closed position.

## Installing a power module

To install a power module, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Remove the module filler, if one is installed (see “Removing a power module” on page 29).
3. Make sure that the handle on the power module is in the open position.
4. Orient the new power module to the selected power-module bay:
  - For the upper power-module bays, the rear connector on the power module must be facing down.
  - For the lower power-module bays, the rear connector on the power module must be facing up.

## Installing a blade server

### Statement 21:

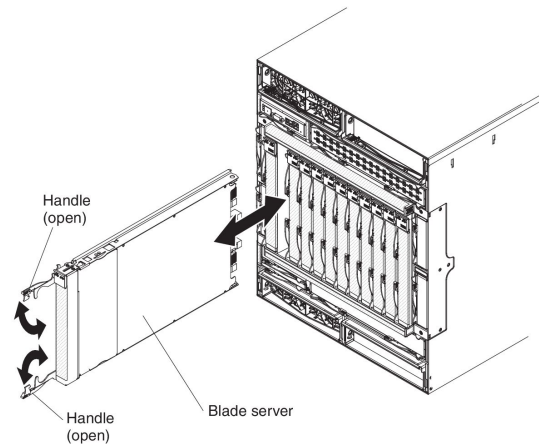


#### CAUTION:

**Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.**

**Attention:** If this is the initial installation of a blade server in the BladeCenter HT unit, you must configure the blade server by using the blade server Configuration/Setup Utility program and install the blade server operating system. See the documentation that comes with the blade server for instructions.

To install a blade server, complete the following steps.



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Select the bay for the blade server.

#### Notes:

- a. Depending on the blade-server type and the optional devices that are installed in it, one or more adjacent bays might be required.
  - b. When any blade server or device is in any blade bay 7 through 12, power modules must be installed in all four power bays.
3. Remove the filler from the bay, if one is installed (see “Removing a blade server” on page 30).

**Attention:** To help ensure proper cooling, performance, and system reliability, do not operate the BladeCenter HT unit for more than 1 minute without either a blade server or a blade filler installed in each blade bay.

4. Make sure that the two release handles are in the open position.
5. Slide the blade server into the bay until it stops.
6. Push the two release handles to the closed position.
7. Make sure that the blade server is receiving power. See the documentation that comes with the blade server for instructions.
8. If you are installing a new blade server, write identifying information on one of the user labels that come with the blade server; then, place the label on the

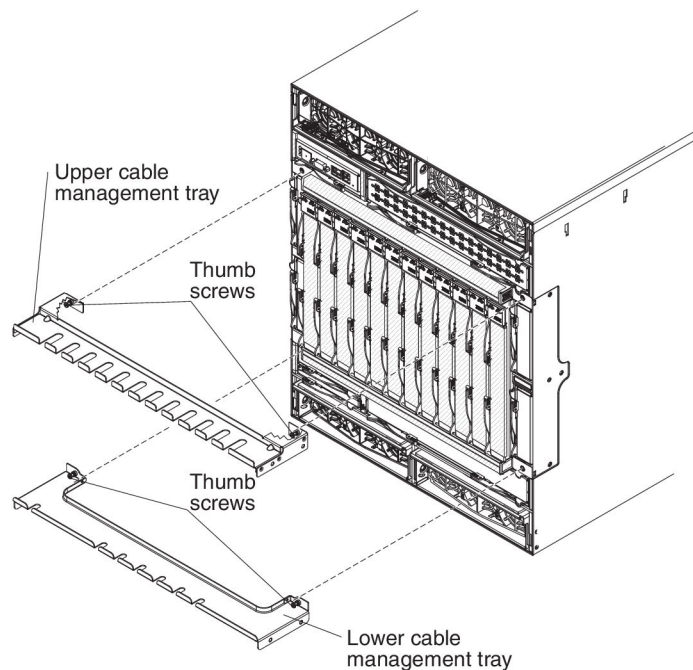
BladeCenter HT unit top bezel, just above the blade server (see “Locating and recording BladeCenter HT unit information” on page 2).

**Important:** Do not place the label on the blade server or in any way block the ventilation holes on the BladeCenter HT unit bezel.

## Installing the cable management trays without a bezel

The cable management trays can be installed with or without the BladeCenter HT bezel option. If installing the BladeCenter HT bezel, see the *IBM BladeCenter HT Bezel Installation Instructions* that comes with the BladeCenter HT bezel for more information.

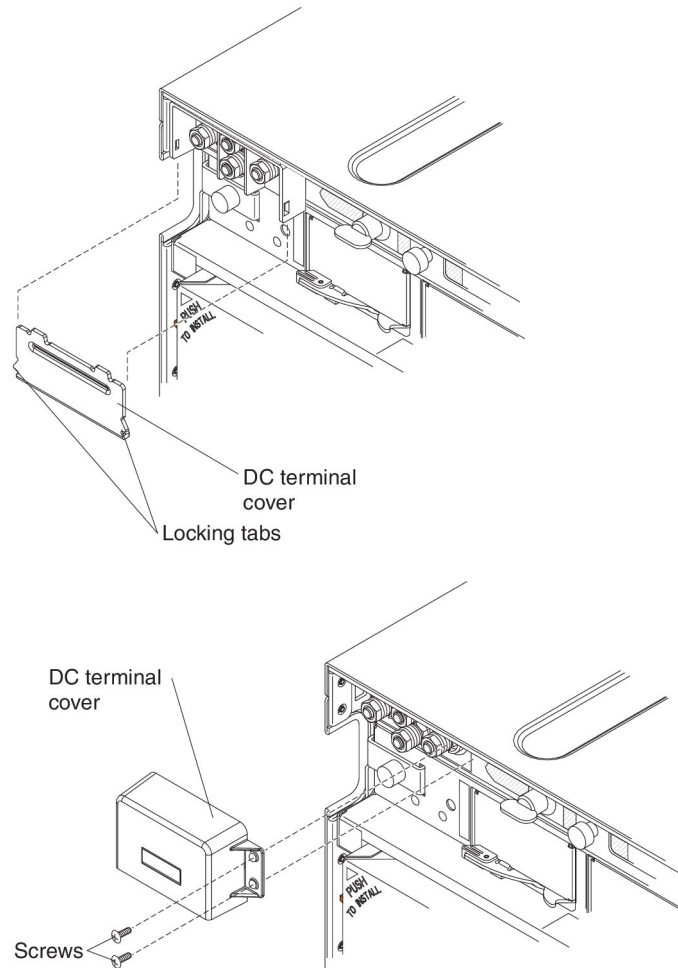
To install a cable management tray without a bezel, complete the following steps:



1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. To install the upper cable management tray on the BladeCenter HT, complete the following steps:
  - a. Orient the upper cable management tray so that the captive thumb screws are oriented towards the blade-server bays.
  - b. Align the captive thumb screws with the screw holes above I/O-module bays 1 and 3.
  - c. Use a phillips-head screwdriver to screw the captured thumb screws into the BladeCenter HT unit.
3. To install the lower cable management tray on the BladeCenter HT, complete the following steps:
  - a. Orient the lower cable management tray so that the captive thumb screws are oriented towards the blade-server bays.
  - b. Align the captive thumb screws with the screw holes below I/O-module bays 2 and 4.
  - c. Use a phillips-head screwdriver to screw the captured thumb screws into the BladeCenter HT unit.

## Installing a dc terminal cover

There are two types of terminal covers, depending on the date of manufacture. The following illustrations show both types of terminal covers.



To install a dc terminal cover on an IBM BladeCenter HT type 8740, complete the following steps.

1. Read the safety information that begins on page vii and “Installation guidelines” on page 26.
2. Make sure power has been disconnected from the BladeCenter HT unit. See “Disconnecting power from the BladeCenter HT unit” on page 16 for more information.
3. Turn off the power source.

**Note:** After you disconnect the BladeCenter HT unit from power, wait at least 5 seconds before you connect the BladeCenter HT unit to power again.

4. If your terminal cover has screw holes, orient the terminal cover so that it fits over the dc power terminals and the screw holes on the terminal cover are aligned with the screw holes on the dc power box. Install the two phillips-head screws that attach the terminal cover to the power box.
5. If your terminal cover does not have screw holes, snap the cover into place so that the locking tabs go into the slots on the side of the power terminals.

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## Completing the installation

After you connect the cables to the modules and route the cables (see the cable routing instructions that come with the rack, if necessary), complete the following steps to start the BladeCenter HT unit and verify that it is working correctly:

1. Supply power to the BladeCenter HT unit (see “Supplying power to the BladeCenter HT unit” on page 13).
2. Make sure that the following LEDs are lit and indicate that the device is working correctly.
  - Input power and output power LEDs on each power module
  - OK LED on each management module
  - OK LED on each I/O module
3. Make sure that the power-on LED on each blade server is lit, either steady or flashing slowly. See the documentation that comes with the blade servers for the locations of the LEDs on the blade servers.
4. Make sure there are no fault or error LEDs lit on any of the modules. See “BladeCenter HT components and LEDs” on page 18 for information about the locations of the LEDs on the modules.

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## Chapter 4. Configuration and networking guidelines

The BladeCenter HT components are configured and managed through a management module. You can configure the management module and the BladeCenter HT unit components through a local or remote connection and management-module user interfaces or other system management tools. See your management-module documentation for instructions for configuring the BladeCenter HT unit.

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### Configuring the BladeCenter HT unit

General configuration of the BladeCenter HT unit and installed components is performed through the management module. See the *BladeCenter HT Management Module User's Guide* and the *BladeCenter HT Management Module Command-Line Interface Reference Guide* for your management module for information and instructions. Some devices in the BladeCenter HT unit, such as I/O modules and blade servers, might also require additional configuration. See the documentation that comes with each device for information and instructions.

### Configuring the management module

All management modules are preconfigured with the same static IP address. You can use the management module user interface to assign a new static IP address. To establish connectivity, the management module attempts to use Dynamic Host Configuration Protocol (DHCP) to acquire its initial IP address for the management-module Ethernet port. If DHCP is not installed or is enabled and fails, the management module uses the static IP address. Use the management module to configure other BladeCenter HT component settings, such as user accounts, DHCP, or Wake on LAN. See the documentation for your management module for instructions.

### Configuring I/O modules

You must install and configure at least one external (in-band) port on an Ethernet switch module in I/O-module bay 1 or 2 to communicate with the Ethernet controllers that are integrated in each blade server. See the documentation for your management module for information about configuring external ports on I/O modules. For I/O-device settings, see the documentation that comes with your I/O device.

**Note:** If a pass-thru module is installed in I/O-module bay 1 or 2, you must configure the external network switch to which the pass-thru module is connected; see the documentation that comes with the external network switch.

### Configuring blade servers

To achieve blade server redundancy, you must configure the Ethernet controllers in one or more blade servers for failover. When failover occurs on a blade server, the secondary Ethernet controller takes over network communications, using the I/O module that is associated with that controller. Install a pair of Ethernet switches in I/O-module bays 1 and 2, and then configure them and your network infrastructure so that they can direct traffic to the same destinations. You can also install a pass-thru module that is connected to an external Ethernet switch in either or both of these I/O-module bays. See the documentation that comes with your blade server and operating system for instructions.

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## BladeCenter HT networking guidelines

Make sure the network infrastructure is configured before you connect the BladeCenter HT unit to a LAN switch or similar network device.

Each blade server has two independent Ethernet controllers, each with its own MAC address and a dedicated 1000 Mbps link to one of the switch modules in I/O-module bays 1 and 2. Switches that support Inter Switch Link (ISL) can be configured to support switch to switch traffic on up to two internal switch link interconnections between the peer switches. These ports can be configured as a trunk group between these peer switches.

**Note:** When installing a switch module that supports ISL, a switch-module interposer that also supports ISL must be installed into the same I/O bay.

The management module has a separate internal 100 Mbps link to each switch. These links are for internal management and control only. No data packets are allowed to flow from application programs on the blade servers to the management module over this path.



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## Chapter 5. IBM Director

This chapter provides information about IBM Director, a workgroup-hardware-management tool that you can use to centrally manage IBM servers.

With IBM Director, a network administrator can perform the following tasks:

- View the hardware configuration of remote systems, in detail.
- Monitor the usage and performance of critical components, such as microprocessors, disks, and memory.
- Centrally manage individual or large groups of IBM and non-IBM servers, desktop computers, workstations, and mobile computers on a variety of platforms.

IBM Director provides a comprehensive entry-level workgroup hardware manager. It includes the following key features:

- Advanced self-management capabilities for maximum system availability.
- Multiple operating-system platform support, including Microsoft Windows 2000 Server, Windows Server 2003, Windows XP Professional, AIX, i5/OS, Red Hat Linux, SUSE Linux, VMWare, and Novell NetWare. For a complete list of operating systems that support IBM Director, see the IBM Director Information Center at [http://pic.dhe.ibm.com/infocenter/director/pubs/index.jsp?topic=%2Fcom.ibm.director.main.helps.doc%2Ffqm0\\_main.html](http://pic.dhe.ibm.com/infocenter/director/pubs/index.jsp?topic=%2Fcom.ibm.director.main.helps.doc%2Ffqm0_main.html).
- Support for IBM and non-IBM servers, desktop computers, workstations, and mobile computers.
- Support for systems-management industry standards.
- Integration into leading workgroup and enterprise systems-management environments.
- Ease of use, training, and setup.

IBM Director also provides an extensible platform that supports advanced BladeCenter HT tools that are designed to reduce the total cost of managing and supporting networked systems. By deploying IBM Director, you can achieve reductions in ownership costs through the following benefits:

- Reduced downtime
- Increased productivity of IT personnel and users
- Reduced service and support costs

For more information about IBM Director, see the documentation on the *IBM Director* CD that comes with the BladeCenter HT unit, the IBM Director Information Center at [http://pic.dhe.ibm.com/infocenter/director/pubs/index.jsp?topic=%2Fcom.ibm.director.main.helps.doc%2Ffqm0\\_main.html](http://pic.dhe.ibm.com/infocenter/director/pubs/index.jsp?topic=%2Fcom.ibm.director.main.helps.doc%2Ffqm0_main.html), and the IBM Systems x Management web page at <http://www.ibm.com/systems/management/>, which presents an overview of IBM Systems Management and IBM Director.




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## Chapter 6. Shared BladeCenter HT resources

The BladeCenter HT unit provides resources that are available to most blade servers at all times, such as power modules, cooling, system-management, and network I/O modules; no user intervention is required. Some resources are selectable for use by a single blade server at a time, such as the media tray or the keyboard-video-mouse (KVM). You can select the resources for a blade server in the following ways.


**Attention:** Do not switch ownership of the media tray to another blade server while a transaction is taking place on an attached USB device, such as a USB CD-ROM drive. The data might become corrupted. Make sure that activity lights on the USB devices are not lit.

- Most blade servers have two selection buttons on the front of the blade server

CD and .

- You can use the management-module Web interface to enable or disable the selection buttons on the blade servers and change ownership of the media tray or the KVM (**Blade Tasks** → **Remote Control**).

The monitor that is attached to the management module shows the video output from the blade server that is the current owner of the KVM. When there is no actively selected video from any blade server, the video from blade server 12 is routed to the management module. While the management module is restarting, there is temporarily no current KVM owner. The video from blade server 12 is displayed on the monitor briefly until the management module uses its NVRAM values to reestablish ownership of the KVM and media tray. After that, the video from the blade server that is the current KVM owner is displayed on the monitor.

- To switch the KVM to a specific blade server, press the  button on that blade server.
- To switch the media tray to a specific blade server, press the CD button on that blade server.

The management module assigns the resource to the blade server that is requesting it.

- On a keyboard that is directly attached to the management module, you can press keyboard keys in the following sequence to switch KVM control between blade servers:

NumLock NumLock *blade\_server\_number* Enter

Where *blade\_server\_number* is the two-digit number of the blade bay in which the blade server is installed. When you use some keyboards, such as the 28L3644 (37L0888) keyboard, you must hold down the Shift key while you enter this key sequence.

**Note:** The KVM control key sequence does not change the ownership of the media tray resources.

It can take up to 20 seconds for the operating system in the switched-to blade server to recognize the media tray or the KVM. If you install Microsoft Windows 2000 on a blade server while it is not the current owner of the media tray or the KVM, the first time the blade server requests ownership after the operating system has been installed, it can take up to 1 minute for the operating system to recognize the devices (this is a one-time-only occurrence).

**Note:** The operating system in the blade server must provide USB support for the blade server to recognize and use the media tray. The BladeCenter HT unit uses USB for internal communication with these devices.

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## Chapter 7. Solving problems

This chapter provides basic troubleshooting information to help you solve some common problems that might occur while you are setting up your BladeCenter HT unit.

If you cannot locate and correct a problem by using the information in this chapter, see the *Problem Determination and Service Guide* for more information.

---

### Diagnostic tools overview

The following tools are available to help you diagnose and solve hardware-related problems:

- **Troubleshooting tables**

These tables list problem symptoms and steps to correct the problems. See “Troubleshooting tables” on page 70 for more information.

- **Diagnostic programs and error messages**

The built-in self-test (BIST) program checks the BladeCenter HT unit during startup and generates error messages if problems are found.

- **Light path diagnostic LEDs**

Use the light path diagnostic LEDs on the BladeCenter HT unit and the BladeCenter HT components to identify system errors quickly. See “Light path diagnostic LEDs” on page 74.

- **Real Time Diagnostics**

Real Time Diagnostics tests the major components of the BladeCenter HT unit, including the management modules, I/O modules, removable-media drives, and the blade servers. Real Time Diagnostics can be plugged into an existing IBM Director environment or installed without IBM Director present. For documentation and download information for Real Time Diagnostics, see <http://www.ibm.com/systems/management/>. See the *Problem Determination and Service Guide* for more information.

- **System event logs**

The management module stores system events and can be accessed through the management module user interface. See the *User's Guide* that comes with the management module for more information.

- **Service data**

The management module stores important hardware information that can be accessed through the management module user interface. See the *User's Guide* that comes with the management module for more information.

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## Troubleshooting tables

Use the troubleshooting tables to find solutions to problems that have identifiable symptoms.

**Note:** The symptoms for monitor, keyboard, and mouse apply only to the devices that are connected to the management module; they do not apply to the remote console.

See the *Problem Determination and Service Guide* for more detailed information about testing the BladeCenter HT unit. If you have run the diagnostic test programs or if running the tests does not reveal the cause of problem, call for service.

**Important:** If diagnostic error messages are displayed that are not listed in the *Problem Determination and Service Guide*, make sure that the latest level of firmware code is installed in your BladeCenter HT unit.

If you have just added a new optional device and your system is not working, complete the following steps before you use the troubleshooting tables:

1. Remove the device that you just added.
2. Run the diagnostic tests to determine whether the system is running correctly.
3. Update the firmware for the optional device
4. Reinstall the new device.

## Monitor or video problems

**Note:** These symptoms apply only to the monitor that is connected to the management module; they do not apply to the remote console.

Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, see the documentation that comes with the monitor for instructions for testing and adjusting the monitor.

<ul style="list-style-type: none"><li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li><li>• See the parts listing in the <i>BladeCenter HT Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li><li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li></ul>	
Symptom	Action
The monitor is not working	<ol style="list-style-type: none"><li>1. Make sure that:<ul style="list-style-type: none"><li>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li><li>• The monitor is connected to the active management module.</li><li>• The blade server that owns the KVM is turned on.</li><li>• The KVM is owned by a blade server that supports KVM.</li></ul></li><li>2. Reseat the monitor cable.</li><li>3. Call for service.</li></ol>

## Power problems

<ul style="list-style-type: none"><li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li><li>• See the parts listing in the <i>BladeCenter HT Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li><li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li></ul>	
Symptom	Action
The BladeCenter HT unit does not start.	<ol style="list-style-type: none"><li>1. Make sure that:<ol style="list-style-type: none"><li>a. All power cords are connected to a compatible power source and that the power sources are working (see “Supplying power to the BladeCenter HT unit” on page 13).</li><li>b. The input power and output power LEDs on the power modules are lit.</li></ol></li><li>2. If you just installed an optional device, remove it. If the BladeCenter HT unit now starts, you might have installed more devices than the power modules support. You might have to install power modules in power-module bays 3 and 4.</li><li>3. If the problem remains, see the <i>BladeCenter HT Problem Determination and Service Guide</i> for more information.</li></ol>

## Management module problems

- Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.
- See the parts listing in the *BladeCenter HT Problem Determination and Service Guide* to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).
- If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.

Symptom	Action
Cannot connect to the BladeCenter HT unit, using the Web interface or Telnet	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The network cable is connected to the Ethernet port on the active management module.</li> <li>• The network cable is not connected to the serial port on the management module.</li> <li>• The IP address or host name is correct. The default IP address is 192.168.70.125.</li> </ul> </li> <li>2. Reseat the management module. <b>Note:</b> Removing the active management module will cause an automatic failover to the redundant management module, if one is installed.</li> <li>3. Reset and reconfigure the management module (see the <i>BladeCenter HT Advanced Management Module Installation Guide</i> for more information).</li> <li>4. Call for service.</li> </ol>
Cannot connect to the BladeCenter HT unit after a switchover to the redundant management module	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The redundant management module has been installed for at least 45 minutes to receive the transfer of data from the primary management module.</li> <li>• The network cable is connected to the Ethernet port on the active (redundant) management module.</li> <li>• The network cable is not connected to the serial port on the active (redundant) management module.</li> <li>• The IP address or host name is correct.</li> </ul> </li> <li>2. Reseat the management module.</li> <li>3. Reset and reconfigure the management module (see the <i>BladeCenter HT Advanced Management Module Installation Guide</i> for more information).</li> <li>4. Call for service.</li> </ol>



## Fan module problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>BladeCenter HT Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
A fan module is always operating at full speed.	<ol style="list-style-type: none"> <li>1. Make sure that: <ul style="list-style-type: none"> <li>• The other fans are installed and working.</li> <li>• At least one management module is installed, and it is active and working.</li> </ul> </li> <li>2. Reseat the fan module.</li> <li>3. Call for service.</li> </ol>
A fan module is not working.	<ol style="list-style-type: none"> <li>1. Make sure that all power cords are connected to a compatible power source and that the power source is working (see “Supplying power to the BladeCenter HT unit” on page 13).</li> <li>2. Reseat the fan module.</li> <li>3. Call for service.</li> </ol>

## Media tray problems

<ul style="list-style-type: none"> <li>• Follow the suggested actions in the order in which they are listed in the Action column until the problem is solved.</li> <li>• See the parts listing in the <i>BladeCenter HT Problem Determination and Service Guide</i> to determine which components are customer replaceable units (CRU) and which components are field replaceable units (FRU).</li> <li>• If an action step is preceded by “(Trained service technician only),” that step must be performed only by a trained service technician.</li> </ul>	
Symptom	Action
A USB device is not recognized by any blade server.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. USB device</li> <li>b. Media tray</li> </ol> </li> <li>2. Call for service.</li> </ol>
A CompactFlash module is not recognized by the management module.	<ol style="list-style-type: none"> <li>1. Reseat the following components: <ol style="list-style-type: none"> <li>a. CompactFlash module</li> <li>b. Media tray</li> </ol> </li> <li>2. Call for service.</li> </ol>

## Light path diagnostic LEDs

Light path diagnostic LEDs are a system of LEDs on the BladeCenter HT unit and the BladeCenter HT components that can be used to diagnose system errors. If the front or rear system-error LED on the BladeCenter HT unit is lit, one or more error LEDs on the BladeCenter HT components also might be lit. These LEDs help to identify the cause of the problem.

## Diagnosing problems by using diagnostic LEDs

To identify the component that is causing the error, locate the lit error LED on that component.

The following example shows how to use the LEDs to diagnose a system error:

1. Note that the BladeCenter HT system-fault LEDs are lit on the media tray LED panel.
2. Locate the module or blade server that also has a lit error LED (see “BladeCenter HT components and LEDs” on page 18 for the locations of error LEDs; see the documentation that comes with your blade server for the locations of error LEDs on the blade server).
  - If the component is a module, replace the module.
  - If the component is a blade server on which a system-error LED is lit, follow the instructions in the documentation that comes with the blade server to isolate and correct the problem.

## Diagnostic LEDs

Use the following table to find solutions to problems that are identified by LEDs on the front and rear BladeCenter HT system LED panels.

Lit LED	Cause	Action
<b>BladeCenter HT system LED panels</b>		
Power-on	<p>When this green LED is lit, power is present in the BladeCenter HT unit. When this LED is off, the power subsystem, the ac power, or the LED has failed, or the management module is not present or not functioning.</p> <p><b>Attention:</b> If the power-on LED is off, it does not mean that no electrical current is present in the BladeCenter HT unit. The LED might be burned out. To remove all electrical current from the BladeCenter HT unit, you must disconnect all power cords from all power modules.</p>	<ol style="list-style-type: none"><li>1. Make sure that the BladeCenter HT is connected to a compatible power supply (see “Supplying power to the BladeCenter HT unit” on page 13).</li><li>2. Reseat the following components:<ol style="list-style-type: none"><li>a. Media tray</li><li>b. Management module</li><li>c. Power modules</li></ol></li><li>3. Call for service.</li></ol>
Location	<p>When this blue LED is lit, a condition has occurred in the BladeCenter HT unit that has caused the remote systems management to identify the BladeCenter HT unit as needing attention.</p>	<p>Look for any information or error LEDs on the system LED panels, the modules, and the blade servers in the BladeCenter HT unit, and see the <i>BladeCenter HT Problem Determination and Service Guide</i> for more information.</p>

Lit LED	Cause	Action
Critical system fault	When this LED is lit, the BladeCenter HT unit has a critical system fault. A critical system fault is an error or event that is detected by the system with a significant impact to the system. In this case, the system cannot continue to operate or is operating in a non-redundant power configuration or a non-redundant cooling configuration.	<ol style="list-style-type: none"> <li>1. Check the error log for messages.</li> <li>2. Look for a lit error LED on the modules and blade servers to locate a failing component: <ul style="list-style-type: none"> <li>• If the error LED is on a module, see the documentation that comes with the module.</li> <li>• If the error LED is on a blade server, see the documentation that comes with the blade server.</li> </ul> </li> </ol>
Major system fault	When this LED is lit, the BladeCenter HT unit has a major system fault. The system can continue to operate but might lose some function and performance.	<ol style="list-style-type: none"> <li>1. Check the error log for messages.</li> <li>2. Look for a lit error LED on the modules and blade servers to locate a failing component: <ul style="list-style-type: none"> <li>• If the error LED is on a module, see the documentation that comes with the module.</li> <li>• If the error LED is on a blade server, see the documentation that comes with the blade server.</li> </ul> </li> </ol>
Minor system fault	When this LED is lit, the BladeCenter HT unit has a minor system fault. The system can continue to operate, usually without noticeable loss of function or performance.	Check the error log for the messages. Check the LEDs on the BladeCenter HT unit and the blade servers to isolate the component.
Media tray fault  (This LED is only on the media tray in the front of the BladeCenter HT)	There is an error with the media tray.	<ol style="list-style-type: none"> <li>1. Reseat the media tray.</li> <li>2. Call for service.</li> </ol>
Alarm panel fault  (This LED is only on the alarm panel module in the rear of the BladeCenter HT)	There is an error with the alarm panel module.	<ol style="list-style-type: none"> <li>1. Reseat the alarm panel module.</li> <li>2. Call for service.</li> </ol>



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## Appendix A. BladeCenter HT management-module configuration worksheet

Use the worksheets in this appendix to record the information for configuring the BladeCenter HT unit through the management module. Information about using the worksheet is provided in the *Management Module User's Guide* for your management module.

### General settings

Management-module name	
Contact name	
Physical location	
Clock settings	

### Login profiles

Login ID	Password	Authority level	
		R/O	R/W

**External network interface (eth0)**

DHCP	<input type="checkbox"/> DHCP with rollover to static <input type="checkbox"/> DHCP only <input type="checkbox"/> Static IP only
Host name	
Static IP configuration (configure only if DHCP is disabled)	
IP address	____.____.____.____
Subnet mask	____.____.____.____
Gateway IP address	____.____.____.____

**Internal network interface (eth1)**

Interface IP address	____.____.____.____
Subnet mask	____.____.____.____
Locally administered MAC address	____.____.____.____

## Alerts

<b>Remote alert recipients</b>		
Receives critical alerts only		
	Status	
	Notification method	<input type="checkbox"/> SNMP over LAN <input type="checkbox"/> E-mail over LAN <input type="checkbox"/> IBM Director
	Host name (or IP address)	
	E-mail address	
<b>Global remote alert settings</b>		
Remote alerts retry limit		
Delay between retries		
Include event log with e-mail alerts		<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Alerts to be monitored</b>		
Critical alerts		Select all critical alerts
		Hard disk drive
		Multiple fan module failures
		Power failure
		Temperature
		VRM failure
		Multiple switch module failures
		Invalid configuration
Major alerts		Select all critical alerts
		Single fan failure
		Temperature
		Voltage
		KVM/media tray switching failure
		Redundant module failure
Minor alerts		Power off
		Inventory
		Log 75% full

## Network protocols

<b>SNMP</b>	
SNMP agent	<input type="checkbox"/> Enable <input type="checkbox"/> Disable
SNMP traps	<input type="checkbox"/> Enable <input type="checkbox"/> Disable
Community name	
Host name (or IP address)	
<b>SMTP</b>	
Host name (or IP address)	
<b>DNS</b>	
DNS	<input type="checkbox"/> Enable <input type="checkbox"/> Disable
DNS server IP address 1	____.____.____.____
DNS server IP address 2	____.____.____.____
DNS server IP address 3	____.____.____.____

## Security

Secure Socket Layer (SSL)	<input type="checkbox"/> Enabled <input type="checkbox"/> Disabled
Certificates	<input type="checkbox"/> Self-signed <input type="checkbox"/> Provided by a certificate authority



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## Appendix B. Getting help and technical assistance

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

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### Before you call

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

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

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that

contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

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## Using the documentation

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

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## Getting help and information from the World Wide Web

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

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## How to send Dynamic System Analysis data to IBM

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

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

- **Standard upload:** [http://www.ibm.com/de/support/ecurep/send\\_http.html](http://www.ibm.com/de/support/ecurep/send_http.html)
- **Standard upload with the system serial number:** [http://www.ecurep.ibm.com/app/upload\\_hw](http://www.ecurep.ibm.com/app/upload_hw)
- **Secure upload:** [http://www.ibm.com/de/support/ecurep/send\\_http.html#secure](http://www.ibm.com/de/support/ecurep/send_http.html#secure)
- **Secure upload with the system serial number:** [https://www.ecurep.ibm.com/app/upload\\_hw](https://www.ecurep.ibm.com/app/upload_hw)

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## Creating a personalized support web page

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

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## Software service and support

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電話：0800-016-888

IBM Taiwan product service contact information:  
IBM Taiwan Corporation  
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## Important notes

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

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

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

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

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

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Each solid-state memory cell has an intrinsic, finite number of write cycles that the cell can incur. Therefore, a solid-state device has a maximum number of write cycles that it can be subjected to, expressed as “total bytes written” (TBW). A device that has exceeded this limit might fail to respond to system-generated commands or might be incapable of being written to. IBM is not responsible for replacement of a device that has exceeded its maximum guaranteed number of program/erase cycles, as documented in the Official Published Specifications for the device.

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## Particulate contamination

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

*Table 1. Limits for particulates and gases*

Contaminant	Limits
Particulate	<ul style="list-style-type: none"> <li>The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2<sup>1</sup>.</li> <li>Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282.</li> <li>The deliquescent relative humidity of the particulate contamination must be more than 60%<sup>2</sup>.</li> <li>The room must be free of conductive contamination such as zinc whiskers.</li> </ul>
Gaseous	<ul style="list-style-type: none"> <li>Copper: Class G1 as per ANSI/ISA 71.04-1985<sup>3</sup></li> <li>Silver: Corrosion rate of less than 300 Å in 30 days</li> </ul>

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

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

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

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

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## **Electronic emission notices**

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

## **Federal Communications Commission (FCC) statement**

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

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

## **Avis de conformité à la réglementation d'Industrie Canada**

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Responsible manufacturer:

International Business Machines Corp.  
New Orchard Road  
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914-499-1900

European Community contact:

IBM Deutschland GmbH  
Technical Regulations, Department M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Telephone: +49 7032 15 2941  
Email: lugi@de.ibm.com

## Germany Class A statement

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

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## **Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**

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

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH  
Technical Regulations, Abteilung M372  
IBM-Allee 1, 71139 Ehningen, Germany  
Telephone: +49 7032 15 2941  
Email: lugi@de.ibm.com

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高調波ガイドライン適合品

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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。



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