



**@server**

xSeries 130

## **User's Reference**





IBM xSeries 130



# User's Reference

**Note:** Before using this information and the product it supports, be sure to read the general information in Appendix B, “Product warranty and notices,” on page 123.

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# Safety

Before installing this product, read the Safety Information.

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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.

#### Statement 1



#### DANGER

**Electrical current from power, telephone, and communication cables is hazardous.**

**To avoid a shock hazard:**

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

#### To Connect:

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

#### To Disconnect:

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

## Statement 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.

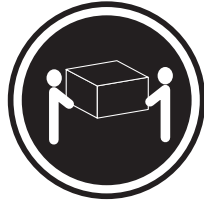


### **DANGER**

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.

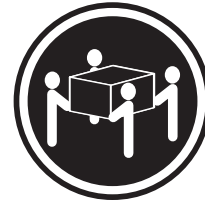
Statement 4



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



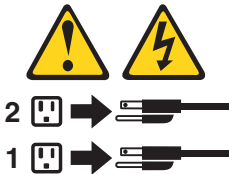
≥ 55 kg (121.2 lb)

**CAUTION:**  
Use safe practices when lifting.

Statement 5



**CAUTION:**  
The power control button on the device and the power switch on the power supply do 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.



**Statement 8**



**CAUTION:**

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



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



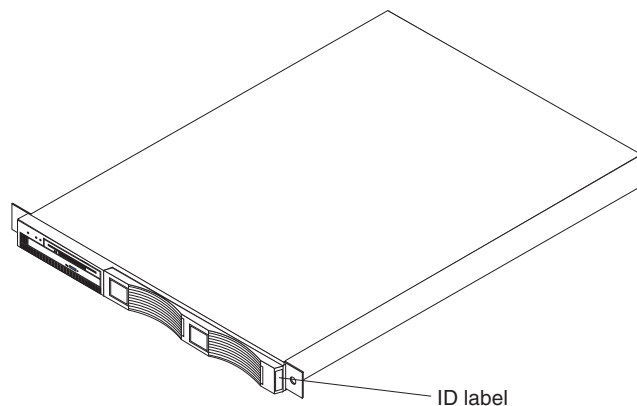
# Chapter 1. Introduction

Your IBM® eServer xSeries 130 appliance server is a one-U-high<sup>1</sup> rack model Web hosting appliance server. This high-performance appliance server is ideally suited for networking environments that require superior performance, efficient memory management, flexibility, and reliable data storage.

Packaged with the IBM xSeries 130 appliance server are the following items:

- *IBM xSeries 130 Installation Guide*
- The xSeries 130 appliance server:
  - Mounting brackets and hardware
  - Cage nuts or clip nuts
  - C2T chaining cable (model 8654 only)
  - C2T device breakout cable (model 8654 only)
  - Power cord
  - Cable straps
- *IBM xSeries 130 and xSeries 135 Documentation CD*
- *Supplementary CD*
- *Recovery CD*
- *Multiple Language User Interface CD*
- *Rack Mounting Instructions* and template

Your appliance server serial number and model number are located on the ID label located on the right edge of the appliance server bezel, as shown in the following illustration. You will need these numbers when you register your appliance server with IBM.



*Figure 1. Locating the ID label*

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

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1. Rack cabinets are marked in vertical increments of 1.75 inches. Each increment is referred to as a unit (U). A one-U-high device is 1.75 inches tall.

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## Notices and statements used in this book

The Caution statements and the Danger statements also appear in the multilingual safety information book provided on the *Documentation CD*. Each statement is numbered for easy reference to the corresponding statement in the safety book.

The notice and statement definitions are as follows:

- **Notes:** 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.

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## Reliability, availability, and serviceability features

Three of the features in the appliance server design are reliability, availability, and serviceability (RAS). These factors help to ensure the integrity of the data that is stored on your appliance server; that your server is available when you want to use it; and that should a failure occur, you can easily diagnose and repair the failure with minimal inconvenience.

The following is an abbreviated list of the RAS features that your appliance server supports.

- Menu-driven setup, system configuration, and diagnostic programs
- Power-on self-test (POST)
- Integrated advanced system management processor (model 8654 only)
- Predictive Failure Analysis<sup>®</sup> (PFA)
- Remote system problem-analysis support
- Power and temperature monitoring
- Error codes and messages
- System error logging
- Automatic restart after a power failure
- CRC checking on the SCSI buses (model 8654 only)
- Error checking and correcting (ECC) memory
- Redundant Ethernet capabilities
- Light Path Diagnostics<sup>™</sup> panel feature on the system board (model 8654 only)
- Vital product data (VPD) on the system board and SCSI backplane (model 8654 only)
- Customer support center 24 hours per day, 7 days a week<sup>1</sup>

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<sup>1</sup>.Service availability will vary by country. Response time will vary depending on the number and nature of incoming calls.



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## System requirements

The Universal Manageability Services (UM Services) client is preinstalled on the appliance server. You must have a supported Web browser installed on your remote workstation to communicate with the appliance server. The supported browsers are Microsoft® Internet Explorer versions 4.01 through 5.5.

The IBM Advanced Appliance Configuration Utility agent is preinstalled on the appliance server. You can use the Advanced Appliance Configuration Utility to manage one or many appliance servers. You must install the Advanced Appliance Configuration Utility console from the *Supplementary* CD on the remote workstation you are using to manage the appliance server.

### Notes:

1. If you are using Internet Explorer 5.x, you must install Java™ Virtual Machine (VM) support to access the appliance server through UM Services.
2. UM Services requires Microsoft VM Build 3165 or later. Download the latest Microsoft VM from the Microsoft Web site.
3. The remote workstation running the Advanced Appliance Configuration Utility must be on the same physical subnet as the appliance server.

---

## Software on the xSeries 130

The following software is installed on the xSeries 130 appliance server. You might need to install additional components to use all of the software features.

- **Microsoft Windows® Powered**

Microsoft Windows Powered is optimized for the xSeries 130 appliance server.

- **IBM Advanced Appliance Configuration Utility**

The Advanced Appliance Configuration Utility agent is preinstalled on your appliance server. You must install the Advanced Appliance Configuration Utility console from the *Supplementary* CD on a remote workstation that is on the same physical subnet as your appliance server. The utility detects the presence of xSeries appliances on the network, and enables you to set up and manage the network configuration for one or multiple appliance servers. The IBM Advanced Appliance Utility provides the following:

- Automatic discovery of appliance servers
- Point to point management
- Installation and management of multiple appliances
- Automatic assignment of static IP addresses from a specified range to newly installed appliances
- DHCP compatibility
- Reprovisioning, which enables you to do the following on your appliance server:
  - Create an appliance image
  - Apply an appliance image
  - Remotely initiate a factory image restoration

You can also use the Advanced Appliance Configuration Utility to start Universal Manageability Services (UM Services) on the appliance server, and perform other advanced systems-management tasks.

- **Universal Manageability Services**

Universal Manageability Services (UM Services) is the primary tool for point-to-point remote management of client systems through a Web browser interface. In addition to point-to-point systems-management support, UM Services also includes support for UM Services Upward Integration Modules (UIMs).

UIMs enable system-management professionals who use any supported system-management platform, including Tivoli® Enterprise™, CA Unicenter TNG Framework, and Microsoft Systems Management Server (SMS) to integrate portions of UM Services into their systems-management console. It uses industry-standard information-gathering technologies and messaging protocols such as: Common Information Model (CIM), Desktop Management Interface (DMI), and simple network management protocol (SNMP).

Use UM Services to:

- Learn detailed inventory information about your appliance servers, including operating system, memory, network adapters, and hardware
- Track your appliance servers in a proactively with features such as power management, event log, and system monitor capabilities

- **Microsoft Server Appliance Kit**

The Microsoft Server Appliance Kit for Web Servers is a Web based administrative tool. It provides access to the Web server service, Web site management, administrative e-mail alerts, and other necessary tasks. You can manage your appliance server using this kit through a port on your appliance server.

- **Microsoft Windows Terminal Services Client**

Terminal Services Client, when installed on a workstation that is attached to the same subnet as the appliance server, enables remote administration of the appliance. You can use Terminal Services for advanced network administration.

- **Netfinity® Web Server Accelerator**

Netfinity Web Server Accelerator (NWSA) is a kernel-mode web caching product. When properly configured, NWSA can improve your Web-hosting performance. By default, NWSA is installed but disabled on the xSeries 130. For more information on enabling, disabling and managing NWSA, see the NWSA link on the xSeries 130 setup and configuration Web page.

- **IBM Director version 2.2**

IBM Director enables you to manage aspects of the software applications, network operating system services, networks, and hardware. IBM Director provides integrated management across the network and automated operation.

## The IBM xSeries 130 model 8654 appliance server

This section provides general information about the model 8654 appliance server. For information about the model 8672, see “The IBM xSeries 130 model 8672 appliance server” on page 8.

### Features and specifications

The following table provides a summary of the features and specifications for the xSeries 130 model 8654 appliance server.

<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>One Intel® Pentium® III 1 GHZ microprocessor with MMX™ technology and SIMD extensions</li> <li>256 KB level-2 cache</li> <li>Supports up to two 1 GHZ microprocessors</li> </ul> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>Standard: 256 MB</li> <li>Maximum: 2 GB</li> <li>Type: PC133 MHz, ECC SDRAM, registered DIMMs</li> <li>Slots: Four dual inline</li> <li>Supports 128 MB, 256 MB, 512 MB, and 1 GB DIMMs</li> </ul> <p><b>Drives:</b></p> <ul style="list-style-type: none"> <li>Diskette: 1.44 MB</li> <li>CD-ROM: 24-10X IDE</li> <li>One 18.2 GB 10K SCSI hard disk drive</li> <li>Supports two 36 GB 10K SCSI hard disk drives maximum</li> </ul> <p><b>Expansion bays:</b></p> <p>Two 3.5-inch slim-high bays for SCSI hard disk drives (one available)</p> <p><b>PCI expansion slots:</b></p> <p>Two 33 MHz, 64-bit</p> <p><b>Power supply:</b></p> <p>One 200 watt (115-230 V ac)</p>	<p><b>Video:</b></p> <ul style="list-style-type: none"> <li>S3 video controller on the system board</li> <li>Compatible with SVGA</li> <li>8 MB SDRAM video memory</li> </ul> <p><b>Size:</b></p> <ul style="list-style-type: none"> <li>Height: 4.37 cm (1.75 in.)</li> <li>Depth: 63.5 cm (25.72 in.)</li> <li>Width: 43.9 cm (17.32 in.)</li> <li>Weight: approximately 12.7 kg (28 lb) when fully configured</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>One Ultra160 SCSI controller</li> <li>Dual 10BASE-T/100BASE-TX Intel Ethernet controllers on the system board</li> <li>One serial port</li> <li>Two Universal Serial Bus (USB) ports</li> <li>Advanced System Management (ASM) processor</li> <li>Two RS-485 ASM ports (one in, one out)</li> <li>Two C2T ports (one in, one out)</li> </ul> <p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>Sound power, idling: 6.1 bel maximum</li> <li>Sound power, operating: 6.2 bel maximum</li> </ul>	<p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>Air temperature: <ul style="list-style-type: none"> <li>Server on: 10° to 35° C (50.0° to 95.0° F). Altitude: 0 to 914 m (2998.7 ft)</li> <li>Server on: 10° to 32° C (50.0° to 89.6° F). Altitude: 914 m (2998.7 ft) to 2133 m (6998.0 ft)</li> <li>Server off: 10° to 43° C (50.0° to 109.4° F). Maximum altitude: 2133 m (6998.0 ft)</li> </ul> </li> <li>Humidity: <ul style="list-style-type: none"> <li>Server on: 8% to 80%</li> <li>Server off: 8% to 80%</li> </ul> </li> </ul> <p><b>Heat output:</b></p> <p>Approximate heat output in British thermal units (Btu) per hour</p> <ul style="list-style-type: none"> <li>Minimum configuration: 273 Btu (80 watts)</li> <li>Maximum configuration: 751 Btu (220 watts)</li> </ul> <p><b>Electrical input:</b></p> <ul style="list-style-type: none"> <li>Sine-wave input (50-60 Hz) required</li> <li>Input voltage low range: <ul style="list-style-type: none"> <li>Minimum: 100 V ac</li> <li>Maximum: 127 V ac</li> </ul> </li> <li>Input voltage high range: <ul style="list-style-type: none"> <li>Minimum: 200 V ac</li> <li>Maximum: 240 V ac</li> </ul> </li> <li>Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> <li>Minimum: 0.08 kVA</li> <li>Maximum: 0.22 kVA</li> </ul> </li> </ul>
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Table 1. Features and specifications for the xSeries 130 model 8654.

## Controls and indicators on the model 8654 appliance server

This section identifies the controls and indicators on the front and rear of the appliance server.

### Front view

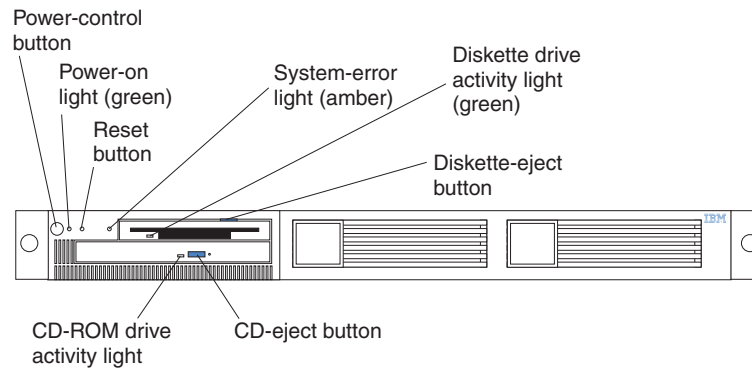


Figure 2. Identifying appliance server controls and indicators on the xSeries 130 model 8654

**Power-control button:** Press this button to manually turn on or turn off the appliance server.

**Power-on light:** This green LED blinks when the appliance server is off and stays on when you turn on your appliance server.

**Reset button:** Press this button to reset the appliance server and run the power-on self-test (POST).

**System-error light:** This amber LED lights when a system error occurs. An LED on the Light Path Diagnostics™ panel on the system board will also be on to further isolate the error.

**Diskette drive activity light:** When this LED is on, it indicates that the diskette drive is in use.

**Diskette-eject button:** Push this button to release a diskette from the drive.

**CD-eject button:** Push this button to release a CD from the drive.

**CD-ROM drive activity light:** When this light is on, it indicates that the CD-ROM drive is in use.

## Rear view

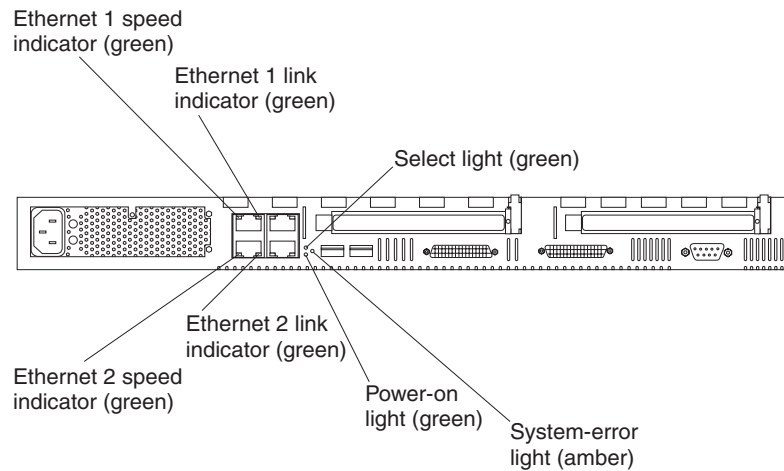


Figure 3. Identifying appliance server controls and indicators on the xSeries 130 model 8654

**Ethernet 1 speed indicator:** This green LED lights when the speed of the Ethernet LAN that is connected to Ethernet port 1 is 100 Mbps.

**Ethernet 1 link indicator:** This green LED lights when there is an active link connection on the 10BASE-T or 100BASE-TX interface for Ethernet port 1.

**Select light:** This green LED lights when the monitor, keyboard, and mouse are logically connected to this appliance server. This light duplicates the LED in the select button/indicator on the front of the appliance server.

**System-error light:** This amber LED lights when a system error occurs. An LED on the Light Path Diagnostics panel on the system board will also be on to further isolate the error. This light duplicates the system-error light on the front of the server.

**Power-on light:** This green LED lights and stays on when you turn on your appliance server. This light duplicates the power-on light on the front of the appliance server.

**Ethernet 2 link indicator:** This green LED lights when there is an active link connection on the 10BASE-T or 100BASE-TX interface for Ethernet port 2.

**Ethernet 2 speed indicator:** This green LED lights when the speed of the Ethernet LAN that is connected to Ethernet port 2 is 100 Mbps.

# The IBM xSeries 130 model 8672 appliance server

This section provides general information about the model 8672 appliance server.

## Features and specifications

The following table provides a summary of the features and specifications for the xSeries 130 model 8672 appliance server.

<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>One Intel Celeron™ 800 MHz microprocessor with MMX™ (MMX2) technology</li> <li>128 KB Level-2 cache</li> </ul> <p><b>Memory:</b></p> <ul style="list-style-type: none"> <li>Standard: 256 MB</li> <li>Maximum: 1.5 GB</li> <li>Type: PC133 MHz, ECC SDRAM, unregistered DIMMs only</li> <li>Slots: Three dual inline</li> <li>Supports 128 MB, 256 MB, and 512 MB DIMMs</li> </ul> <p><b>Drives:</b></p> <ul style="list-style-type: none"> <li>Diskette: 1.44 MB</li> <li>CD-ROM: 24-10X IDE</li> <li>One 20 GB IDE hard disk drive</li> <li>Supports two 40 GB IDE hard disk drives maximum</li> </ul> <p><b>Expansion bays:</b></p> <p>Two 3.5 inch slim-high bays for IDE hard disk drives (one available)</p> <p><b>Power supply:</b></p> <p>One 200 watt (110 or 220 V ac auto-sensing) with Wake on LAN® support</p>	<p><b>Video:</b></p> <ul style="list-style-type: none"> <li>S3 Savage 4 Pro video controller on the system board</li> <li>Compatible with SVGA and VGA</li> <li>8 MB SDRAM video memory</li> </ul> <p><b>Size:</b></p> <ul style="list-style-type: none"> <li>Height: 4.37 cm (1.75 in.)</li> <li>Depth: 63.5 cm (25 in.)</li> <li>Width: 44 cm (17.32 in.)</li> <li>Maximum weight: 19.05 kg (42 lb) depending on your configuration</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>Dual-channel bus mastering IDE controller</li> <li>Dual 10BASE-T/100BASE-TX Ethernet controllers on the system board with Alert on LAN™ 2 support</li> <li>One serial port</li> <li>Two Universal Serial Bus (USB) ports</li> <li>Keyboard port</li> <li>Mouse port</li> </ul> <p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>Sound power, idling: 6.6 bel maximum</li> <li>Sound power, operating: 6.8 bel maximum</li> </ul>	<p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>Air temperature: <ul style="list-style-type: none"> <li>Server on: 10° to 35° C (50.0° to 95.0° F). Altitude: 0 to 914 m (2998.7 ft)</li> <li>Server on: 10° to 32° C (50.0° to 89.6° F). Altitude: 914 m (2998.7 ft) to 2133 m (6998.0 ft)</li> <li>Server off: -40° to 60° C (-104° to 140° F). Maximum altitude: 2133 m (6998.0 ft)</li> </ul> </li> <li>Humidity: <ul style="list-style-type: none"> <li>Server on: 8% to 80%</li> <li>Server off: 5% to 100%</li> </ul> </li> </ul> <p><b>Heat output:</b></p> <p>Approximate heat output in British thermal units (Btu) per hour</p> <ul style="list-style-type: none"> <li>Minimum configuration: 171 Btu (50 watts)</li> <li>Maximum configuration: 410 Btu (120 watts)</li> </ul> <p><b>Electrical input:</b></p> <ul style="list-style-type: none"> <li>Sine-wave input (47-63 Hz) required</li> <li>Input voltage low range: <ul style="list-style-type: none"> <li>Minimum: 90 V ac</li> <li>Maximum: 137 V ac</li> </ul> </li> <li>Input voltage high range: <ul style="list-style-type: none"> <li>Minimum: 180 V ac</li> <li>Maximum: 265 V ac</li> </ul> </li> <li>Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> <li>Minimum: 0.09 kVA</li> <li>Maximum: 0.21 kVA</li> </ul> </li> </ul>
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Table 2. Features and specifications for the xSeries 130 model 8672.

## Controls and indicators on the model 8672 appliance server

The following section identifies the controls and indicators on the front and rear of the appliance server.

### Front view

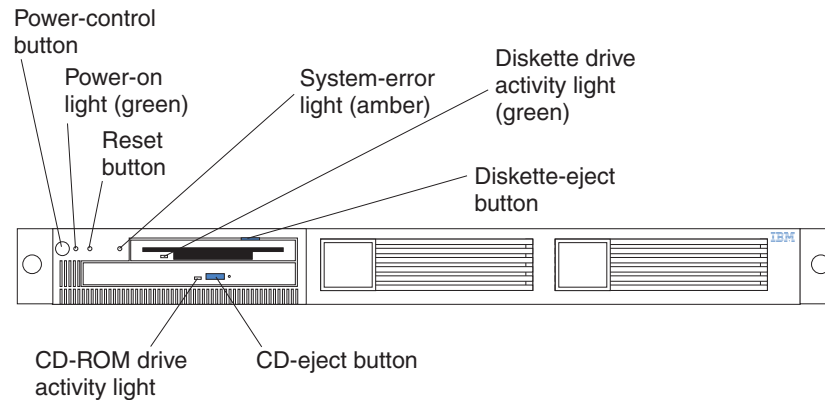


Figure 4. Identifying appliance server controls and indicators on the xSeries 130 model 8672

**Power-control button:** Press this button to manually turn on or turn off the appliance server.

**Power-on light:** This green LED lights and stays on when you turn on your appliance server, and it blinks when the appliance server is in standby mode.

**Reset button:** Press this button to reset the appliance server and run the power-on self-test (POST).

**System-error light:** This amber LED lights when a system error occurs.

**Diskette drive activity light:** When this LED is on, it indicates that the diskette drive is in use.

**Diskette-eject button:** Push this button to release a diskette from the drive.

**CD-eject button:** Push this button to release a CD from the drive.

**CD-ROM drive activity light:** When this light is on, it indicates that the CD-ROM drive is in use.

## Rear view

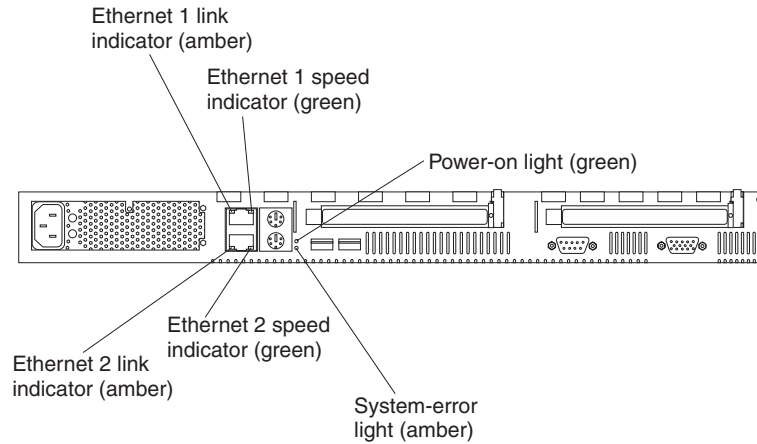


Figure 5. Identifying appliance server controls and indicators on the xSeries 130 model 8672

**Ethernet 1 link indicator:** This amber LED lights when there is an active link connection on the 10BASE-T or 100BASE-TX interface for Ethernet port 1.

**Ethernet 1 speed indicator:** This green LED lights when the speed of the Ethernet LAN that is connected to Ethernet port 1 is 100 Mbps.

**Power-on light:** This green LED lights and stays on when you turn on your appliance server and it will blink when the appliance server is in standby mode. This light duplicates the power-on light on the front of the appliance server.

**System-error light:** This amber LED lights when a system error occurs. This light duplicates the system-error light on the front of the appliance server.

**Ethernet 2 speed indicator:** This green LED lights when the speed of the Ethernet LAN connected to Ethernet port 2 is 100 Mbps.

**Ethernet 2 link indicator:** This amber LED lights when there is an active link connection on the 10BASE-T or 100BASE-TX interface for Ethernet port 2.



---

## Turning on the appliance server

Complete the following steps to turn on the appliance server:

### Statement 1



### DANGER

**Electrical current from power, telephone, and communication cables is hazardous.**

**To avoid a shock hazard:**

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.**

<b>To Connect:</b>	<b>To Disconnect:</b>
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

1. Plug the power cord of your appliance server into the power source.

**Note:** Plugging the power cord into a power source might cause the appliance server to start automatically. This is an acceptable action.

2. Wait 30 seconds, and then press the power-control button on the front of the appliance server.

---

## Turning off the appliance server

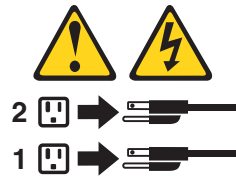
Turning off the appliance server refers to the act of disconnecting the appliance server from the power source.

### Statement 5



#### CAUTION:

The power control button on the device and the power switch on the power supply do 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.



Complete the following steps to turn off the appliance server:

1. Use UM Services to remotely shut down your appliance server. See “xSeries 130 Configuration Tools” on page 17 for more information.
2. Press the power-control button on the front of the appliance server. This will put the appliance server into standby mode.
3. Disconnect the appliance server from the power source.

**Note:** After you turn off the appliance server, wait at least 5 seconds before you turn on the appliance server again.

---

## Standby mode

Standby mode puts the appliance server into a wait state. When in a wait state, the appliance server is not running the operating system, and all core logic is shut down.

Complete the following steps to put the appliance server into the standby mode:

1. Use UM Services to remotely shut down your appliance server. See “xSeries 130 Configuration Tools” on page 17 for more information.
2. Press the power-control button on the front of the appliance server.

---

## Chapter 2. Arranging your workspace

To get the most from your server, arrange both the equipment you use and your work area to suit your needs and the kind of work you do. Your comfort is of foremost importance, but light sources, air circulation, and the location of electrical outlets also can affect the way you arrange your workspace.

---

### Comfort

Although no single working position is ideal for everyone, here are a few guidelines to help you find a position that suits you best.

Sitting in the same position for a long time can cause fatigue. A good chair can make a big difference. The backrest and seat should adjust independently and provide good support. The seat should have a curved front to relieve pressure on the thighs. Adjust the seat so that your thighs are parallel to the floor and your feet are either flat on the floor or on a footrest.

When using the keyboard, keep your forearms parallel to the floor and your wrists in a neutral, comfortable position. Try to keep a light touch on the keyboard and your hands and fingers relaxed. You can change the angle of the keyboard for maximum comfort by adjusting the position of the keyboard feet.

Adjust the monitor so the top of the screen is at, or slightly below, eye level. Place the monitor at a comfortable viewing distance, usually 51 to 61 cm (20 to 24 in.), and position it so you can view it without having to twist your body. Also position other equipment you use regularly, such as the telephone or a mouse, within easy reach.

---

### Glare and lighting

Position the monitor to minimize glare and reflections from overhead lights, windows, and other light sources. Even reflected light from shiny surfaces can cause annoying reflections on your monitor screen. Place the monitor at right angles to windows and other light sources, when possible. Reduce overhead lighting, if necessary, by turning off lights or using lower wattage bulbs. If you install the monitor near a window, use curtains or blinds to block the sunlight. You might have to adjust the Brightness and Contrast controls on the monitor as the room lighting changes throughout the day.

Where it is impossible to avoid reflections or to adjust the lighting, an antiglare filter placed over the screen might be helpful. However, these filters might affect the clarity of the image on the screen; try them only after you have tried all other methods of reducing glare.

Dust buildup compounds problems that are associated with glare. Remember to clean your monitor screen periodically using a soft cloth that is moistened with a nonabrasive liquid glass cleaner.

---

## Air circulation

Your server and monitor produce heat. Your server has one or more fans that pull in fresh air and force out hot air. The monitor lets hot air escape through vents. Blocking the air vents can cause overheating, which might result in a malfunction or damage. Place the server and monitor so that nothing blocks the air vents; usually, 15 cm (6 inches) of air space is sufficient. Also, make sure that the vented air is not blowing on someone else.

---

## Electrical outlets and cable lengths

The location of electrical outlets and the length of power cords and cables that connect to the monitor, printer, and other devices might determine the final placement of your server.

When arranging your workspace:

- Avoid the use of extension cords. When possible, plug the server power cords directly into electrical outlets.
- Keep power cords and cables neatly routed away from walkways and other areas where they might get kicked accidentally.

For more information about power cords, refer to the power cord information in this on-line publication.

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## Chapter 3. Configuring your xSeries 130 appliance server

This chapter describes how to configure your xSeries 130 appliance server. If you need to change the operating system of your appliance server to a language other than English, see “Changing the language of the operating system” on page 20.

You can configure your appliance server remotely by using Windows Remote Terminal Services, or directly by attaching a monitor, keyboard, and mouse to the appliance server. For more information on cabling directly to your appliance server, see “Cabling the model 8654 appliance server” on page 69 or “Cabling the model 8672 appliance server” on page 73.

Use the following general procedure to help you configure the appliance server:

1. Designate a workstation to use to remotely manage the appliance server.
2. Configure your appliance server.
  - If you are configuring one appliance server, start your system using UM Services, see “Configuring the xSeries 130 using Universal Manageability Services”.
  - If you are configuring multiple appliance servers, see Chapter 4, “The Advanced Appliance Configuration Utility,” on page 33.

**Note:** If you do not use the Advanced Appliance Configuration Utility or DHCP to set your IP address, then you must set the IP address manually. Changing the IP address forces you to connect your system through UM Services using the host name (if it has not changed) or the new IP address.

After you configure the appliance server, you can:

- Configure your Web site and transfer Web content to the appliance server using the tools available (see “Appliance setup and configuration Web page” on page 16).
- Manage your appliance server using UM Services or the Advanced Appliance Configuration Utility.

---

### Configuring the xSeries 130 using Universal Manageability Services

Universal Manageability Services (UM Services) provides you with local or remote administering, monitoring, and maintenance of the xSeries 130 through a Web browser.

To start UM Services and set your appliance server IP address, do the following:

1. Connect the workstation from which you will manage the appliance server to the same physical subnet as your appliance server.
2. Start your Web browser.
3. In the **Address** or **Location** field of the browser:
  - For a secure connection, type `https://imodelserial:1412`
  - For a non-secure connection, type `http://imodelserial:1411`

**Note:** For example, `i86545DX25A1234`. Model is the model type of your appliance server and serial is the serial number that is located in the lower-right corner of the bezel. For more information on the location, see Figure 1 on page 1.

4. Press Enter, a user login window opens.

5. Use the following case-sensitive user name and password to log in.

In the **Username** field, type

Administrator

and in the **Password** field, type

password

**Note:** Change these defaults to ensure the security of your system.

6. You can leave the **Domain** field blank. Make sure the **Save this password in your password list** check box is cleared, and then click **OK**. You can manage your appliance server and Web sites from this page.

**Note:** The first time you connect your remote workstation to the appliance server, you are prompted to install XML and Swing components on the Web-browser for the remote workstation you are using to manage the appliance. Follow the on-screen instructions to install these components. When prompted, click **Run from current location**; and then, close and restart Internet Explorer before you proceed.

The system is connected to the appliance through UM Services. Complete documentation on how to use UM Services is included on the *Documentation CD*.

**Note:** By default, the appliance server uses DHCP. If you do not have a DHCP server on the network, the appliance is assigned an IP address of 169.254.x.y (where x and y are random numbers) and a subnet mask of 255.255.0.0.

Continue with the “Appliance setup and configuration Web page”.

---

## Appliance setup and configuration Web page

You can set up and configure your appliance server from the xSeries 130 Web page. This page provides configuration information, documentation, software help, and brief troubleshooting information. The directions and information you need to set up your appliance server and transfer Web content are found on this Web site. To set up and transfer Web content to the appliance server do the following:

1. From the Web page, click **Setup Guide** for an overview of the tasks to complete, and to display the options available for adding Web content to your appliance server. For more information on the features of the UM Services Web page see the “xSeries 130 Configuration Tools” on page 17.
2. After you create your Web content, you can add it to the appliance server using the Terminal Services. You can use Web-based Terminal Services through UM Services or the Terminal Services client on your remote management workstation.
3. Manage your Web site and appliance server using the tools on the Appliance setup and configuration Web page.

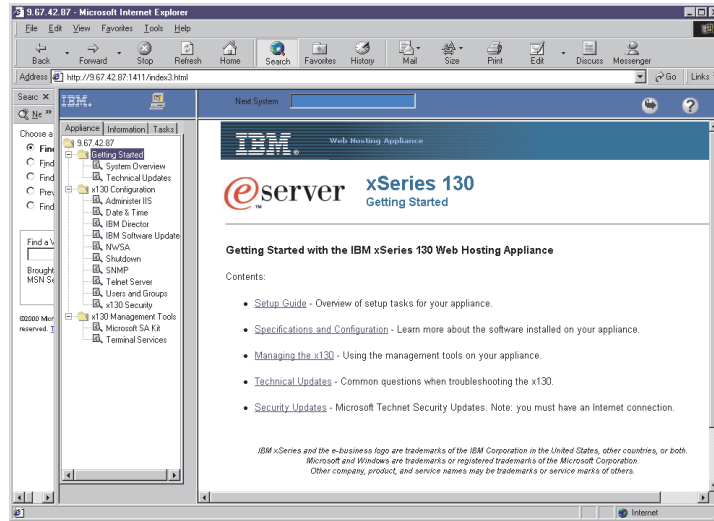


Figure 6. Managing the xSeries 130 Web page

## Getting Started

This option provides an overview of the appliance server now to get started and links to additional technical updates. There are links that provide additional information on using these features.

## xSeries 130 Configuration Tools

You can use these additional configuration tools on your appliance server. For additional information click the links on this web page.

<b>Administer Internet Information Services (IIS)</b>	This feature allows you to manage the Web-server software. For more information on using IIS, click the online help links that are displayed when you open IIS.
<b>Date and Time</b>	This feature enables you to set the date and time attributes for your appliance server.
<b>IBM Director</b>	IBM Director enables you to manage aspects of the software applications, network operating system services, networks, and hardware. IBM Director provides integrated management across the network and highly automated, almost unattended operation.
<b>IBM Software updates</b>	You can automatically update your appliance server software by selecting the Update Software button. Click <b>No</b> to save the download of the update, or click <b>Yes</b> to download and apply the new package. <b>Note:</b> You are able to download your own update package if you want to be able to distribute the updates on an intranet. A Web page enables you to specify the FTP server, user and password, and package to download. You must apply the package manually after downloading.
<b>Netfinity Web Server Accelerator (NWSA)</b>	This link enables you to manage, view documentation, and enable or disable NWSA. By default, NWSA is disabled on the xSeries 130. For more detailed information about NWSA, click this link.
<b>Shutdown</b>	You can use the shutdown tab to remotely shut down, restart, or log off of your appliance. You can use this feature to restart the appliance after changing the Computer name through the Advanced Appliance Configuration Utility.

<b>SNMP</b>	This tool is used to enable SNMP trap destinations. It is available only if the SNMP services is enabled.
<b>Telnet Server</b>	You can use this feature to enable TELNET access to the appliance.
<b>Users and Groups</b>	You can use this feature to manage Windows user accounts and user groups.
<b>xSeries 130 Security</b>	You can use this feature to audit the appliance server security for the xSeries 130.

## Management tools

You can use Terminal Services or the Microsoft Server Appliance Kit to manage your appliance server.

### Web-based Terminal Services

You can use Terminal Services to connect to your appliance server. To start Terminal Services from UM Services, do the following:

1. Click the **Terminal Services** tab.
2. Select a size, other than full screen, for the appliance desktop to appear in, and then click **Connect** to start the Terminal Services Client session on the appliance. A user login window opens.
3. Log in to the appliance. In the **Username** field, type  
Administrator  
In the **password** field, type  
password  
and then click **OK** to log in. After you log in, you can begin using Terminal Services Client to configure and manage your appliance server.  
**Note:** To ensure system security, change the administrator password from password. After you do, or if you create another user in the Administrator group in the future, use your new user name and password instead of the default user name and password combination.
4. Copy the Web content from the system where it is stored to the Web site directory on the appliance (d:\websites\mywebsite by default).
5. Set up the Web site properties that you want using the Server Appliance Kit or Internet Information Services. Restart the Web site to begin serving the content.

### Microsoft Server Appliance Kit

The Microsoft Server Appliance Kit enables remote management of your appliance server through a Web browser. Click the Server Appliance Kit link for a secure connection, or:

- For a secure connection, type https://hostname:8098
- For a non-secure connection, type http://hostname:8099



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## Using Windows Remote Terminal Services

If you do not want to use Web based Terminal Services, you can use Windows Remote Terminal Services. To do so, you need to install the Windows Remote Terminal Services Client on the remote workstation that you are using to manage your appliance server. To install Windows Remote Terminal Services, do the following:

**Note:** The workstation you use must be on the same logical and physical subnet as the appliance server.

1. Insert the *Supplementary CD* into your remote system CD-ROM drive (not the appliance server).
2. Click **Start** → **Run**.
3. In the **Open** field, type (with quotation marks, and substitute your CD-ROM drive letter for *e*)

"e:\Terminal Services Client\Disk 1\setup.exe"

Then, click **OK** to begin the Terminal Services Client Setup program.

4. In each window that opens, accept the defaults. For additional information, see the Microsoft Windows documentation. When the Terminal Services Client Setup program is completed, proceed to the next step.
5. Check the workstation network TCP/IP protocol configuration settings.

**Note:** By default, the appliance server uses DHCP. If you do not have a DHCP server on the network, the appliance is assigned the IP address 169.254.x.y (where x and y are random numbers) and a subnet mask of 255.255.0.0.

6. Connect your remote management system to the xSeries 130 appliance using the Terminal Services Client.
7. In the Terminal Services Client window, type `imodelserial` (for example, `i86545DX25A1234`)

where `model` is the model type of your appliance server and `serial` is the serial number that is located in the right side of the bezel. For more information on the location see Figure 1 on page 1.

8. Click **Connect**.
9. Log in to the xSeries 130 appliance server.

Use the following case-sensitive user name and password to log in to terminal services

In the **Username** field, type

Administrator

and in the **Password** field, type

password

**Attention:** Change these defaults to ensure the security of your system.

The remote workstation is connected to the appliance server through Terminal Services. Complete documentation on how to use Terminal Services is found on the UM Services Web-page by clicking on the matching link.

---

## Changing the language of the operating system

You can change the language of the appliance server operating system using the *Multiple Language User Interface CD* that is included with the xSeries 130 appliance server. Using this CD you can change the base operating-system language to any one of the following languages:

- English
- Chinese (Simplified)
- Chinese (Traditional)
- French
- German
- Italian
- Japanese
- Spanish

**Note:** The *Multiple Language User Interface CD* is provided by Microsoft and changes the language of the base operating system only. Preinstalled applications and documentation remain in English. Languages such as Japanese or Chinese might prompt you to insert the *Windows 2000 Advanced Server CD*. If you are prompted to do this, insert the *Supplementary CD* instead.

To change the language of the operating system, do the following:

1. Insert the *Multiple Language User Interface CD* into the CD-ROM drive of the appliance server.
2. Start a terminal services session on your remote workstation, and log in to the appliance server. Run `setup.exe` from the CD.
3. When the Multi-Language User Interface Install window opens, click **Install MUI**.
4. Read the notices and click **OK**. The contents of the CD are unencrypted and decompressed to drive C. This takes a few minutes. The MultiLanguage File Installation window opens.
5. Select the language that you want to install on the xSeries 130 appliance server. At the bottom of the window, change the default language to correspond to the language you select.
6. Click **OK**. After a few seconds, an Installation Complete message is displayed. Click **OK**.
7. A MUISETUP window opens, stating that changes do not occur until you log off and log back on. Click **OK**. When you are prompted to delete the MUI files for the xSeries 130 appliance server, click **Yes**.

---

## Using the Supplementary CD

The *Supplementary CD* contains documentation and software applications that are approved for your xSeries 130. The following table lists the names of the directories on the *Supplementary CD* and a description of the contents of each directory.

**Note:** If you install, remove, or change the applications on your appliance server, you must install Microsoft Windows 2000 Service Pack 2 from the *Supplementary CD* after you modify the components.

Directory name	Contents
IAAConfig	To install the Advanced Appliance Configuration Utility, run setup.exe from the IAAConfig directory.
Recovery Enablement	DiskCreator.exe creates a recovery enablement disk for use when recovering the appliance. To make a diskette, run the DiskCreator.exe and insert a formatted 1.44 MB diskette into drive A when prompted.
i386	If you add device drivers or operating system features, you might be prompted to insert your <i>Microsoft Windows 2000 Advanced Server CD</i> . If so, insert the <i>Supplementary CD</i> , and specify path e:\i386 where <i>e</i> is the drive letter assigned to your CD-ROM drive, and then reapply Service Pack 2 from the <i>Supplementary CD</i> .
Service Pack 2	The Service Pack 2 Directory contains source files for the Microsoft Windows 2000 Service Pack 2, that is installed on your appliance. See the readme.txt in the directory for notes on using the service pack.
terminalservicesclient	The stand-alone Windows Terminal Services Client application, supports Web-based terminal services. This is an optional installation.  To install the Terminal Services Client, run setup.exe from the Disk1 subdirectory.
NWSA	Netfinity Web Server Accelerator is installed and configured as part of the preinstalled software. However, you can reinstall NWSA from this directory. Do not reinstall NWSA unless directed to do so by an IBM technical-support representative.
documentation	There is additional documentation for supporting the appliance server that is not found on the Documentation CD.
systemtools	The System Tools directory contains utilities to update and configure BIOS and firmware for your appliance. Do not use these utilities unless specifically instructed to do so.

---

## Using the Configuration/Setup Utility program for the xSeries 130

This section provides the instructions needed to start the Configuration/Setup Utility program and descriptions of the available menu choices. You do not need to use this information unless you need to change the BIOS settings of your appliance server.

**Note:** The Configuration/Setup Utility might vary slightly depending upon if you are using the xSeries 130 model 8654 or the xSeries 130 model 8672.

The Configuration/Setup utility is a menu driven utility that is part of the BIOS code that comes with your appliance server, that you can use to:

- Configure serial connector assignments
- Change the drive startup sequence
- Resolve configuration conflicts
- Set the date and time
- Set passwords

The following sections provide instructions for starting the Configuration/Setup Utility program and descriptions of the menu choices that are available.

**Attention:** Your appliance comes with preconfigured BIOS settings. Changing these settings could result in difficulty managing your appliance server. Do not change them unless instructed to do so by IBM support personnel. The preconfigured basic input/output system (BIOS) settings are shown in the following table:

Table 3. Preconfigured BIOS settings.

Start options	Settings
Keyboardless operation mode	Enabled
Displayless operation mode	Enabled
Floppy diskette	Removed from boot sequence
Network	Removed from boot sequence
Virus detection	Disabled
Boot failure detect	Disabled

### Starting the Configuration/Setup Utility program

To start the Configuration/Setup Utility program:

**Note:** To use this program you need to have a keyboard, mouse, and monitor connected to the appliance server.

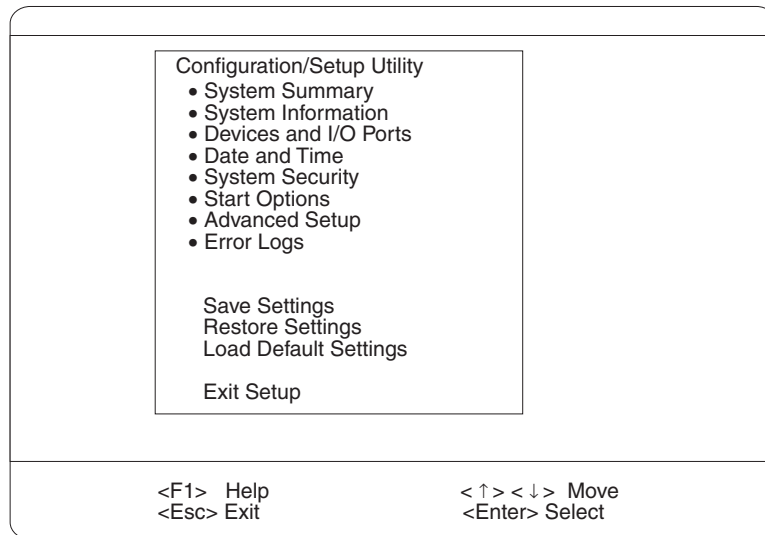
1. Turn on the appliance server and view the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1.

**Note:** If you have set both levels of passwords (user and administrator), you must type the administrator password to access the full Configuration/Setup menu.

3. Follow the instructions that appear on the monitor screen.

## Configuration/Setup main menu choices

From the Configuration/Setup Utility main menu, you can select settings that you want to change. The Configuration/Setup Utility main menu is similar to the following.



### Notes:

1. You can press F1 to display help information for a selected menu item.
2. The choices on some menus might differ slightly, depending on the BIOS version in your appliance server.

The following choices are available from the main menu:

- **System Summary**

Select this choice to display configuration information. This includes the type and speed of the microprocessors and the amount of memory installed.

Changes that you make to configuration settings appear on this summary screen. You cannot edit the fields.

This choice appears on both the full and limited Configuration/Setup Utility menus.

- **System Information**

Select this choice to display information about your appliance server. Changes that you make on other menus might appear on this summary screen. You cannot edit any fields. The **System Information** choice appears only on the full Configuration/Setup Utility main menu.

- **Product Data**

Select this choice to view system information, such as the machine type and model, the appliance server serial number, and the revision level or issue date of the BIOS stored in the flash electrically erasable programmable ROM (EEPROM).

- **System Card Data**

Select this choice to view vital product data (VPD) for some server components.

- **Devices and I/O Ports**

Select this choice to view or change the assignments for devices and input/output ports. This choice appears only on the full Configuration/Setup Utility main menu.

You can also use this choice to enable or disable the integrated SCSI, and Ethernet controllers.

- The default setting is **Enable** for all the controllers. If you select **Disable**, the system will not configure the disabled device, and the operating system will not detect the device. (This is equivalent to unplugging the device.)

- If the on-board SCSI controller (model 8654 only) is disabled and no other storage-device controller is installed, operating system startup cannot occur.

Select **System Service Processor Settings** to view the interrupt-request setting (IRQ) used by the Advanced System Management processor (system service processor). You can then use the arrow keys to select a new IRQ setting for the advanced system management processor from the list of available choices.

- **Date and Time**

Select this choice to set the system date and time and to change the system time sent to the Advanced System Management processor (service processor) when the appliance server is started. This choice appears only on the full Configuration/Setup Utility main menu.

The system time is in a 24-hour format: hour:minute:second.

- **System Security**

Select this choice to set passwords or a system owner's name. This choice appears only on the full Configuration/Setup Utility main menu.

You can implement two levels of password protection:

- **Power-on Password**

Select this choice to set or change a power-on password.

**Note:** If you set a power-on password, you can no longer remotely manage the appliance.

- **Administrator Password**

Select this choice to set or change an administrator password.

**Attention:** If an administrator password is set and then forgotten, it cannot be overridden or removed. You must replace the system board.

The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords and allow a power-on password to be changed by the user.

- **Start Options**

Select this choice to view or change the start options. This choice appears only on the full Configuration/Setup Utility main menu. Start options take effect when you start your appliance server.

You can select keyboard operating characteristics, such as the keyboard speed. You also can specify whether the keyboard number lock starts on or off. You also can enable the appliance server to run without a diskette drive, monitor, or keyboard.

The appliance server uses a startup sequence to determine the device from which the operating system starts. For example, you can define a startup sequence that checks for a startable diskette in the diskette drive, then checks the hard disk drive in bay 1, and then checks a network adapter.

If the **Boot Fail Count** choice is enabled, you must restart the system three times to restore the system BIOS default settings. If this choice is disabled, the system BIOS defaults can be restored only from the Configuration/Setup Utility main menu.

You can enable a virus-detection test that checks for changes in the master boot record at startup.

- **Advanced Setup**

Select this choice to change values for advanced hardware features, such as cache control and PCI configuration. This choice appears only on the full Configuration/Setup Utility main menu.

A warning message appears above the choices on this menu to alert you that the system might malfunction if these options are configured incorrectly. Follow the instructions on the screen carefully.

- **Processor Serial Number Access**

Select this choice to specify whether the microprocessor serial number in the microprocessor is readable.

- **System Partition Visibility**

Select this choice to specify whether the System Partition is visible. To make the System Partition visible, set this value to **Visible**. To make the System Partition invisible, set this value to **Hidden**.

- **Core Chipset Control**

Select this choice to modify settings that control features of the core chip set on the system board.

**Attention:** Do not make changes here unless directed to do so by an IBM authorized service representative.

- **Cache Control**

Select this choice to enable or disable the microprocessor cache. In addition, you can define the microprocessor cache mode as write-back (WB) or write-through (WT). Selecting write-back mode provides better system performance.

- **PCI Slot/Device Information**

Select this choice to view and identify system resources that are used by PCI devices. PCI devices automatically communicate with the appliance server configuration information. This usually results in automatic configuration of a PCI device.

**Attention:** You must use the menu selections to save custom settings for the **PCI Slot/Device Information** choice. The **Save Settings, Restore Settings** and **Load Default Settings** choices on the main menu of the Configuration/Setup Utility do not save the PCI Slot/Device Information settings.

Use the **PCI Device Control** choice to enable or disable the PCI slots from this menu.

The default setting is **Enable** for all the PCI slots. If you select **Disable**, the system will not configure the disabled device, and the operating system will not detect the device. (This is equivalent to unplugging the device.)

- **Memory Settings**

Select this choice to manually disable or enable a bank of memory.

If a memory error is detected during POST or memory configuration, the appliance server can automatically disable the failing memory bank and continue operating with reduced memory capacity. If this occurs, you must manually enable the memory bank after the problem is corrected. Select **Memory Settings** from the Advanced Setup menu, use the arrow keys to highlight the bank that you want to enable; then, use the arrow keys to select **Enable**.

- **Error Logs**

Select this choice to view or clear error logs.

- Select **POST Error Log** to view the three most recent error codes and messages that the system generated during POST.

Select **Clear error logs** from the POST Error Log menu to clear the error log.

- Select **System Event/Error Log** to view the System Event/Error log. The system event/error log contains all the system error and warning messages that the system has generated. You can use the arrow keys to move between pages in the System Event/Error log.

Select **Clear error logs** from the System Event/Error log menu to clear the error or event log.

- **Save Settings**

Select this choice to save your customized settings.

- **Restore Settings**

Select this choice to delete your changes and restore the previous settings.

- **Load Default Settings**

Select this choice to discard your changes and restore the factory settings.

- **Exit Setup**

If you have made any changes, the program will prompt you to save the changes or exit without saving the changes.

## Using passwords

The **System Security** choice appears only on the full Configuration/Setup Utility menu. After you select this choice, you can implement two levels of password protection: power-on password and administrator password.

### Power-on password

After you set a power-on password, you can enable the unattended-start mode. This locks the keyboard and mouse, but enables the system to start the operating system. The keyboard and mouse remain locked until you type the correct password.

You can use any combination of up to seven characters (A–Z, a–z, 0–9, and blanks) for your power-on password. Keep a record of your password in a secure place. If you forget the power-on password, you can regain access to the appliance server through one of the following methods:

- If an administrator password is set, type the administrator password at the power-on prompt. Start the Configuration/Setup Utility program, and change the power-on password.
- Change the position of the password override switch or clear CMOS jumper.
- Remove the battery and then install the battery.



The following illustration shows the location of the password override switch on a model 8654 appliance server, switch 4 of switch block 1, on the system board.

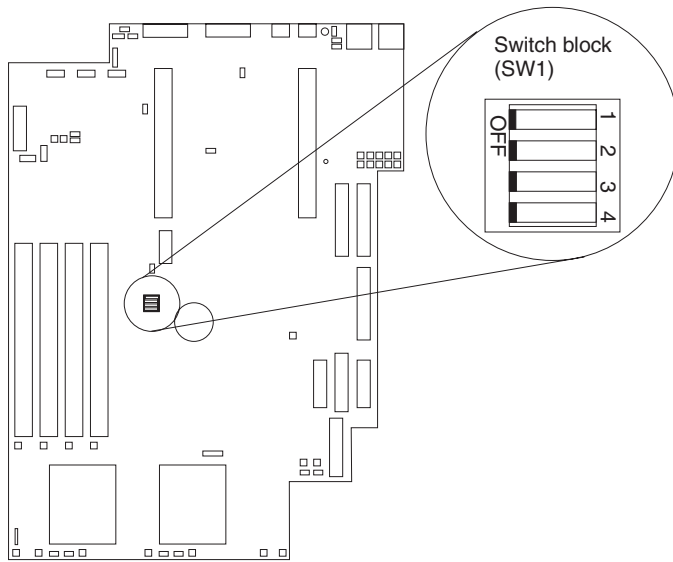


Figure 7. The password override switch on the model 8654

The following illustration shows the location of the CMOS jumper on a model 8672 appliance server system board.

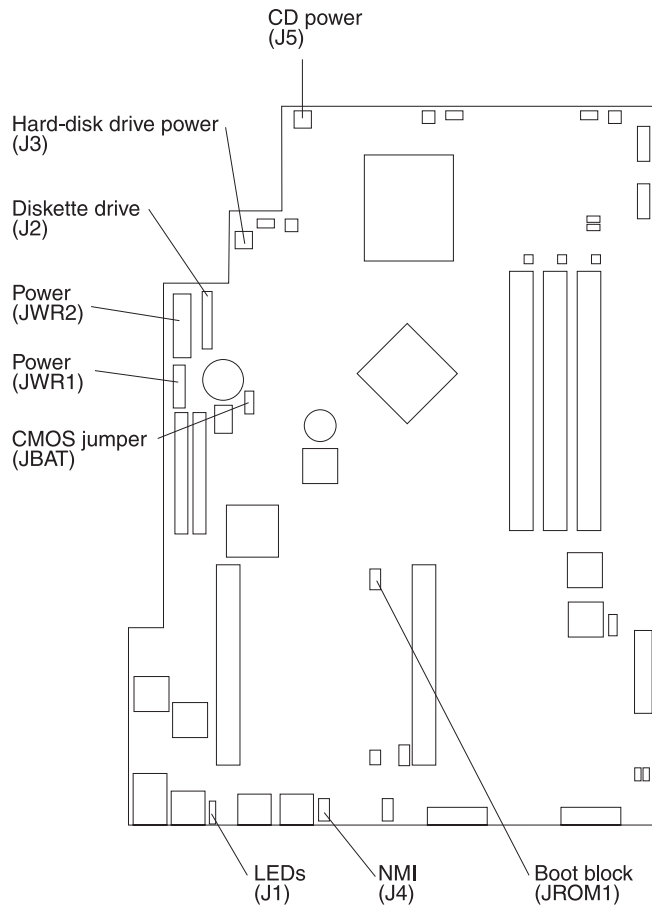


Figure 8. The password override jumper on the model 8672

To set the password override switch or jumper:

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and peripheral devices and disconnect all external cables and power cords; then, remove the cover. See “Removing the cover” on page 56.
3. To set the override switch or jumper for your model:
  - 8654, Toggle switch 4 on switch block 1 on the system board to the position opposite the current position. This clears the power-on password for one boot cycle.
  - 8672, If the CMOS jumper is installed, remove it to clear the CMOS and reset the power-on password. If the CMOS jumper is not installed, then installing it will clear the CMOS and reset the power-on password.

**Note:** This means that you can now start or power-on the appliance server one time without having to use the power-on password. But if you do not use the Configuration/Setup Utility program to change or delete the password, the next time you start the appliance server, the original power-on password will be reinstated.

4. Connect the appliance server to a power source, keyboard, monitor, and mouse.
5. Restart the appliance server.

**Note:** You can now start the Configuration/Setup Utility program and either delete the old password or set a new power-on password.

### **Administrator password**

Select this choice to set an administrator password. The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords and enable a power-on password to be changed by the user.

**Attention:** If an administrator password is set and then forgotten, it cannot be overridden or removed. You must replace the system board.

The following table provides a summary of the password features.

Table 4. Power-on and administrator password features.

Type of password	Results
Power-on password	<ul style="list-style-type: none"> <li>• Type the password to complete the system startup.</li> <li>• All choices are available on the Configuration/Setup Utility main menu.</li> </ul>
Administrator password	<ul style="list-style-type: none"> <li>• No password is required to start the system.</li> <li>• Type the password to access the Configuration/Setup Utility program.</li> <li>• All choices are available on the Configuration/Setup Utility main menu.</li> </ul>
Administrator <i>and</i> power-on password	<ul style="list-style-type: none"> <li>• You can type either password to complete the system startup.</li> <li>• The administrator password provides access to all choices on the Configuration/Setup Utility main menu. You can set, change, or delete both the administrator and power-on passwords and allow a power-on password to be changed by the user.</li> <li>• The power-on password provides access to a limited set of choices on the Configuration/Setup Utility main menu. This limited access might include changing or deleting the power-on password.</li> </ul>

## Wake on LAN

A network administrator can use the Wake on LAN feature to turn on the xSeries 130 appliance server from a remote location. When Wake on LAN is used with network-management software, many types of functions, such as data transfers, software updates, and POST or BIOS updates to your appliance server can be initiated remotely.

**Note:** If the appliance server power cord is plugged into a surge protector or power strip, make sure that when you turn off power you use the appliance server power switch and not the surge protector power strip switch. Otherwise, the Wake on LAN feature will not work.

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## Using the SCSISelect utility program

SCSISelect is a built-in, menu-driven configuration utility program that you can use to:

**Note:** The SCSISelect utility program is available for the model 8654 only.

- View the default SCSI IDs
- Locate and correct configuration conflicts
- Perform a low-level format on a SCSI hard disk

The following sections provide the instructions needed to start the SCSISelect Utility and descriptions of the menu choices available.

## Starting the SCSISelect utility program

To start the SCSISelect utility program:

**Note:** To use the SCSISelect utility you need to have a keyboard, mouse, and monitor connected to the appliance server.

1. Turn on the appliance server.
2. When the <<< Press <CTRL><A> for SCSISelect™ Utility! >>> prompt appears, press Ctrl+A.

**Note:** If an administrator password has been set, a prompt appears asking you to type the password to start the SCSISelect Utility program.

3. Use the arrow keys to select a choice from the menu.
  - Press Esc to return to the previous menu.
  - Press the F5 key to switch between color and monochrome modes (if your monitor permits).
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter.

## SCSISelect menu options

The following choices appear on the SCSISelect Utility menu:

- **Configure/View Host Adapter Settings**

Select this choice to view or change the SCSI controller settings. To reset the SCSI controller to its default values, press F6; then, follow the instructions that appear on the screen.

You can view or change the following controller settings:

- **Host Adapter SCSI ID**

Select this option to be able to view the SCSI controller ID, normally 7.

- **SCSI Parity Checking**

Select this option to be able to view the assigned value of **Enabled**.

- **Host Adapter SCSI Termination**

Select this option to be able to view the assigned value of **Enabled**.

- **Boot Device Options**

Select this choice to configure startable device parameters. Before you can make updates, you must know the ID of the device whose parameters you want to configure.

- **SCSI Device Configuration**

Select this choice to configure SCSI device parameters. Before you can make updates, you must know the ID of the device whose parameters you want to configure.

**Note:** The Maximum Sync Transfer Rate is the transfer rate for Ultra SCSI devices.

- The transfer rate for Ultra3 SCSI LVD devices is 160.0 Mbps.
- The transfer rate for Ultra2 SCSI LVD devices is 80.0 Mbps.
- The transfer rate for Fast SCSI devices is 20.0 Mbps.

- **Advanced Configuration Options**

Select this choice to view or change the settings for advanced configuration options.

- **SCSI Disk Utilities**

Select this choice to view the SCSI IDs that are assigned to each device or to format a SCSI device.

To use the utility program, select a drive from the list. Read the screens carefully before making a selection.

**Note:** If you press Ctrl+A before the selected drives are ready, an Unexpected SCSI Command Failure screen might appear. Restart the appliance server and watch the SCSISelect messages as each drive spins up. After the drive that you want to view or format spins up, press Ctrl+A.



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## Chapter 4. The Advanced Appliance Configuration Utility

The Advanced Appliance Configuration Utility is one way to configure network settings. If you are adding multiple appliance servers to your network, you can use the Advanced Appliance Configuration Utility to configure multiple appliance servers simultaneously.

Use the following general procedure to configure your appliance server:

1. If you have not already done so, designate a mobile computer, workstation, or server to use to manage the network.
2. Install and then start the Advanced Appliance Configuration Utility from the *Supplementary* CD on the workstation (see “Installing and starting the Advanced Appliance Configuration Utility”).
3. If you need to change the language of your operating system, do so now. For more information, see “Changing the language of the operating system” on page 20.
4. Create groups and determine if you want to enable reprovisioning (see “Using the group functions to manage your appliance servers” on page 34 and “Enabling Reprovisioning for an existing group” on page 41).
5. If necessary, add appliance servers to the groups (see “Moving an appliance server into a group” on page 39). You might not need to perform this step if appliance servers have automatically been moved to another group.
6. Configure your Web site and transfer Web content to the appliance server. See the “Appliance setup and configuration Web page” on page 16 for more information.
7. You can now manage your appliance using UM Services or the Advanced Appliance Configuration Utility.

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### Installing and starting the Advanced Appliance Configuration Utility

To install and start the Advanced Appliance Configuration Utility, do the following:

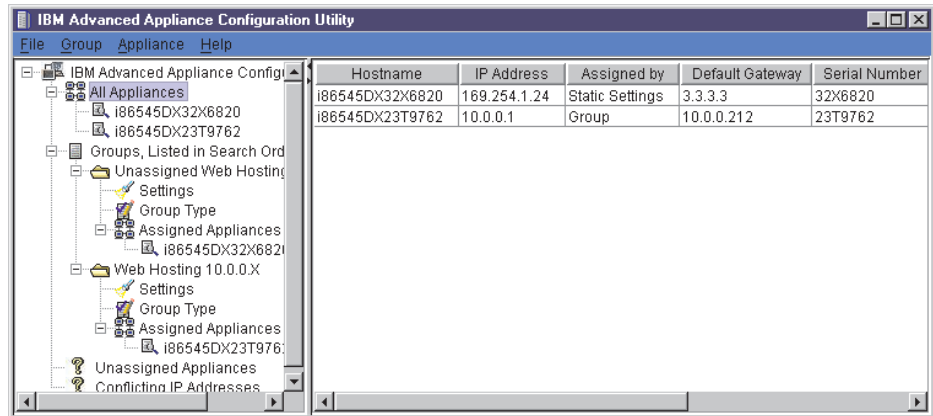
1. Insert the *Supplementary* CD into the CD-ROM drive of your remote Windows workstation designated for managing the network.
2. Run the IAACConfig\setup.exe file, from the *Supplementary* CD to your remote workstation.
3. From the remote workstation you are using to manage the network, go to the Start menu and then open the IBM Advanced Appliance Configuration Utility.

Any IBM xSeries appliance server that is running and is connected to the same physical subnet as the system that is running the Advanced Appliance Configuration Utility console is automatically discovered when you start the Advanced Appliance Configuration Utility. Each appliance appears in the All Appliances list and one of the following lists: the appliance list of the group it belongs to, the Unassigned Appliances list, or the Conflicting IP Address list. A rescan, (see “Rescanning” on page 42) forces an immediate discovery of appliances in the subnet.

#### Notes:

- a. The Advanced Appliance Configuration Utility configures and reports the TCP/IP settings of the first adapter on each appliance server only. The first adapter is the port 1 Ethernet controller. Be sure to connect the built-in Ethernet connector to the same subnet as your system running the Advanced Appliance Configuration Utility.

- b. The Advanced Appliance Configuration Utility console must be running on the same physical subnet as is the appliance server. Only one Advanced Appliance Configuration Utility console should be running at a time.



Proceed to “Using the group functions to manage your appliance servers” to continue using the Advanced Appliance Configuration Utility.

## Using the group functions to manage your appliance servers

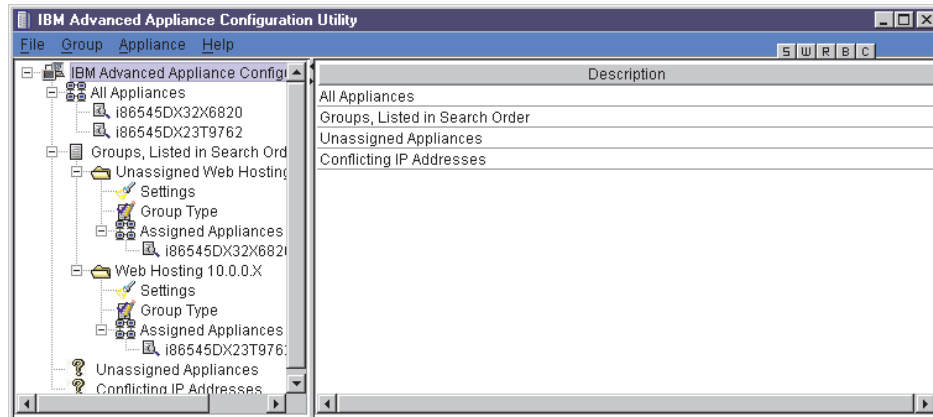
Groups specify the parameters that the Advanced Appliance Configuration Utility uses to automatically categorize discovered appliance servers and to configure them with the network settings of their group. Group types are defined by appliance type or purpose. Each group can contain only one type of appliance. The Advanced Appliance Configuration Utility uses groups to logically list appliance servers and to automatically apply predetermined network settings to newly installed and discovered appliance servers. You can drag and drop appliance servers from one group to another as long as the appliance type matches the group.

Appliance servers can belong only to a group that matches the type of appliance server. If the Advanced Appliance Configuration Utility is configured to not assign settings, it does not configure any of the network settings for the appliance server. You need to configure the network settings from another service such as DHCP. In either case, groups provide a collection of appliance servers that:

- Display network settings
- Provide a shortcut to the UM Services
- Provide a common reprovisioning capability

If the appliance network settings are configured by a method other than using the Advanced Appliance Configuration Utility, the appliance server is still discovered, and it joins the first group that matches the appliance. If no matching group exists, the appliance server is listed in the Unassigned Appliances list. The Advanced Appliance Configuration Utility window lists the following items:





- **All appliances**  
Every discovered appliance server is listed under all appliances, and also in one of the following:
- **Groups, Listed in Search Order**  
This view shows all groups that are defined, with appliance servers that are assigned to each group nested beneath the group name in the Tree view. The purpose of the appliance is defined by a group so that all appliance servers appearing in a group are of the same type.  
  
The IBM Advanced Appliance Configuration Utility automatically assigns one IP address per appliance server, using available addresses assigned within the group type. When a group IP address range is exhausted, the Advanced Appliance Configuration Utility no longer manages the network settings of subsequently discovered appliance servers. In this case, because the xSeries 130 appliance servers come with DHCP enabled by default, the network settings are configured by DHCP.  
  
When an appliance is discovered on the network, the Advanced Appliance Configuration Utility searches defined groups. Appliances are then automatically added to the first group that matches the purpose of the appliance server. The order in which groups appear is important in the appliance discovery process, because an appliance is assigned to the first matching group that it discovers. To adjust the search order, right-click on a group and use up or down to adjust its position within the group list.
- **Unassigned Appliances List**  
Any discovered appliance servers that do not match any existing group join the Unassigned Appliances list.
- **Conflicting IP Addresses**  
If the IP Address of the discovered appliance has the same address of an already discovered appliance and there is no group defined to automatically assign a different address, the appliance server is placed in the conflicting address list.

## Creating a group

When you create a group, appliance servers that match the appliance type of the group and are members of the Unassigned Appliances list automatically move to that group. To create a group, do the following:

1. Start the Advanced Appliance Configuration Utility. From the Group menu, click **Create Group**. The Advanced Appliance Configuration Utility Group Wizard window opens.
2. Specify a group name. In the **Group Name** field, type a unique name that will identify the group.
3. Select the Appliance Group type. The appliance group determines what purpose an appliance server must serve to be included in the group. You can select one of the following values:
  - All xSeries appliance servers
  - xSeries Network Attached Storage Appliances (this includes the xSeries 150)
  - xSeries Web Hosting Appliances (this includes the xSeries 130 and xSeries 135)
4. If you want this group to manage the network settings of the assigned appliance servers using the Advanced Appliance Configuration Utility, click **Yes**, and then specify the TCP/IP network settings to be used by members of the group. If you do want to use DHCP or some other tool to configure your IP address, click **No** and proceed to step 5.

### **Start IP Address**

This is the lowest IP address in a range of IP addresses that can be automatically assigned to an appliance that is a member of the group.

### **End IP Address**

This is the highest IP address in a range of IP addresses that can be automatically assigned to an appliance that is a member of the group.

### **Subnet Mask**

This is the subnet mask value to automatically assign for members of the group.

### **Default Gateway**

This is the IP address for the default gateway to automatically assign for members of the group (optional).

### **DNS Address**

This is the IP address of the Domain Name Server (DNS) to automatically assign for members of the group (optional). Up to three entries are available.

### **Use Current Host Name**

This is the host name of the appliance server, and it is not automatically assigned.

### **Use "i"Prefix and Model-Serial number**

The host name is set to use an "i" prefix and the model and serial number of the appliance server. This is the default name that is preconfigured on xSeries 130 appliance servers. For example, an appliance server with the model number of 86545DX and serial number of 23T9762 yields a host name of i86545DX23T9762.

### **Use Prefix-IP Address**

A user-specified prefix is combined with the appliance server IP address to generate the host name. Periods (.) are invalid in a host name, and are replaced with hyphens (-). When you supply the prefix, remember that the total length of the host name cannot exceed 15 characters.

### Domain Name

Enter the DNS domain name to assign to appliance servers. On Windows systems this is known as the DNS Suffix Search. This field is optional.

5. Click to **enable reprovisioning** and complete the File Transfer Protocol (FTP) setup information. To reprovision your appliance servers from the FTP server, complete the following fields:

### Remote Host Name

This is the host name or IP address of the FTP server.

### Remote Directory

This is the directory to use on the FTP server for reprovisioning images.

### FTP User Name

This is the username to use when logging into the FTP server.

### FTP Password

This is the password to use when logging into the FTP server.

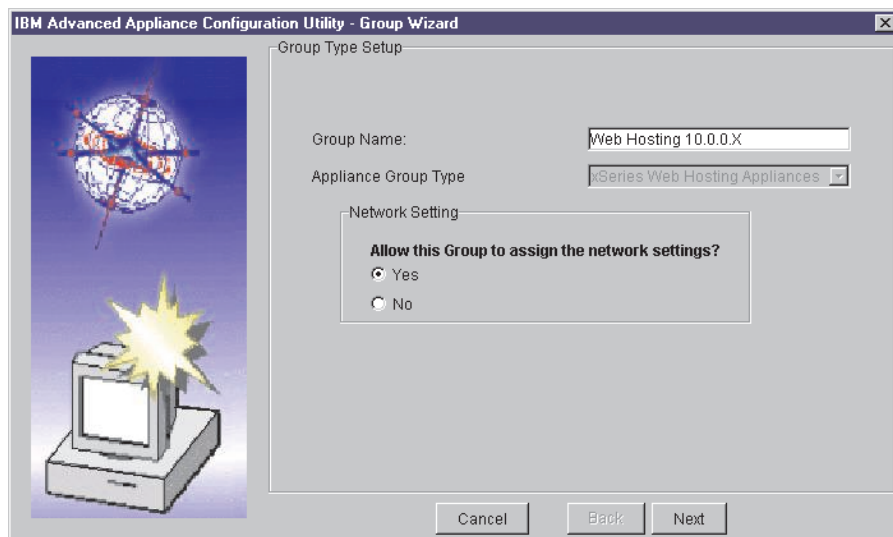
6. Click **Finish**.

When groups are defined, go to “Using the Assigned by First Matching Group function” on page 39 or “Moving an appliance server into a group” on page 39. When finished, you can go to the appliance Web page to complete the appliance server configuration process (see “Starting UMS using the Advanced Appliance Configuration Utility” on page 43). You can then use the Advanced Appliance Configuration utility to edit groups, move appliances, or you can use other features of the Advanced Appliance Configuration Utility such as reprovisioning.

## Editing a group

You can modify a group and enable reprovisioning for a group using the edit group feature. If you edit a group and make changes to the host name or DNS domain name, you need to start the appliance server again for the changes to take effect. To make changes to an existing group, do the following:

1. From the Groups listed in Search order list, highlight the group that you want to change.
2. Open the Group menu, and click **Edit Group**. Make the changes that you want. You can edit any field for the group except the group type.



**Note:** Changes you make to a group do not apply to all appliance servers. Changes apply only to appliances that have network settings assigned by the group. See also “Editing appliance server settings” on page 40.

3. If you want this group to manage the network settings of the assigned appliance servers using the Advanced Appliance Configuration Utility, click **Yes**, and then specify the TCP/IP network settings to be used by members of the group. If you do want to use DHCP or some other tool to configure your IP address, click **No** and proceed to step 6 on page 37.

**Start IP Address**

This is the lowest IP address in a range of IP addresses that can be automatically assigned to an appliance that is a member of the group.

**End IP Address**

This is the highest IP address in a range of IP addresses that can be automatically assigned to an appliance that is a member of the group.

**Subnet Mask**

This is the subnet mask value to automatically assign for members of the group.

**Default Gateway**

This is the IP address for the default gateway to automatically assign for members of the group (optional).

**DNS Address**

This is the IP address of the DNS Address to automatically assign for members of the group (optional). Up to three entries are available.

**Use Current Host Name**

This is the host name of the appliance server and it is not automatically assigned.

**Use "i"Prefix and Model-Serial number**

The host name is set to use an "i" prefix and the model and serial number of the appliance server. This is the default name that is preconfigured on xSeries 130 appliance servers. For example, an appliance server with the model number of 86545DX and serial number of 23T9762 yields a host name of i86545DX23T9762.

**Use Prefix-IP Address**

A user-specified prefix is combined with the appliance server IP address to generate the host name. Periods (.) are invalid in a host name, and are replaced with hyphens (-). When you supply the prefix, remember that the total length of the host name cannot exceed 15 characters.

**Domain Name**

Enter the DNS domain name to assign to appliance servers. On systems that are running Windows, this is the DNS Suffix Search. This field is optional.

4. Click to **enable reprovisioning**. Complete the FTP setup information. To reprovision your appliances from the FTP server, complete the following fields:

**Remote Host Name**

This is the host name or IP address of the FTP server.

**Remote Directory**

This is the directory to use on the FTP server for reprovisioning images.

**FTP User Name**

This is the username to use when logging into the FTP server.

**FTP Password**

This is the password to use when logging into the FTP server.

5. Click **Finish**.

## Moving an appliance server into a group

To move an appliance server into a group, do the following:

1. Using the mouse, select the appliance icon. When you drag the icon, it changes and displays where you can drop the appliance server.
2. Drag the appliance icon into the group that you want. You can drop the appliance icon when you are over the group name or the Assigned Appliances list that belongs to the group.

If the group is configured to manage network settings and there is an IP address available from the IP address range of the group, the Advanced Appliance Configuration Utility automatically configures the network settings of the appliance server. Otherwise, the network settings are not configured by the Advanced Appliance Configuration Utility and no changes are made. If you need to make changes to the settings for your appliance server after it is assigned to a group, see “Editing appliance server settings” on page 40.

## Removing appliance servers from groups

Use the remove appliance option to delete an appliance from the Advanced Appliance Configuration Utility console database. Removing an appliance server that is no longer in use enables the IP address that was assigned to the appliance server to be allocated to another appliance server. You can also remove an appliance server from a group and then rescan the network to add it to an appropriate group that appears higher in the group list.

**Note:** If the appliance server you are trying to delete does not respond when you highlight it and select delete, it is automatically deleted. However, if you attempt to delete an active appliance server, a warning message displays.

To remove an appliance server, highlight and right-click the appliance server; then, from the menu, click **Remove Appliance**.

## Using the Assigned by First Matching Group function

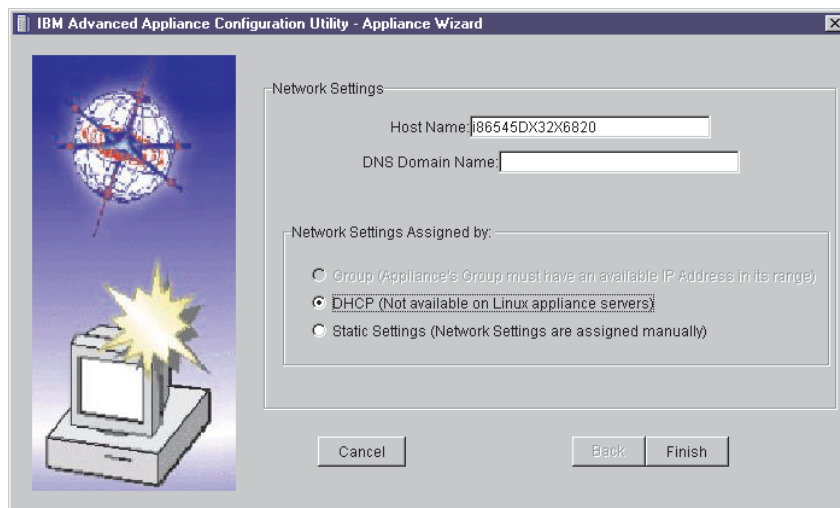
The Assigned by First Matching Group function enables you to set appliance servers to join the first matching group. You can move appliance servers to the group that you want by using a drag-and-drop method or by right-clicking the unassigned appliance server and then clicking **Assign by First Matching Group**. To assign an appliance server to the first matching group, do the following:

1. Right-click the group to which you want to move the appliance server.
2. Click **Move Up in List** to move the selected group up in the list of groups.
3. Repeat steps 1 and 2 until the group that you want to add the appliance server to appears above the group that currently contains the appliance server.
4. Right-click the appliance server icon that you want to move to another group, and then click **Assign by First Matching Group**. The appliance server moves to the group that it matches.

## Editing appliance server settings

You can make changes to your appliance server network settings. To change network settings, do the following:

1. Highlight the appliance icon that you want to change, and click **Edit Appliance**.



2. Select if you want the network settings assigned by **Group**, **DHCP**, or by **Static Settings**. If you select **Static Settings**, go to step 3. If you select **DHCP** or **Group** go to step 4.

**Note:** If you select **DHCP** or **Static Settings** the appliance server remains in the group but any changes made to the group are not made to the appliance server.

3. Enter the TCP/IP settings for the appliance server.

### IP Address

The IP address assigned to the appliance server.

### Subnet Mask

The subnet mask value assigned to the appliance server.

### Default Gateway

The IP address for the default gateway assigned to the appliance server (optional).

### DNS Address

The IP address of the Domain Name Server (DNS) assigned to the appliance server (optional). Up to three entries are available.

4. Click **Finish**.

**Note:** If you edit the host name or DNS domain name for the appliance server, you need to restart the appliance server for the changes to take effect.

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## Reprovisioning your appliance server

Reprovisioning enables you to easily change the function of an appliance server. You can also restore an image remotely to appliance servers. The create and apply reprovisioning features are available only to appliance servers that belong to a group with reprovisioning enabled. Using reprovisioning, you can do the following to your appliance server:

- Create an appliance image
- Apply an appliance image
- Restore factory settings

**Note:** Reprovisioning does not affect the data on your appliance server; only the operating system on the appliance server.

## Enabling Reprovisioning for an existing group

If you enable a group to support reprovisioning, you can create and apply appliance server images.

**Notes:**

1. When you are in the process of reprovisioning an appliance, the icon next to the appliance changes to an under construction icon.
2. The history tab of the appliance server records the results of a reprovision action. Check this tab to ensure that the operation completed successfully.

To enable reprovisioning for an existing group, do the following:

1. Select the group for which you want to enable reprovisioning.
2. Highlight and right-click on the group for which you want to enable reprovisioning; then, click **Edit Group**.
3. Click **Next** until the reprovisioning window opens, and select **Enable Reprovisioning**.
4. Set the FTP settings.

**Remote Host Name**

This is the host name or IP address of the FTP server.

**Remote Directory**

This is the directory to use on the FTP server for reprovisioning images.

**FTP User Name**

This is the username to log in as on the FTP server.

**FTP Password**

This is the password to use when logging into the FTP server.

5. Click **Finish** to return to the main window.

**Note:** When you create an image for reprovisioning, it is saved as the group name and model number. Although multiple models of appliance servers may belong to a group, only images created from the same model can be applied. This prevents you from applying the image to the wrong appliance server.

## Creating an appliance image

The Create Appliance Image function makes an image of the operating system on your appliance server, and saves this image on the FTP server designated for the group.

**Note:** If the history tab of the appliance server shows that the reprovision action failed due to an FTP failure, retry the action. If you continue to have FTP problems, try manually connecting to your FTP server to verify connectivity.

To create an appliance image, do the following:

1. Select the appliance server from which you want to create an image.
2. From the Appliance menu, click **Create Appliance Image**.
3. Click **Yes**.

## Applying an appliance image

The Apply Appliance Image function replaces an image of the operating system on your appliance server with an image from the FTP server designated for the group.

**Note:** If the history tab of the appliance server shows that the reprovision action failed due to an FTP failure, retry the action. If you continue to have FTP problems, try manually connecting to your FTP server to verify connectivity.

To apply an appliance image, do the following:

1. Select the appliance server to which you want to apply the image.
2. From the Appliance menu, click **Apply Appliance Image**.
3. Click **Yes**.

## Restoring a factory image

Reprovisioning also enables remote restoration of the original factory image to the appliance by reapplying the factory image from the local image on the appliance. Because an FTP server is not involved, this ability is available regardless of whether or not the appliances belong to a group. To restore the factory image, do the following:

1. Select the appliance server to which you want to restore the image.
2. From the Appliance menu, click **Restore Factory Image**.
3. Click **Yes**.

---

## Rescanning

The Advanced Appliance Configuration Utility detects appliance servers that are on the same physical subnet as the Advanced Appliance Configuration Utility console. Appliance servers that can communicate with the console have a file/magnifying glass icon; those that are not responding have an X on a red circle icon.

The Advanced Appliance Configuration Utility does not automatically detect if an appliance server has failed. If you suspect that an appliance server has failed, rescan the network to update the icons. To Rescan the network, from the File menu, click **Rescan Network**.



---

## Exporting and importing the database

The server database of the Advanced Appliance Configuration Utility Console contains group definitions and discovered appliance server information. When the appliance server starts, it reads the database file and updates the file automatically. To import or export a configuration database, do the following:

1. From the File menu, click **Import configuration** or **Export configuration**.
2. Type the file name (the exported file is an ASCII based text file). If a file name is specified, all file names are relative to the directory where the Advanced Appliance Configuration Utility is installed.

### Notes:

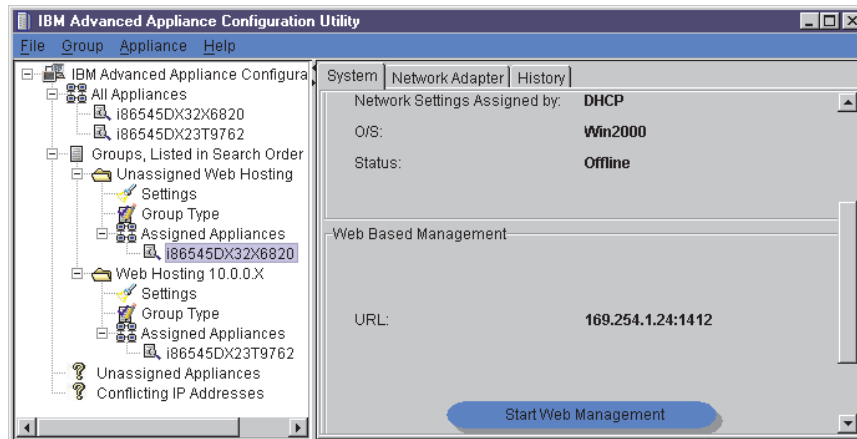
- a. The remote workstation that is running the Advanced Appliance Configuration Utility console automatically maintains a copy of the database (ServerConfiguration.properties) in the Advanced Appliance Configuration Utilities installed directory. To remove previous configuration data, close the Advanced Appliance Configuration Utility, delete this file, and then start the utility again. When you start again, all previously configured groups are deleted. The Advanced Appliance Configuration Utility discovers connected appliances and their network settings.
- b. As a precaution, you cannot export to an already existing file.

---

## Starting UMS using the Advanced Appliance Configuration Utility

You can use the Advanced Appliance Configuration Utility to start UM Services on your xSeries 130 appliance server. To use the Advanced Appliance Configuration Utility console to start UM Services on an appliance server, do the following:

1. Highlight and click the appliance server.
2. Click **Start Web-Based Management**.



Your default Web browser starts, starting the UM Services console automatically.

3. Log in to the UM Services Web page with the username administrator and password password.

For more information on using UM Services to manage your appliances, see "Configuring the xSeries 130 using Universal Manageability Services" on page 15 or the *Universal Manageability Services User's Guide*, which is included on your *Documentation CD*.



---

## Chapter 5. Advanced System Management for the model 8654

You can set up Advanced System Management (ASM) on the model 8654 only. To configure the ASM processor, you must use the Advanced System Management Firmware Update utility program on the *Supplementary CD*.

---

### Creating and installing the ASM Firmware update diskette

The *Supplementary CD* contains a utility that enables you to configure your ASM hardware. The ASM hardware is preinstalled on all model 8654 appliance servers. To configure ASM, you must be at your appliance server. To create the diskette, do the following:

**Note:** This diskette affects the IBM Advanced System Management software only. It does not affect any device drivers.

To install the software on this diskette, do the following:

1. On any workstation, insert a formatted blank diskette into the disk drive.
2. Insert the *Supplementary CD* into the CD-ROM drive of the workstation and run the `\SystemTools\8654\ASMutil\32p0068.exe` program. When prompted specify A: as the location to extract to. This creates a bootable ASM Firmware update diskette.
3. Connect the C2T cable to the back of your server; then, connect a keyboard, monitor, and mouse.
4. Insert the new diskette in the diskette drive of the appliance server.
5. Restart your appliance server; then, press F1 to access the Configuration/Setup Utility program. Use the Configuration/Setup Utility program to configure the diskette drive as the first startup device. See "Using the Configuration/Setup Utility program for the xSeries 130" on page 22. Save your settings and exit to restart your server.
6. After your server starts and the main menu appears, select **Configuration Settings** and press Enter. Online help is available for each option by pressing F1 while the option is highlighted. General help is available by pressing F1 from one of the Help windows. To select an option, highlight it and then press Enter.
7. Select **General Settings** and press Enter.
8. Type a name and number for the Advanced System Management processor of your server in the **Name** and **Number** fields. These values can be up to 15 characters long.

**Notes:**

- a. The Name and Number designations apply to the Advanced System Management processor and not to the server.
  - b. Designate the Advanced System Management processor with names and numbers that correspond to the server designations to which they apply.
9. Press F6 to save the values and return to the main option menu. To return to the main option menu without saving, press Esc.
  10. When you finish using the utility, select **Exit** from the main menu and press Enter.
  11. When prompted, remove the diskette from the diskette drive and press Enter to restart your server.
  12. When the server starts again, press F1 to access the Configuration/Setup Utility program. Change the first starting device from the diskette drive to the CD-ROM drive. Save your settings and exit to restart your server.

---

## The xSeries 130 ASM Firmware Update diskette menu

The *xSeries 130 Advanced System Management Firmware Update* diskette updates the IBM Advanced System Management software only. It does not affect any device drivers, and you should not update the device drivers. You can configure the following:

- **Alert Setting** to enable or disable alert functions.
- **Dial In/Out** settings.
- **General Settings**, including the Name and Number that identify this ASM hardware, the date and time reported by the ASM hardware, assorted time-out values, and schedule a time for the system to be powered up.
- **Modem Settings**.
- **Hardware Status and Information**
- **Configuration Settings**
- **Update System Management firmware**
- **Exit**

Online help is available for each option by pressing F1 while the option is highlighted. General help is available by pressing F1 from one of the help windows. To select an option, highlight it and then press Enter.

### Hardware Status and Information

Select **Hardware Status and Information** for information on the current state of your ASM hardware. When you finish viewing this information, press Esc to return to the main option menu.

### Configuration Settings

Select **Configuration Settings** to view or change the configuration settings of your ASM hardware. Use this option to configure the following settings:

- Alert Settings
- Dial In/Out Settings
- General Settings
- Modem Settings

#### Alert Settings

Use this option to enable or disable all critical, noncritical, and system alerts supported by your ASM hardware. Use the arrow keys and the Tab key to move between the fields. Use the Left Arrow key and Right Arrow key to enable or disable each of the alerts. For online help, press F1. When you have finished, press F6 to save and return to the main option menu. To return to the main option menu without saving, press Esc.

#### Dial In/Out Settings

This option consists of two parts: Dial In (used to configure dial in settings) and Dial Out (used to configure dial out settings). To use Dial In, use the Tab key or the arrow keys to move the cursor to **User Profile to Configure**. Then use the left and right arrow keys to select a User Profile. Once you have selected a User Profile, you can set the following values:

- Login ID
- Password
- Dialback (enable or disable)
- Number (used for dialback only)
- Read Only Access (enable or disable)
- Dial In (enable or disable)
- Dial In Delay (minutes)

When finished, press F6 to save and return to the main option menu. To return to the main option menu without saving, press Esc.

To use Dial Out, use the Tab key or the arrow keys to move the cursor to **User Profile to Configure**. Then use the Left Arrow key and Right Arrow key to select a User Profile. Once you have selected a User Profile, you can set the following values:

- Login ID
- Password
- Enable or disable the currently selected entry
- Number
- PIN
- Connection Type (numeric, alphanumeric, serial)
- Description
- Dialout Retry Limit
- Dialout Number Spacing
- Dialout Retry Delay

When you finish, press F6 to save and return to the main option menu. To return to the main option menu without saving, press Esc.

## **General Settings**

Use this option to set the identifying name and number for the ASM hardware; set the time and date of the ASM clock, schedule a time and date for the system to be automatically powered on, and to specify POST, loader, and operating-system timeout values or the power off delay value.

The name and number help you identify these systems on your network. The name and number values can be up to 15 characters in length.

Use the arrow keys and the Tab key to move between the fields. For online help, press F1. When you have finished entering the values, press F6 to save the values and return to the main option menu. To return to the main option menu without saving, press Esc.

## **Modem Settings**

Use this option to configure the modem that is used by your ASM hardware. For more information, see the documentation that comes with your modem.

## **Update System Management Firmware**

Use this option to update the firmware for the IBM Advanced System Management processor.

## **Exit**

Use this menu item to exit from the xSeries 130 Advanced System Management Firmware Update program.



---

## Chapter 6. Installing options

This chapter provides instructions for adding options to your appliance server. Some option-removal instructions are provided in case you need to remove one option to install another. For a list of supported options for your appliance server, see the ServerProven<sup>®</sup> list at <http://www.ibm.com/pc/compat> on the World Wide Web.

---

### Before you begin

To install options in your appliance server, begin by reading the following information.

- Become familiar with the safety and handling guidelines specified under “Handling static-sensitive devices” on page 50, and read the safety statements in “Safety” on page vii. These guidelines will help you work safely while working with your appliance server or options.
- Have a keyboard, monitor, and mouse available.
- Make sure that you have an adequate number of properly grounded electrical outlets for your appliance server, monitor, and any other options that you intend to install.
- Back up all important data before you make changes to disk drives.
- Have a small, flat-blade screwdriver available.
- Before you install an optional device in your appliance server, verify that IBM supports that device on your model. You can view the list of supported devices for your model at: <http://www.ibm.com/pc/us/compat>.

### System reliability considerations

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

- Each of the drive bays has either a drive or a filler panel installed.
- The cover is in place during operation, or is removed for no longer than 30 minutes while the appliance server is operating.
- There is space around the appliance server to allow the appliance server cooling system to work properly. Leave approximately 127 mm (5 in.) of space around the front and rear of the appliance server.
- A failed fan is replaced within 48 hours.

## Handling static-sensitive devices

**Attention:** Static electricity can damage electronic devices and your system. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them. To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its static-protective package, touch it to an unpainted metal part of the unit for at least two seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your system unit without setting it down. If it is necessary to set the device down, place it on its static-protective packaging. (If your device is an adapter, place it component side up.) Do not place the device on your system unit cover or on a metal table.
- Take additional care when handling devices during cold weather, because heating reduces indoor humidity and increases static electricity.



## Major components of the model 8654 appliance server

The following illustration shows the locations of major components in your model 8654 appliance server.

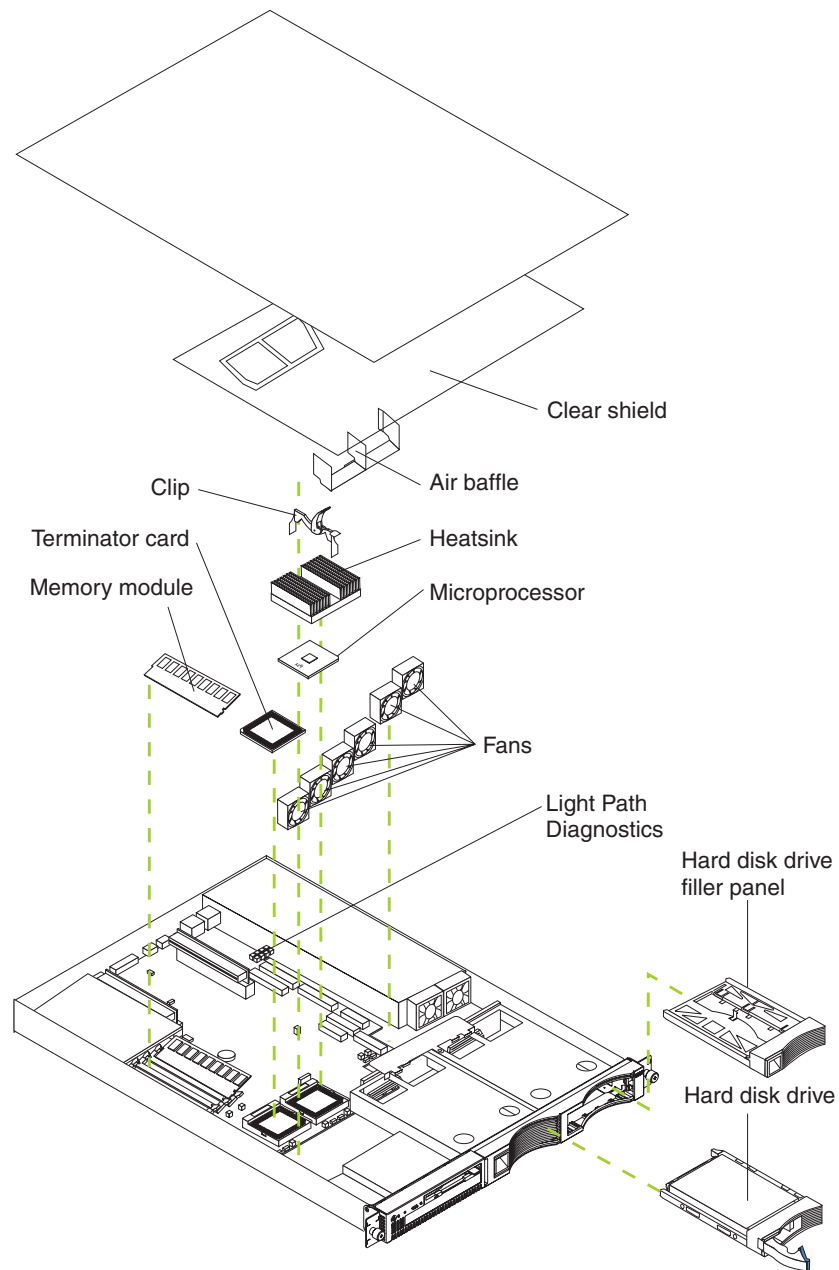


Figure 9. Viewing the major components of the xSeries 130 model 8654

## System board option connectors

The following illustration identifies the connectors on the system board.

### System board jumper blocks

Any jumper blocks on the system board that are not shown in the illustration are reserved. For normal operation of the system, no jumpers should be installed on any of the jumper blocks.

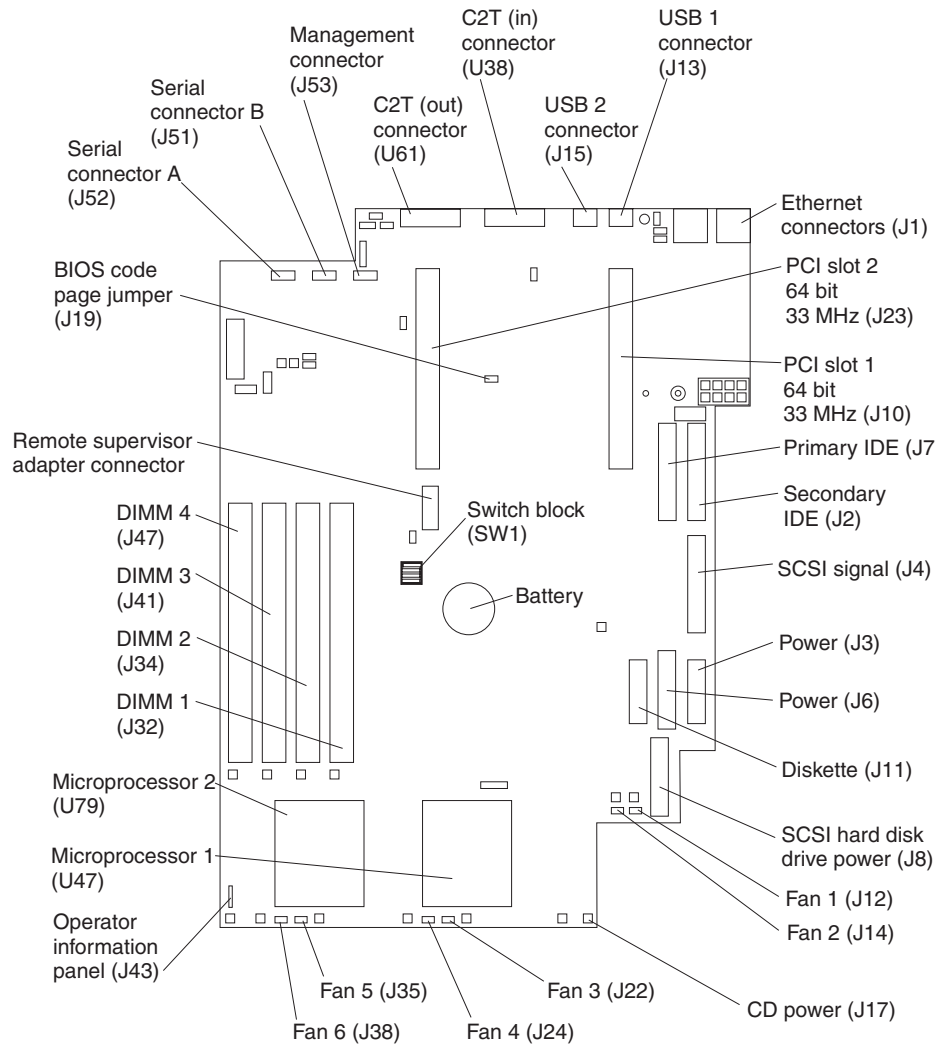


Figure 10. Viewing the system board connectors

## System board switch block

The switch block contains microswitches 1 through 4. Switch 1 is at the top of the switch block and switch 4 is at the bottom. For more information about this switch block see “Power-on password” on page 26.

The following table describes the function for each switch.

Table 5. Switches 1 through 4.

Switch number	Switch description
1	Reserved. The default setting is Off (disabled).
2	Reserved. The default setting is Off.
3	Reserved. The default setting is Off.
4	Bypass power-on password.  When this switch is toggled to the opposite position, the system bypasses the power on password, if one is set. See “Power-on password” on page 26.

## System board LEDs

The following illustration identifies the LEDs on the system board.

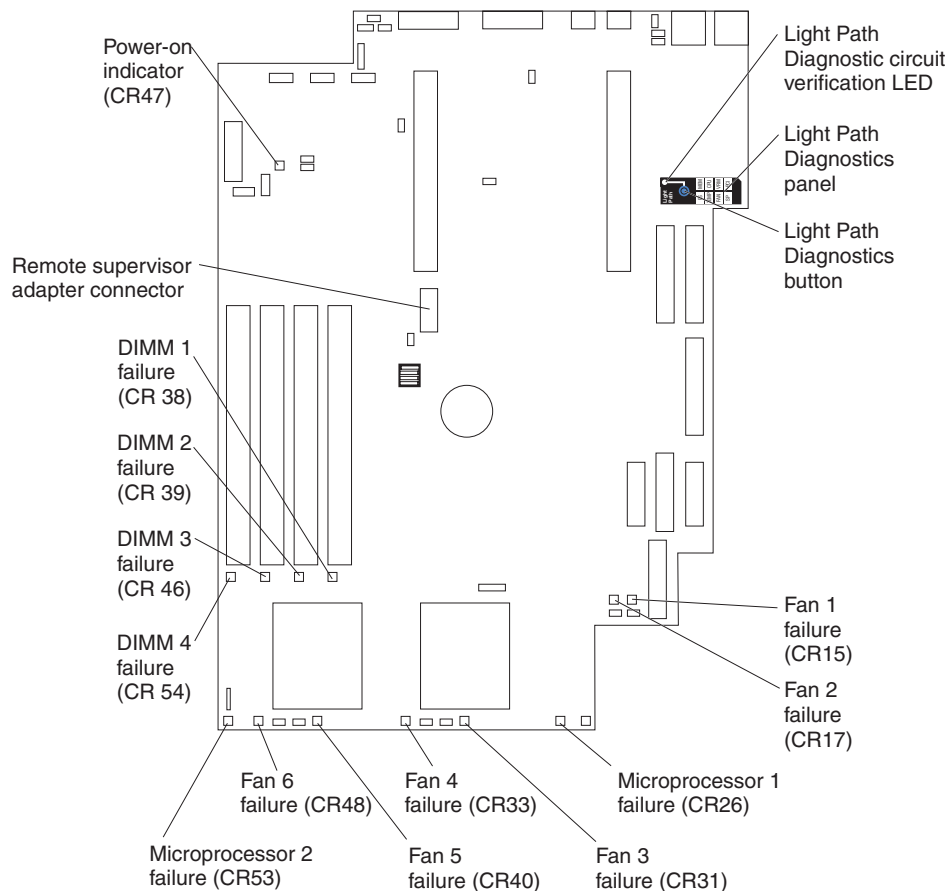


Figure 11. Viewing the system board connectors

## Major components of the model 8672 appliance server

The following illustration shows the locations of major components in your model 8672 appliance server.

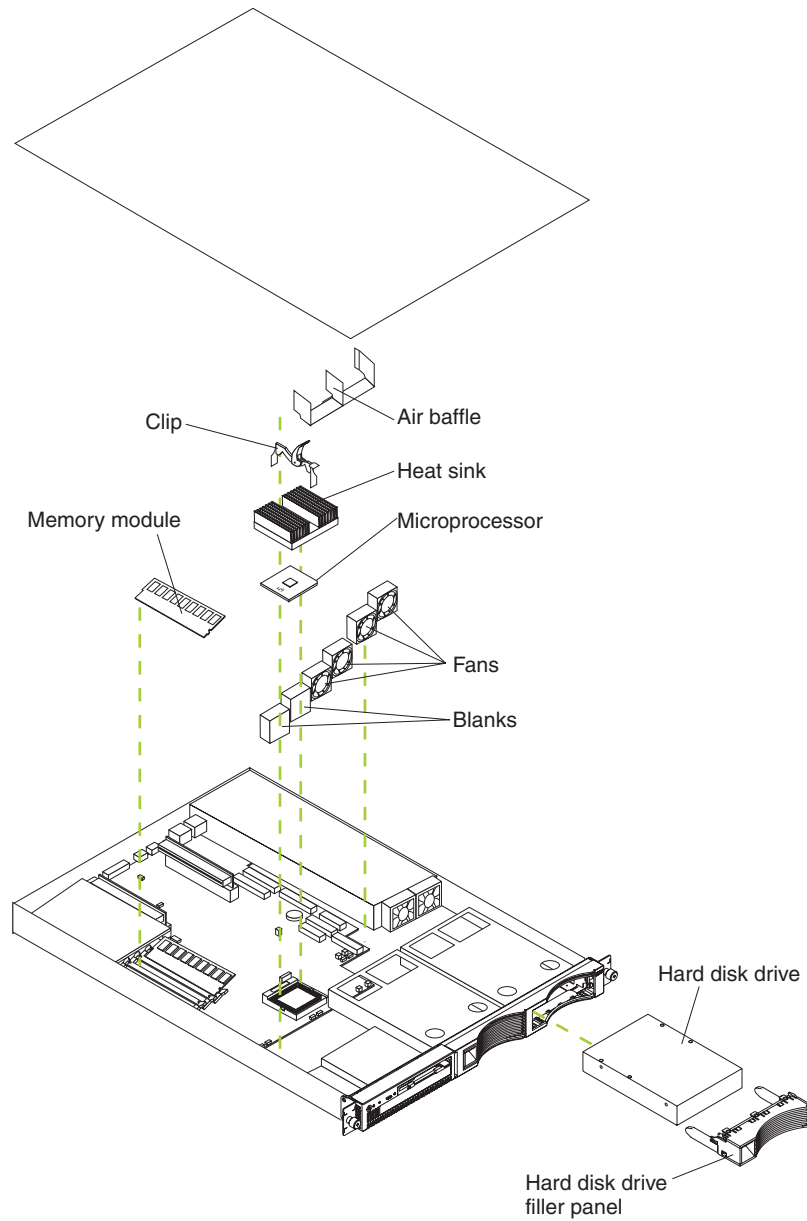


Figure 12. Viewing the major components of the xSeries 130 model 8672

## System board internal cable connectors

The following illustration identifies the internal connectors on the system board.

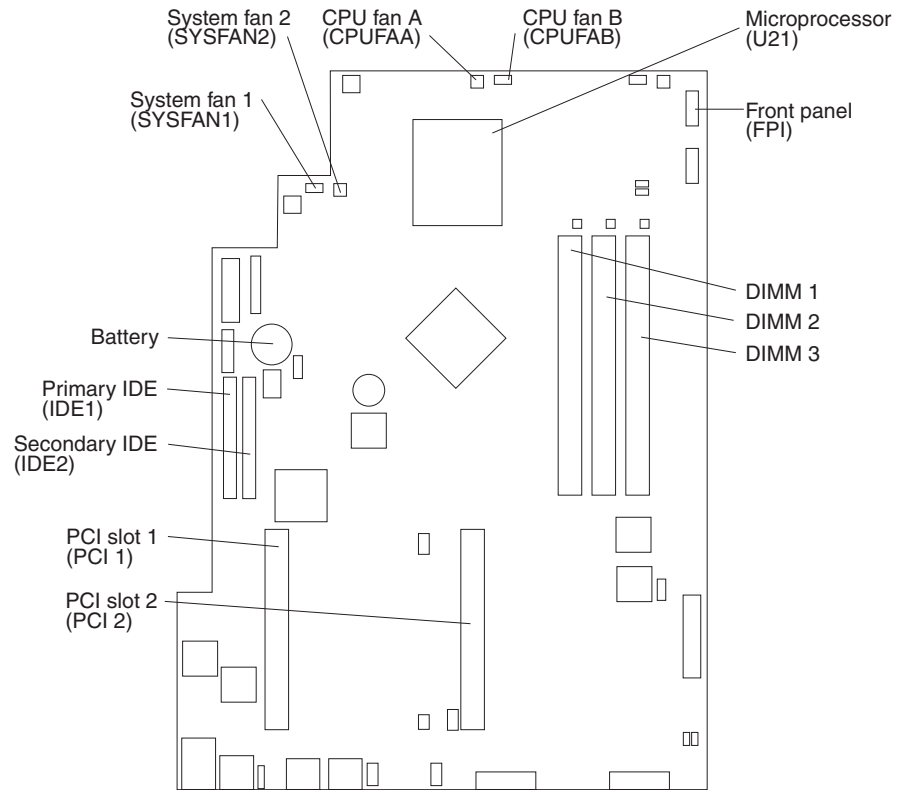


Figure 13. Viewing the system board connectors

## System board jumpers

The following illustration identifies the jumpers on the system board.

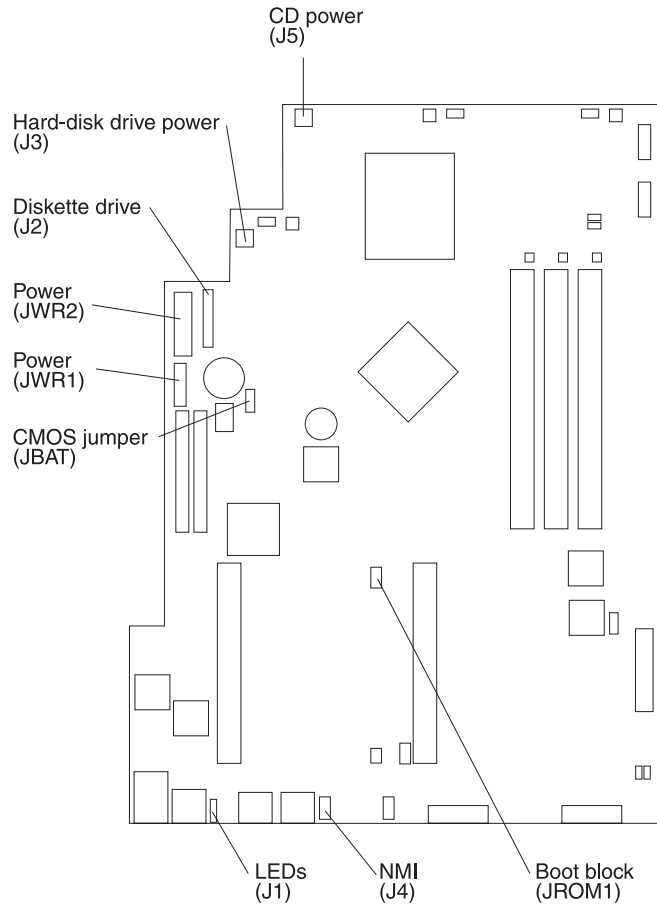


Figure 14. Viewing the system board connectors

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## Removing the cover

Complete the following steps to remove the appliance server cover:

**Note:** If you are installing only a SCSI hard disk drive in a model 8654, you do not need to remove the cover.

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and all attached devices and disconnect all external cables and power cords.
3. If your appliance server is installed in a rack cabinet, remove the appliance server from the rack cabinet.
4. Remove the two screws from the rear of the appliance server.
5. Pull out on the cover-release lever at the back of the appliance server to release the cover.
6. Slide the cover back, then up and off the appliance server.

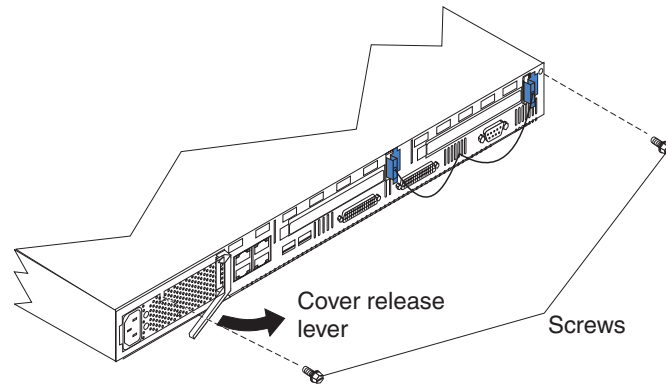


Figure 15. Removing the cover

**Note:** You might need to remove the clear plastic shield to reach some parts in the appliance server. For proper cooling and airflow, replace the clear plastic shield before replacing the cover.

**Attention:** For proper cooling and airflow, replace the cover before turning on the appliance server. Operating the appliance server for extended periods of time (over 30 minutes) with the cover removed might damage appliance server components.

7. Install all options before reinstalling the cover on the appliance server.

---

## Installing hard disk drives

Your appliance server supports two 26 mm (1-in.), slim, 3.5-inch hard disk drives. Model 8654 appliance servers support SCSI hard disk drives, while model 8672 appliance servers support IDE hard disk drives. Before you install a hard disk drive, review the following:

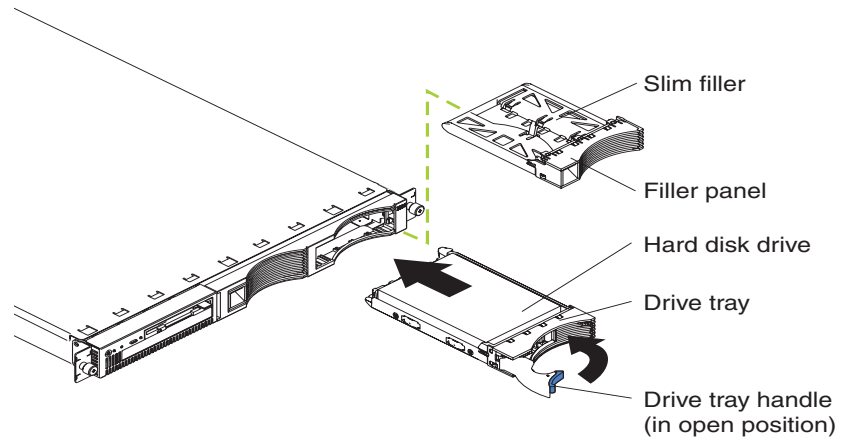
- Inspect the drive or drive tray for any signs of damage.
- To maintain proper system cooling, do not operate the appliance server for more than 2 minutes without either a drive or a filler panel installed in each bay.
- Review the information in “Handling static-sensitive devices” on page 50.
- Check the instructions that come with the drive for more information about installing your drive.

### Installing a SCSI hard disk drive in the model 8654

Complete the following steps to install a SCSI hard disk drive in the model 8654:

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the filler panel from the available hard disk drive bay.

4. Install the new hard disk drive in the drive bay:
  - a. Ensure that the tray handle is open (that is, perpendicular to the drive).
  - b. Align the rails on the drive assembly with the guide rails in the drive bay.
  - c. Gently push the drive assembly into the bay until the drive connects to the backplane.
  - d. Push the tray handle toward the closed position until it locks the drive in place.



**Note:** When you turn on the appliance server, check the hard disk drive status light and activity light to verify that the hard disk drives operate properly.

If the green light flashes rapidly (three flashes per second), the controller is identifying the drive.

5. If you have other options to install, install them now. Otherwise, go to “Installing the cover” on page 68.



## Installing an IDE hard disk drive in the model 8672

Complete the following steps to install an IDE hard disk drive on the model 8672:

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the cover according to “Removing the cover” on page 56.
4. Set the drive to primary (master) or secondary (subordinate), depending on the configuration of your appliance server. See the documentation that comes with the drive for instructions.
5. Remove the filler panel from the hard disk drive bay.
6. Install the new hard disk drive in the drive bay:
  - a. Slide the drive into the bay, with the screw holes in the drive facing up, and align the screw holes in the drive with the screw holes in the appliance server chassis.
  - b. Use a screwdriver to drive the screws into the drive and secure it to the appliance server chassis.

**Note:** You might have to hold the drive up and in place to carefully align the drive with the screw holes in the chassis.

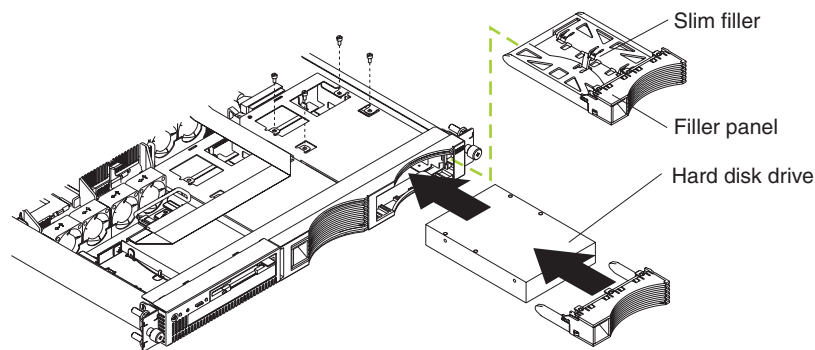


Figure 16. Installing or replacing the hard drive

- c. Connect signal and power cables to the rear of the drive. Be sure to keep the signal cable and power cable clear of the path of the fan behind the drive bay.
7. If you have other options to install, install them now. Otherwise, go to “Installing the cover” on page 68.

## Installing memory

Adding memory to your appliance server is an easy way to improve system performance. You can increase the amount of memory in your appliance server by installing dual inline memory modules (DIMMs). Your appliance server uses a noninterleaved memory configuration, which enables you to add, remove, or replace one DIMM at a time. In an interleaved system you would have to add, remove, or replace memory in sets.

Your appliance server comes with a dual inline memory module (DIMM) installed on the system board in DIMM slot 1.

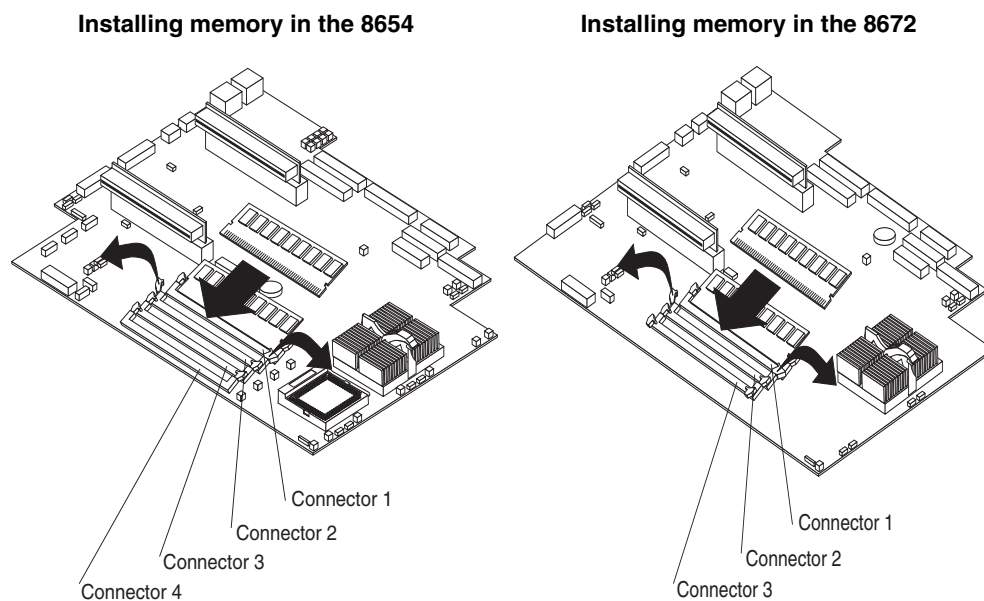


Figure 17. Installing memory

**Note:** Install additional DIMMs in the following order:

- On the model 8672, DIMM connector 2, and then connector 3
- On the model 8654, DIMM connector 2, connector 3, and then connector 4

Complete the following steps to install a DIMM:

**Attention:** When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling static-sensitive devices” on page 50.

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the cover according to “Removing the cover” on page 56.
4. If necessary, remove the PCI adapter in slot 2 for easier access to the DIMM connectors.
5. Touch the static-protective package containing the DIMM to any unpainted metal surface on the appliance server. Then, remove the DIMM from the package.

6. Install the DIMM in the connector.

**Attention:** To prevent damage to the DIMM connectors, do not force the memory module into the connector.

- a. Turn the DIMM so that the index slots align correctly with the connector.

**Note:** The DIMM has two index slots, one in the center and the other on the left half of the DIMM connector edge.

- b. Insert the DIMM into the connector by pressing on both corners of the DIMM at the same time. Be sure to press straight into the connector.

**Note:** When installing a memory module, be sure that no gap exists between the DIMM and the retaining clips. If a gap does exist between the memory module and the retaining clips, remove the DIMM; then, reinsert the DIMM properly.

**Attention:** To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.

7. If you removed the adapter from PCI slot 2, reinstall it.

**Note:** When you start the appliance server for the first time after adding memory, you must have a keyboard, monitor, and mouse connected to the appliance server. The system displays a message indicating that the memory configuration has changed.

- If you installed additional memory, start the Configuration/Setup Utility program, and select **Save Settings**. For more information see “Using the Configuration/Setup Utility program for the xSeries 130” on page 22.
- If you just replaced a failed DIMM, you must start the Configuration/Setup Utility program, select **Advanced Setup**, select **Memory Settings**, highlight the connector or bank of connectors that you want to enable, and then select **Enable**.

8. If you have other options to install, install them now. Otherwise, go to “Installing the cover” on page 68.

---

## Installing adapters in the model 8654

The model 8654 appliance server supports the installation of ServerProven adapters. Your appliance server comes with two peripheral component interconnect (PCI) adapter slots on the system board with riser cards installed in them.

**Note:** Your appliance server also comes with an integrated video controller on the system board. When you install a video adapter in a PCI slot, the appliance server BIOS automatically disables the integrated video controller. This enables the video adapter in the PCI slot to control the video functions for your monitor.

The following illustration shows the location of the PCI expansion slots on the model 8654 system board.

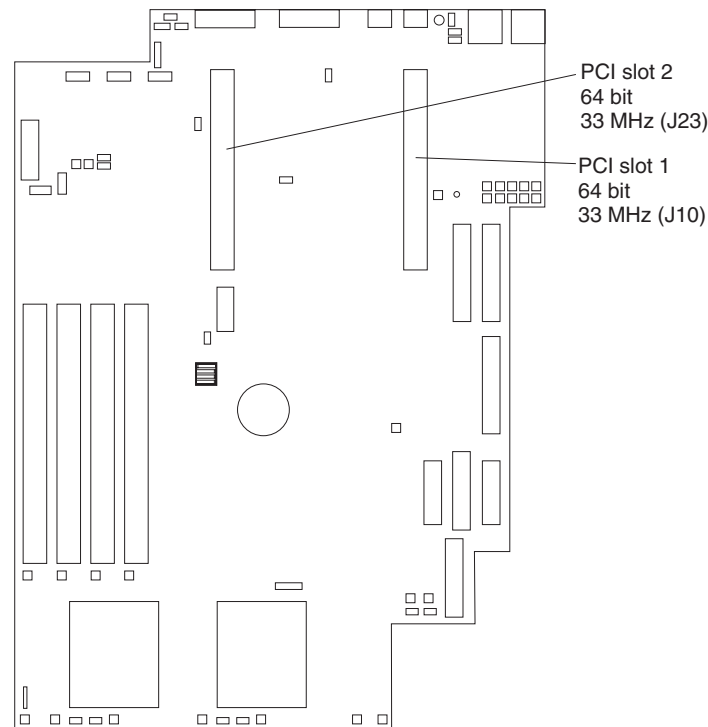


Figure 18. Identifying adapter placement

## Adapter considerations

Before you install adapters in the model 8654, review the following:

- Locate the documentation that comes with the adapter and follow those instructions in addition to the instructions in this chapter. If you need to change the switch settings or jumper settings on your adapter, follow the instructions that come with the adapter.
- You can install 32-bit or 64-bit full-length or half-length adapters in the expansion slots. Full-length adapters are installed in slot 1; half-length adapters are installed in either slot 1 or 2.
- Your appliance server supports 5.0 V and universal PCI adapters; it does not support 3.3 V only adapters.
- Your appliance server uses a rotational interrupt technique to configure PCI adapters. You can use this technique to install PCI adapters that currently do not support sharing of PCI interrupts.

- PCI slots 1 and 2 and the integrated SCSI controller are on PCI bus B; the system board and all other integrated devices are on PCI bus A.  
**Note:** PCI bus A is bus 0; PCI bus B is bus 1.
- The system scans PCI slots 1 and 2 to assign system resources. By default, the system starts (boots) devices in the following order: system SCSI devices, then PCI devices.  
**Note:** To change the boot precedence, start the Configuration/Setup Utility, select **Start Options** from the main menu; then, select the **PCI SCSI adapter boot option**.

## Installing an adapter in the model 8654

Complete the following steps to install an adapter:

**Attention:** When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, refer to “Handling static-sensitive devices” on page 50.

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the cover according to “Removing the cover” on page 56.
4. Remove the expansion-slot clip that holds the expansion-slot cover in place by sliding it upward and off the frame of the appliance server.
5. Remove the expansion-slot cover.
6. See the documentation that comes with your adapter for any cabling instructions.  
**Note:** Route internal adapter cables before you install the adapter.
7. Set any jumpers or switches as described by the adapter manufacturer.

8. Install the adapter:

**Note:** When installing an adapter into slot 2, skip steps a and d.

- a. Open the adapter-retention latch by pushing the blue tab to release it. Then push the latch up to the full open position.
- b. Carefully grasp the adapter by its top edge or upper corners, and align it with the connector on the PCI riser card.
- c. Press the adapter *firmly* into the riser-card connector.

**Attention:** When you install an adapter, be sure that the adapter is correctly seated in the riser-card connector before you turn on the appliance server. Improperly seated adapters might cause damage to the system board, the riser card, or the adapter.

- d. Push down on the blue adapter-retention latch until it clicks into place, securing the adapter.
- e. Replace the expansion-slot clip by sliding it down until it latches into place and holds the adapter securely.

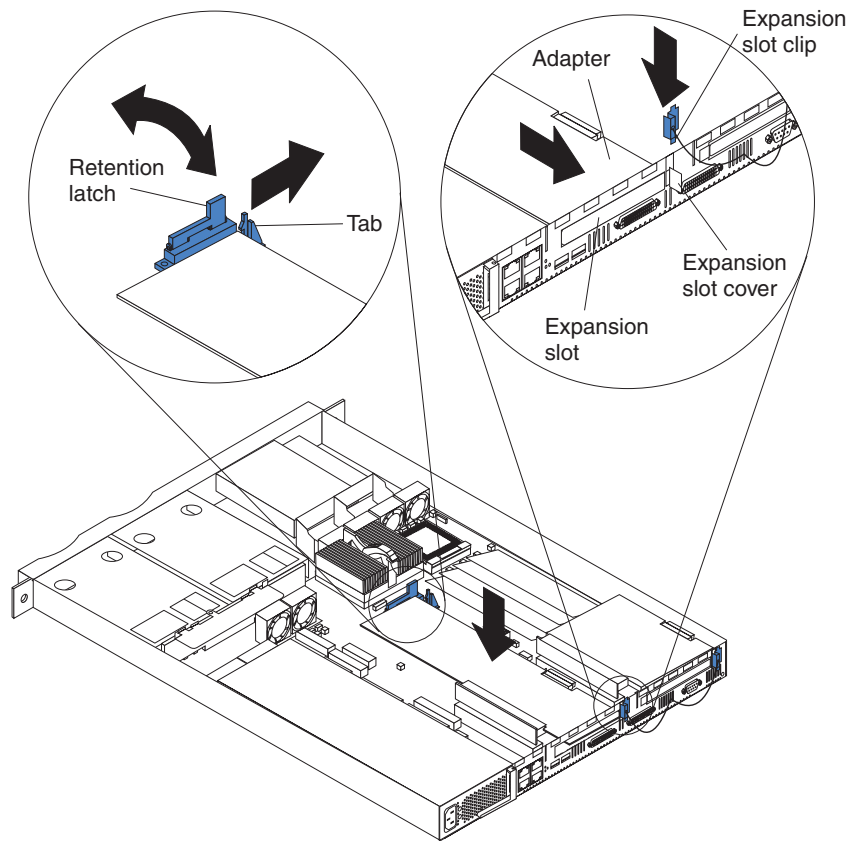


Figure 19. Installing the adapter

9. Connect the internal cables to the adapter, if necessary.

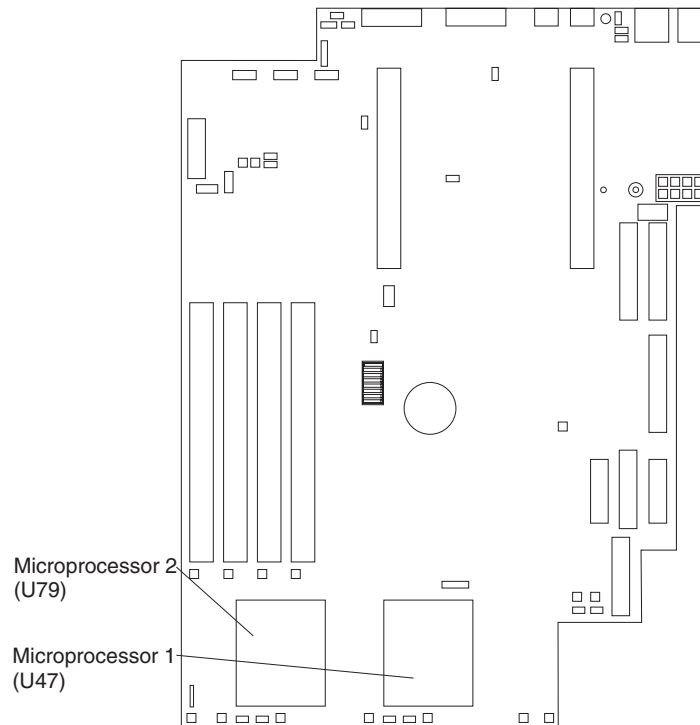
**Attention:** Route cables so that they do not block the flow of air from the fans.

10. If you have other options to install, install them now. Otherwise, go to “Installing the cover” on page 68.

---

## Installing a microprocessor on the model 8654

The model 8654 appliance server comes with one 1 GHZ microprocessor installed. The following illustration will help you locate the second microprocessor connector on the system board.



Servers with one microprocessor installed:

- Microprocessor is installed in microprocessor socket 1 (U47).
- Microprocessor supports both the startup and application processes.
- A terminator card is installed in microprocessor socket 2 (U79).

Servers with two microprocessors installed:

- One microprocessor is installed in microprocessor socket 1 (U47), and the second microprocessor is installed in socket 2 (U79).
- Both microprocessors share the system load.

Complete the following steps to install a second microprocessor:

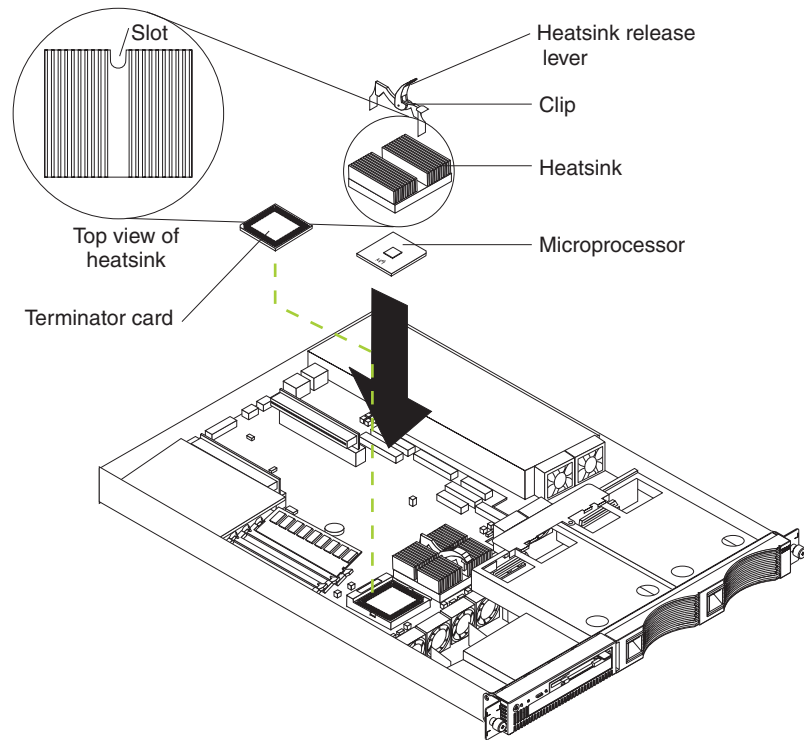
**Attention:** To avoid damage and to ensure proper server operation, review the following before you install a microprocessor:

- Ensure that the microprocessors are the same type, have the same cache size, and have the same clock speed.
- Ensure that the microprocessor internal and external clock frequencies are identical.
- See the ServerProven list at <http://www.ibm.com/pc/compat> for a list of microprocessors for use with your server.

**Attention:** When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details on handling these devices, see “Handling static-sensitive devices” on page 50.

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the cover according to “Removing the cover” on page 56.
4. Remove the plastic shield from the server.
5. Lift up the microprocessor release lever and remove the terminator card from the microprocessor connector.
6. Install the microprocessor in the microprocessor connector.
 

**Attention:** To avoid bending the pins, do not use excessive force.
7. Push the release lever down to lock the microprocessor into place.
8. Install the heat sink onto the microprocessor.



9. Replace the clear shield.
 

**Note:** The clear shield must be installed to maintain proper air flow and cooling inside the server.
10. If you have other options to install, install them now. Otherwise, go to “Installing the cover” on page 68.



---

## Replacing a fan assembly

The model 8654 appliance server comes with six replaceable fans. The model 8672 appliance server comes with four replaceable fans.

**Attention:** If a fan fails, replace it within 48 hours to help ensure proper cooling.

Complete the following steps to replace the fan assembly:

1. Review the information in “Safety” on page vii.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the cover according to “Removing the cover” on page 56.
4. Determine which fan to replace by checking the LED at each fan; a lit LED indicates the fan to replace.

**Note:** The fan LEDs are illuminated by the Light Path Diagnostics circuit (available on the xSeries 130 model 8654 only). For more information about the LEDs and the Light Path Diagnostics circuit, see “Model 8654 Light Path Diagnostics table” on page 105.

5. Remove the fan from the appliance server:
  - a. Disconnect the fan cable from the system board.
  - b. Lift the fan away from the appliance server.
6. Orient the fan so that the air flow arrow on the side of the fan is facing or pointing toward the rear of the appliance server.

**Note:** Proper air flow is from the front to the rear of the appliance server.

7. Push the replacement fan assembly into the appliance server until it clicks into place.

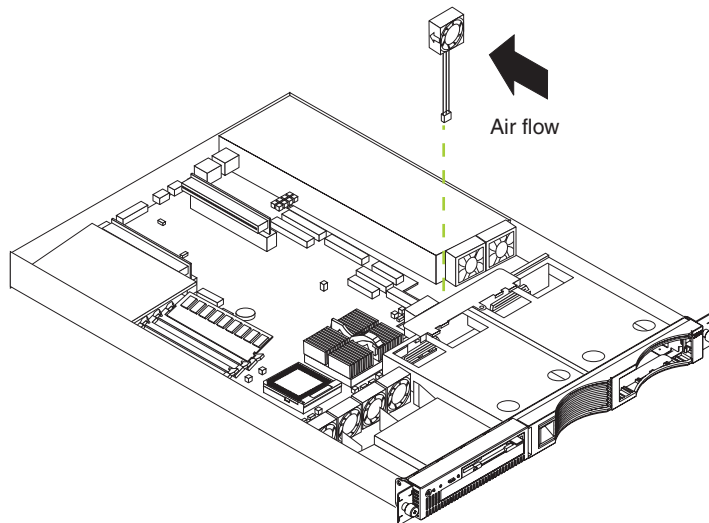


Figure 20. Replacing the fan

8. Connect the fan cable to the system board.

**Note:** When you start your appliance server after replacing a fan assembly, the system-error light will either remain on or turn off. If the system-error light remains on, you will have to turn off the appliance server to perform further troubleshooting.

9. If you have other options to install, install them now. Otherwise, go to “Installing the cover” on page 68.

---

## Installing the cover

Complete the following steps to install the appliance server cover:

1. Clear any cables that might impede the replacement of the clear shield or the cover.
2. Install the clear shield, if it was removed.

**Attention:** Before sliding the cover forward, make sure that all of the tabs on the cover will engage the ledge at the front of the appliance server properly. If all the tabs do not engage the ledge properly, it will be extremely difficult to remove the cover later.

3. Install the cover by placing it into position and sliding it forward. Make sure that the cover engages the tabs at the front and rear of the appliance server.
4. Install the screws, and secure the cover as shown.

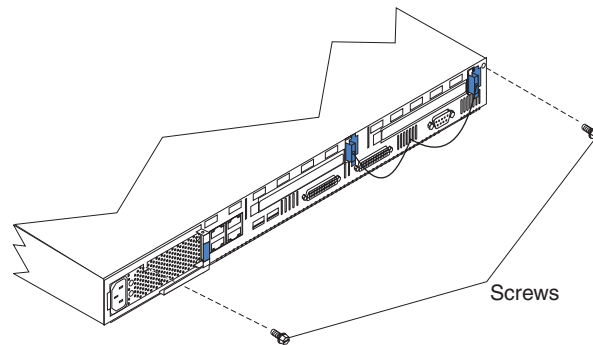


Figure 21. Installing the cover

5. If required for your configuration, install the appliance server in a rack cabinet.
6. Go to “Cabling the appliance server” for information on how to connect cables to your appliance server.

---

## Cabling the appliance server

This section contains the information you need to cable your appliance server. To cable the model:

- 8654, see “Cabling the model 8654 appliance server” on page 69.
- 8672, see “Cabling the model 8672 appliance server” on page 73.

## Cabling the model 8654 appliance server

Use the following illustration and the instructions in this section to attach the external cables to your server.

1. Connect the power cord and all external cables to the appliance server, and then plug the power cords into electrical outlets.

**Note:** Ethernet port 1 is for managing the appliance server. Ethernet port 2 is for hosting Internet content.

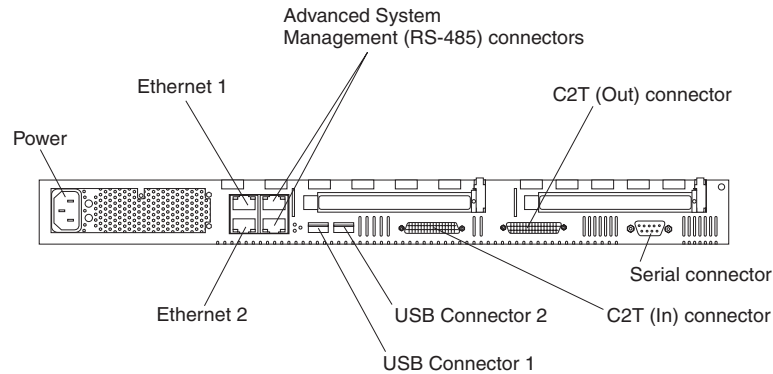


Figure 22. Identifying the xSeries 130 model 8654 connectors

To effectively manage the cables on your appliance server, keep groups of cables secured together, and do not run cables across the back of the appliance server.

### Notes:

- a. Use cable straps to bundle like cables together.
  - b. Use cable straps to secure the cable bundles to the vertical rails of the rack cabinet.
  - c. When possible, separate data and power cables. For more information on cable routing, see the cabling instructions for your xSeries 130 server on the World Wide Web at <http://www.pc.ibm.com/support>.
  - d. Do not secure cables too tightly. Overtightening can cause internal damage to cables.
2. Continue with “Cabling the RS-485 connectors”.

## Cabling the RS-485 connectors

You can use the RS-485 connectors to create an Advanced System Management (ASM) bus between several xSeries 130 appliance servers or other appliance servers.

**Note:** If you are not cabling your network for an ASM interconnect, go to “Connecting appliance servers with a C2T chain” on page 70.

Before you begin, review the following:

- The Advanced System Management bus is designed to connect up to 12 units or appliance servers. When using the IBM Remote Supervisor adapter, you can connect a maximum of 11 units or appliance servers together.
- You can hot-swap the cables in the Advanced System Management (ASM) bus.
- Use standard unshielded twisted pair (UTP) cables with RJ-45 connectors.

**Note:** For more information about the Advanced System Management PCI adapter, see the documentation that came with the adapter.

The appliance servers in the ASM bus are referred to by their assigned addresses and not their positions in the rack.

Complete the following steps to connect the ASM bus:

1. Locate the RS-485 connectors on the rear of the appliance servers and several UTP cables with RJ-45 connectors.
2. Starting at the top appliance server in the ASM bus, connect one end of the cable into the RS-485 (B) connector and the other end of the cable into the RS-485 (A) connector of the next appliance server.
3. Continue connecting the appliance servers together in this manner until you reach the second-to-last appliance server in the ASM bus.
4. Connect a cable from the RS-485 (B) connector of the second-to-last appliance server to the RS-485 (B) connector of the last appliance server. Refer to the following illustration to see how to connect the ASM bus.

**Note:** Be sure that the first and last connection of the ASM interconnect network are in Port B of the appliance servers.

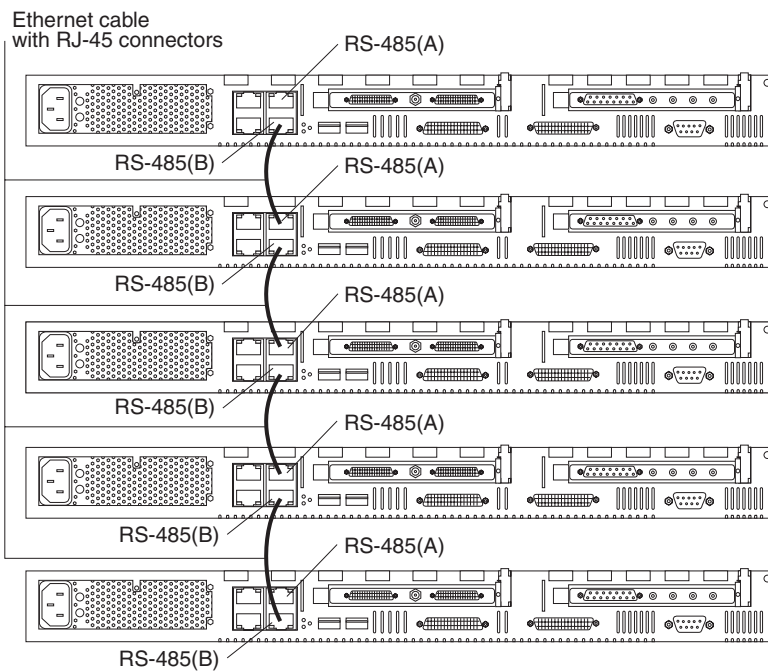


Figure 23. Viewing an ASM interconnect network

5. Continue with “Connecting appliance servers with a C2T chain”.

### Connecting appliance servers with a C2T chain

To share the same monitor, keyboard, and pointing device with several appliance servers, you must connect the appliance servers together with Cable Chain Technology (C2T) interconnect cables through the C2T (In) and C2T (Out) connectors.

The C2T chaining cable uses physically different shells and different-colored connector covers (a black cover for out and a white cover for in) to prevent the accidental connection of two C2T (Out) connectors.

Before you begin, review the following:

- You can connect a maximum of 42 appliance servers with the C2T chaining cables.

- When connecting appliance servers across a space larger than 3 U or on two separate racks, you must use a C2T interconnect cable that is 2 m (6.5 ft) long, which is available in the C2T option cable kit.  
**Note:** Only one 2-m (6.5 ft) cable can be used in the C2T chain.
- The C2T chaining cables are hot-swappable.  
**Attention:** Do not let the pins of the C2T cable connectors touch the appliance server chassis when adding or removing systems to or from the C2T chain.
- Servers are numbered by their position in the chain (1 through  $n$ ). If one appliance server is removed from the chain, all successive appliance servers are renumbered. For example, if the twelfth appliance server is removed from a chain of 15 appliance servers, appliance servers 13 through 15 will then be renumbered to 12 through 14.
- The C2T numbering is independent of any other appliance server reference. Changing the position of the appliance server in the C2T chain does not affect its IP addresses.

Complete the following steps to connect the appliance servers:

**Note:** If you are not connecting multiple servers, begin with step 1d.

1. Using the C2T cables, connect the appliance servers together:

**Note:** Your appliance server comes with a short C2T chaining cable that can span approximately 3 U if needed. A longer C2T cable is available in the C2T cable option kit.

- a. Connect one end of the C2T chaining cable to the C2T (Out) port of the top appliance server.
- b. Connect the opposite end of the C2T chaining cable to the C2T (In) port of the appliance server below it.
- c. Repeat these steps until all of the appliance servers are connected together.
- d. Connect the C2T breakout cable to the C2T (Out) port of appliance server 1.

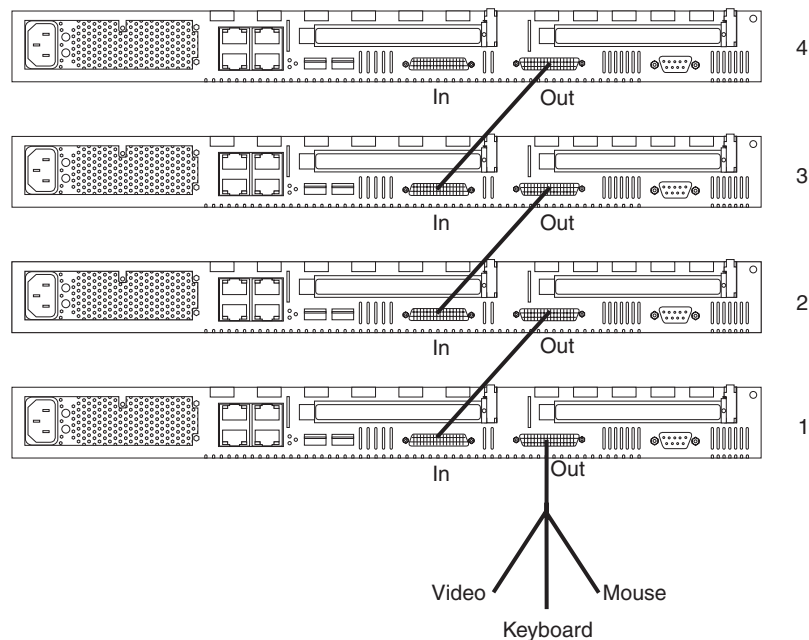


Figure 24. Viewing a C2T interconnect

**Note:** Server 1 (usually the appliance server at the bottom of the rack) is the appliance server to which you connect the device breakout cable.

2. Connect a keyboard, monitor, and mouse to the C2T breakout cable.
3. Check the operation of the monitor, pointing device, and keyboard with each appliance server. For testing instructions, see “Testing the C2T chain”.

### Testing the C2T chain

After connecting the C2T chain, you will need to test the monitor, keyboard, and pointing device to be sure that they work with each of the appliance servers.

Follow these steps to test the C2T cabling:

1. Turn on the appliance servers and the monitor.
2. Verify that the light in the Select button on appliance server 1 in the C2T chain is lit, indicating that it is selected. If it is not, press the Select button.
3. Verify that the monitor is working.
4. Start up an operating system that has a mouse or pointing device driver and verify that the mouse or pointing device buttons function.
5. Test your keyboard by typing a few words within an application.
6. Press NumLock on the keyboard twice, and then press the number of the appliance server to test next, and then press Enter. Repeat steps 1 through 4 for each of the appliance servers in the chain.
7. If necessary, review “Using the C2T feature”.

**Note:** If you cannot use the devices, check your cable connections and retry the test. If the problem persists, turn off the appliance servers and connect the C2T breakout cable directly to the C2T (Out) port of the appliance server. Power-on the appliance server and retry the devices. If the devices work, you probably have a bad C2T interconnect cable. Replace the cable and retry the devices in the C2T chain configuration.

Refer to “Input/output connector locations and ports” on page 74 for more details about the input/output connectors on your appliance server.

### Using the C2T feature

Placing several appliance servers in a C2T chain enables you to share the same monitor, keyboard, and mouse on all appliance servers in the chain. To select an appliance server, you can either use the Console Select button on the front of the appliance server that you want to select, or you can use the keyboard. If you turn off a selected appliance server, you must select another appliance server that is powered up. For the location of the Select button, see “The IBM xSeries 130 model 8654 appliance server” on page 5.

To use the keyboard, do the following:

1. Press NumLock on the keyboard twice. The screen goes blank.
2. Type the number that corresponds to the appliance server ID in the C2T chain. The screen returns for the appliance server that you selected, and the Console Select LED for that appliance server illuminates.

Server 1 (usually the appliance server at the bottom of the rack) is the appliance server to which you connect the C2T breakout cable. Server 1 must not be turned off (powered down) for the chain to work properly. If appliance server 1 is turned off (powered down), it must be removed from the chain and replaced by the next appliance server in the chain.

Servers are numbered by their position in the chain (1 through  $n$ ). If one appliance server is removed from the chain, all successive appliance servers are renumbered. For example, if the twelfth appliance server is removed from a chain of 15 appliance servers, appliance servers 13 through 15 will then be renumbered to 12 through 14.

When removing or replacing appliance servers, or changing cables in the chain, it is possible for more than one Select LED to be illuminated on the appliance servers in the chain. To clear all but the selected appliance server LED, press the Select button on any one of the appliance servers in the chain.

If you are using a flat-panel monitor, you might need to adjust the image lock on your monitor when multiple appliance servers are connected using C2T interconnect cables. To adjust this image, select one of the middle appliance servers in the chain by pressing the Select button on the front of the appliance server; then, adjust the image lock accordingly. For more information on how to adjust the image lock, see the documentation that comes with your flat-panel monitor.

**Note:** For the chain to operate properly, no more than two adjacent appliance servers can be unplugged from the electrical outlet at the same time.

## Cabling the model 8672 appliance server

Use the following illustration to cable the model 8672 appliance server.

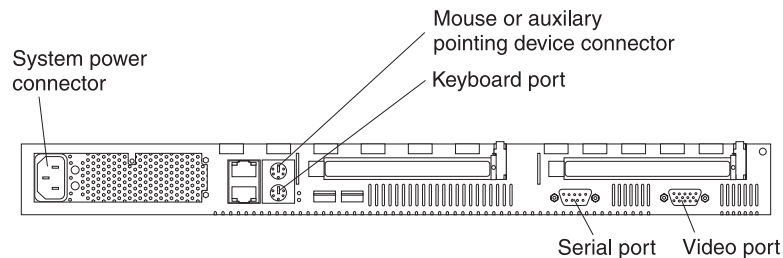


Figure 25. Locating the connectors

To effectively manage the cables on your appliance server, keep groups of cables secured together, and do not run cables across the back of the appliance server.

### Notes:

1. Use cable straps to bundle like cables together.
2. Use cable straps to secure the cable bundles to the vertical rails of the rack cabinet.
3. When possible, separate data and power cables. For more information on cable routing, see the cabling instructions for your xSeries 130 server on the World Wide Web at <http://www.pc.ibm.com/support>.
4. Do not secure cables too tightly. Overtightening can cause internal damage to your cables.

Refer to “Input/output connector locations and ports” on page 74 for more details about the input/output connectors on your appliance server.

## Input/output connector locations and ports

The following illustrations show the input/output connectors and the expansion slots on the rear of the appliance server. Your appliance server has the following input/output (I/O) connectors:

- Serial connector
- Universal Serial Bus (USB) connectors
- Ethernet connectors
- Cable Chaining Technology (C2T) connectors (model 8654 only)
- Advanced System Management (ASM) connectors (model 8654 only)
- Keyboard connector (model 8672 only)
- Video connector (model 8672 only)
- Auxiliary-device (pointing device) connector (model 8672 only)

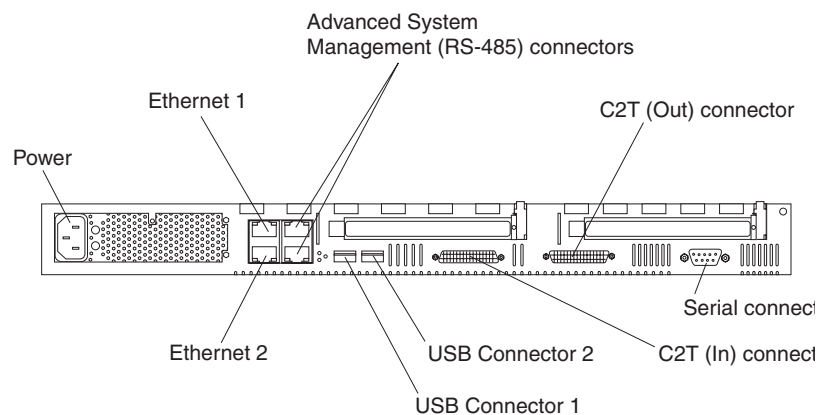


Figure 26. Identifying the connectors on the model 8654

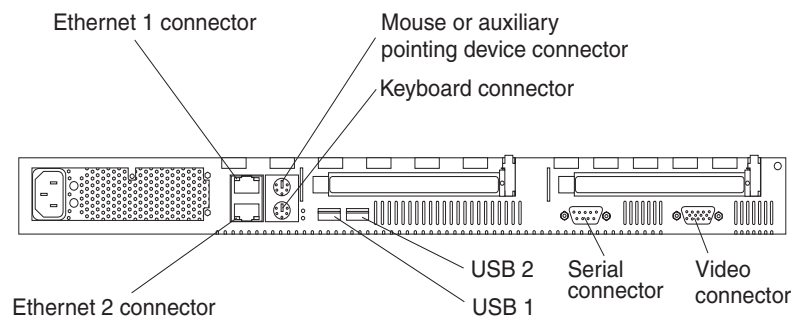


Figure 27. Identifying the connectors on the model 8672

## Serial port

Your appliance server has one standard serial port. Some application programs require specific ports, and some modems function properly only at certain serial port addresses. Use the Configuration/Setup Utility program to change the port address assignments and prevent conflicts.



Table 6. Serial port connector on the system board.

Connector	Port	Description
COM1	Serial port connector(external)	Default connection. Used by the operating system. The modem can be connected so that the system can dial out during problems.

## Viewing or changing the serial-port assignments

To view or change the serial-port assignments:

1. Restart the appliance server and watch the monitor screen.
2. When the message Press F1 for Configuration/Setup appears, press F1.
3. From the main menu, select **Devices and I/O Ports**; then, press Enter.

**Note:** The Devices and I/O Ports choice appears only on the full configuration menu. If you set two levels of passwords, you must enter the administrator password to access the full configuration menu.

4. Select the serial port; then, use the arrow keys to advance through the settings available.
5. Select **Save Settings**; then, select **Exit Setup** to exit from the Configuration/Setup Utility main menu.

## Serial-port connector

Your appliance server has one serial-port connector located on the rear of the appliance server.

The following table and illustration shows the pin-number assignments for the 9-pin, male D-shell serial-port connector on the rear of your appliance server. These pin-number assignments conform to the industry standard.

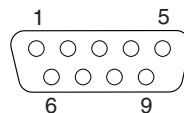


Table 7. Serial-port connector pin-number assignments.

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Signal ground		

## Universal Serial Bus ports

Your appliance server has two Universal Serial Bus (USB) ports, which configure automatically. USB is an emerging serial interface standard for telephony and multimedia devices. It uses Plug and Play technology to determine the type of device attached to the connector.

## USB cables and hubs

You need a 4-pin cable to connect devices to USB 1 or USB 2. If you plan to attach more than two USB devices, you must use a hub to connect the devices. The hub provides multiple connectors for attaching additional external USB devices.

USB technology provides up to 12 megabits-per-second (Mbps) speed with a maximum of 127 external devices and a maximum signal distance of five meters (16 ft). per segment.

## USB-port connectors

Each USB port has an external connector on the rear of the appliance server for attaching USB-compatible devices.

The following table and illustration show the pin-number assignments for the USB-port connectors on the rear of your appliance server.

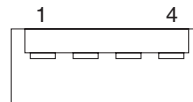


Table 8. USB-port connector pin-number assignments.

Pin	Signal
1	VCC
2	-Data
3	+Data
4	Ground

## Ethernet ports

Your appliance server comes with two integrated Ethernet controllers. These controllers provide an interface for connecting to 10-Mbps or 100-Mbps networks and provide full-duplex (FDX) capability, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN).

To access the Ethernet ports, connect a Category 3, 4, or 5 unshielded twisted-pair (UTP) cable to the RJ-45 connector on the rear of your appliance server.

**Note:** The 100BASE-TX Fast Ethernet standard requires that the cabling in the network be Category 5 or higher.

## Ethernet port connector

The following table shows the pin-number assignments for the RJ-45 connector. These assignments apply to both 10BASE-T and 100BASE-TX devices.

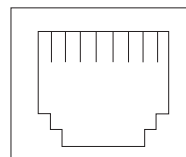


Table 9. Ethernet RJ-45 connector pin-number assignments..

Pin	Signal	Pin	Signal
1	Transmit data+	5	Not connected
2	Transmit data-	6	Receive data -
3	Receive data+	7	Not connected
4	Not connected	8	Not connected

## Configuring the Ethernet controllers

When you connect your appliance server to the network, the Ethernet controllers automatically detect the data-transfer rate (10Mbps or 100Mbps) on the network and then set the controllers to operate at the appropriate rate. In addition, if the Ethernet ports that your appliance server is connected to support auto-negotiation, the Ethernet controllers will set the appropriate duplex state. That is, the Ethernet controllers will adjust to the network data rate, whether the data rate is standard Ethernet (10BASE-T), Fast Ethernet (100BASE-TX), half duplex (HDX), or full duplex (FDX). The controllers support half-duplex (HDX) and full-duplex (FDX) modes at both speeds.

## High-Performance Ethernet Modes

Your Ethernet controllers support optional modes, such as teaming, priority packets, and virtual LANs, which provide higher performance and throughput for your appliance server.

**Teaming Mode:** Your Ethernet controllers provide options, called *teaming options*. These options increase throughput and fault tolerance.

- **Adapter fault tolerance (AFT)** provides automatic redundancy for your adapter. If the primary adapter fails, the secondary adapter takes over. Adapter fault tolerance supports from two to four adapters per team.
- **Adaptive load balancing (ALB)** enables you to balance the transmission data flow among two to four adapters. ALB also includes the AFT option. You can use ALB with any 100BASE-TX switch.
- **Cisco Fast EtherChannel (FEC)** creates a team of two to four adapters to increase transmission and reception throughput. FEC also includes the AFT option. You can use FEC only with a switch that has FEC capability.

Teaming requires you to install both integrated Ethernet controllers. For additional information about the teaming modes, see the documentation that comes with these additional adapters.

**Priority Packet mode:** Priority Packet is a traffic-prioritization utility that enables you to set up filters to process high-priority traffic before normal traffic. You can send information from critical nodes or applications with an indicated priority. Because you set this priority at the host or entry point of the network, the network devices can base forwarding decisions on priority information defined in the packet.

Priority Packet information is available on the IBM Networking Web site at <http://www.ibm.com/networking/support> on the World Wide Web.

Priority Packet prioritizes traffic based on priority filters. These are parameters you assign to outgoing (transmit) packets. Using the Priority Filter wizard, you can set up predefined or custom priority filters based on a node (MAC) address, Ethernet type, or by various properties of the protocol and port. Priority Packet provides two different methods for prioritizing traffic: IEEE 802.1p tagging and High Priority Queue.

IEEE 802.1p is an IEEE standard for tagging, or adding additional bytes of information to packets with different priority levels. Packets are tagged with 4 additional bytes, which increase the packet size and indicate a priority level. When you send these packets out on the network, the higher priority packets are transferred first. Priority packet tagging (also known as Traffic Class Expediting) enables the adapter to work with other elements of the network (such as switches and routers) to deliver priority packets first. You can assign specific priority levels from 0 (low) to 7 (high).

You can assign values to packets based on their priority when you use the IEEE 802.1p standard for packet tagging. This method requires a network infrastructure that supports packet tagging. The routing devices receiving and transferring these packets on your network must support 802.1p for tagging to be effective.

After you set up the priority filter in Priority Packet, you must launch IBMSet and select **802.1p/802.1Q Tagging** on the Advanced page.

**Note:** IEEE 802.1p tagging increases the size of the packets it tags. Some hubs and switches will not recognize the larger packets and will drop them. Check your hub or switch documentation to see if they support 802.1p. (You can configure the switch to strip the tags from the packets and send it on to the next destination as normal traffic). If these devices do not support 802.1p or if you are not sure, use High Priority Queue (HPQ) to prioritize network traffic.

The requirements for effectively using IEEE 802.1p tagging are:

- The other devices receiving and routing 802.1p tagged packets must support 802.1p.
- The adapters on these devices must support 802.1p. The Ethernet controller in your appliance server, all IBM Netfinity 10/100 Ethernet Security Adapters, and IBM 10/100 Ethernet Server Adapters support 802.1p.
- The adapter cannot be assigned to an adapter team.
- If you are setting up VLANs and packet tagging on the same adapter, 802.1p/802.1Q Tagging must be enabled on the IBMSet Advanced page.

If your network infrastructure devices do not support IEEE 802.1p or you are not sure, you can still define filters and send packets as high priority. While High Priority Queue (HPQ) does not provide the precise priority levels of 802.1p tagging, it does assign traffic as either high or low priority and sends high priority packets first. Therefore, if there are multiple applications on a system sending packets, the packets from the application with a filter are sent out first. HPQ does not change network routing, nor does it add any information to the packets.

To assign HPQ, you can specify it using Priority Packet when you create or assign a filter.

To effectively use HPQ, the adapter cannot be assigned to an adapter team.

**Virtual LAN mode:** A virtual LAN (VLAN) is a logical grouping of network devices put together as a LAN, regardless of their physical grouping or collision domains. Using VLANs increases network performance and improves network security.

VLANs offer you the ability to group users and devices together into logical workgroups. This can simplify network administration when connecting clients to appliance servers that are geographically dispersed across the building, campus, or enterprise network.

Typically, VLANs are configured at the switch, and any computer can be a member of one VLAN per installed network adapter. Your Ethernet controller supersedes this by communicating directly with the switch, enabling multiple VLANs on a single network adapter (up to 64 VLANs).

To set up VLAN membership, your Ethernet controller must be attached to a switch that has VLAN capability.

To join a VLAN from Microsoft Windows 2000:

1. Create a VLAN on the switch. Use the parameters you assign there to join the VLAN from the appliance server. See your switch documentation for more information.
2. Double-click the **Network** icon in the Control Panel window.
3. On the Adapter page, select the adapter you want to be on the VLAN, and click **Properties**.
4. In IBMSet, select **Join VLAN**. Note that VLANs cannot be assigned to adapters that are already defined to have an adapter teaming option.
5. Type the VLAN ID and VLAN name. The VLAN ID must match the VLAN ID of the switch. The ID range is from 1 to 1000. The VLAN name is for information only and does not need to match the name on the switch.
6. Click **Join VLAN**. Repeat steps 3 through 5 for each VLAN you want the appliance server to join. The VLANs you add are listed on the Adapters page.
7. Click **Close**, and restart the computer.

## C2T ports on the model 8654

There are two Cable Chain Technology (C2T) connectors on the rear of your model 8654 appliance server labeled "IN" and "OUT." These connectors operate with the C2T ports to create a communications chain between appliance servers and a console (monitor, mouse, and keyboard). To share the same monitor, keyboard, and pointing device with several appliance servers, you must connect the appliance servers together with C2T interconnect cables through the C2T (In) and C2T (Out) connectors.

**Note:** The highest video mode supported in the C2T chain is 1024 x 768.

### C2T breakout cable

A keyboard, monitor, and mouse or pointing device are connected to your model 8654 appliance server through the C2T breakout cable. The keyboard and mouse cables have icons of a keyboard and a mouse on their respective cable connectors for easy identification.

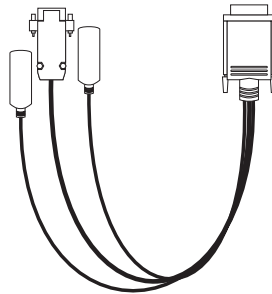


Figure 28. Using the C2T cable

## Advanced System Management ports on the model 8654

There are two kinds of Advanced System Management ports on the model 8654 appliance server: the Management port (Serial port A) and RS-485 ports.

### Management port (Serial port A)

This port uses a standard D-shell serial-port connector, labeled A on the rear of the appliance server. You can attach a dedicated modem to the D-shell connector on the rear of your appliance server to communicate with the integrated Advanced System Management processor. For more information about the serial port, see “Serial port” on page 74.

### RS-485 ports

The RS-485 ports on the rear of your appliance server enable you to connect the Advanced System Management processors of several rack-mounted appliance servers so that they can communicate with each other in half-duplex mode.

## Keyboard connector on the model 8672

There is one keyboard connector on the rear of the model 8672 appliance server.

**Note:** If you attach a standard keyboard to the keyboard connector, the USB ports, and devices will be disabled during the power-on self-test (POST).

The following table and illustration shows the pin-number assignments for the keyboard connector on the end of the cable.

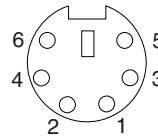


Table 10. Keyboard-connector (6-pin female) pin-number assignments .

Pin	I/O	Signal
1	I/O	Data
2	N/A	Reserved
3	N/A	Ground
4	N/A	+5 V dc
5	I/O	Keyboard clock
6	N/A	Reserved

## Video connector on the model 8672

The following table shows the pin-number assignments for the 15-pin analog video connector on the rear of the model 8672 appliance server.

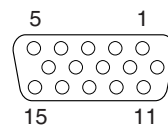


Table 11. Video-connector (15-pin female) pin-number assignments.

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	6	Ground	11	Not connected
2	Green or monochrome	7	Ground	12	DDC SDA
3	Blue	8	Ground	13	Horizontal synchronization (Hsync)
4	Not connected	9	+5 V dc DDC	14	Vertical synchronization (Vsync)
5	Ground	10	Ground	15	DDC SCL

## Auxiliary-device (pointing device) connector on the model 8672

There is one auxiliary-device connector that supports a mouse or other pointing device located on the rear of the model 8672 appliance server just under the keyboard connector. The following table shows the pin-number assignments for the auxiliary-device connector on the end of the cable.

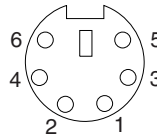


Table 12. Auxiliary or pointing-device-connector (6-pin female) pin-number assignments .

Pin	Signal
1	Data
2	Not connected
3	Ground
4	+5 V dc
5	Clock
6	Not connected





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## Chapter 7. Solving problems

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your appliance server. You might need to connect a monitor, mouse, and keyboard to aid in your troubleshooting.

If you cannot locate and correct the problem using the information in this section, see “Using the Recovery CD” on page 112 for information on how to use the *Recovery CD* that comes with your appliance server to restore the original preinstalled software. The “Getting information, help, and service” on page 114 has information on how to obtain help from IBM for your appliance server.

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### Diagnostic tools overview

The following tools are available to help you identify and resolve hardware-related problems:

- **POST beep codes, error messages, and error logs**

The power-on self-test (POST) generates beep codes and messages to indicate successful test completion or the detection of a problem. See “POST” on page 85 for more information.

- **Diagnostic programs and error messages**

The appliance server diagnostic programs are stored in upgradable read-only memory (ROM) on the system board for the model 8654 or provided on the *IBM Enhanced Diagnostics CD* for the model 8672. These programs are the primary method of testing the major components of your appliance server. See “Diagnostic programs and error messages” on page 95 for more information.

- **Light Path Diagnostics**

The Light Path Diagnostics feature is for identifying system errors on the xSeries 130 model 8654.

- **Troubleshooting charts**

These charts list problem symptoms, along with suggested steps to correct the problems. See the “Troubleshooting charts” on page 107 for more information.

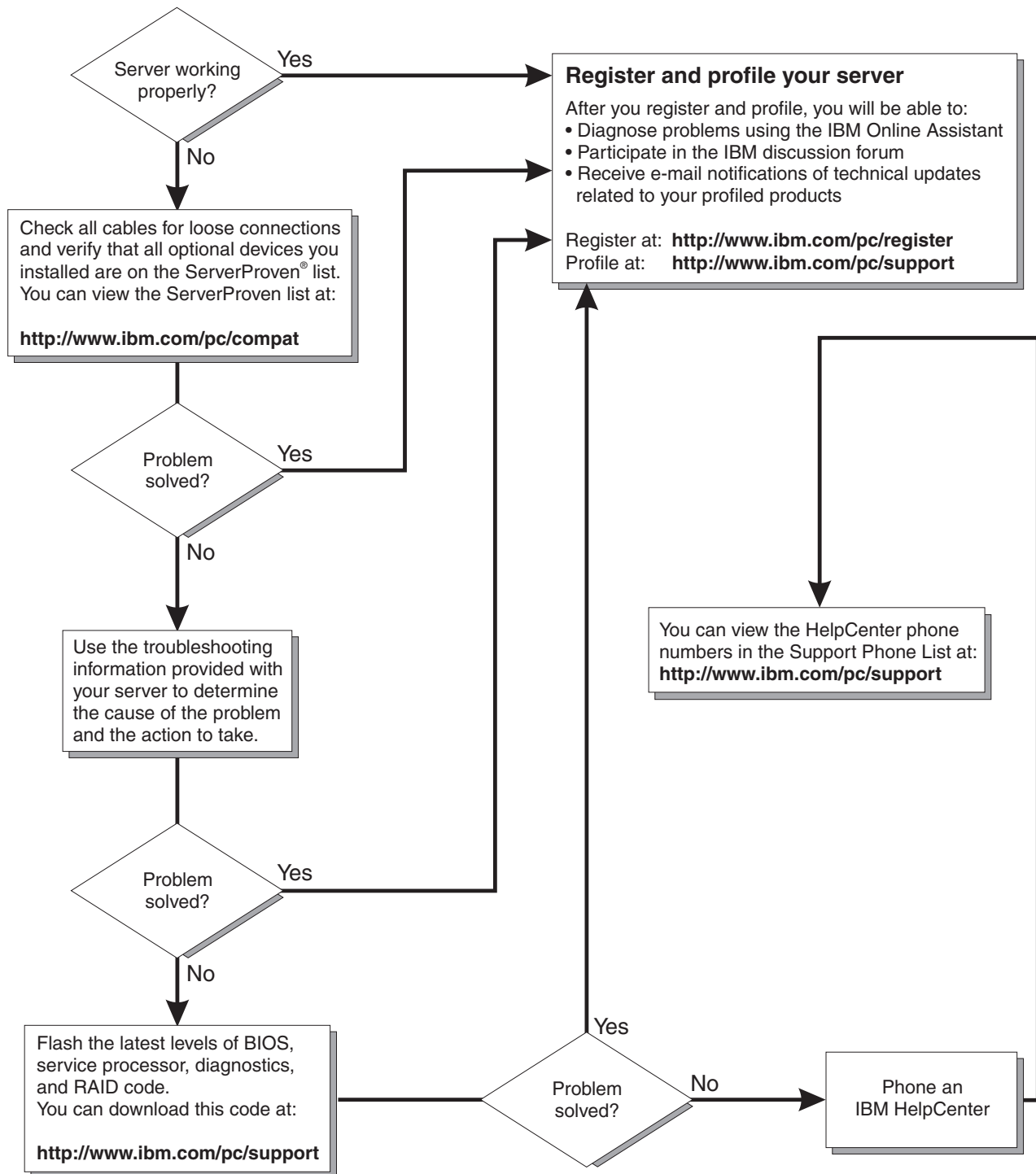
- **Customized support page**

You can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, parts information, technical hints and tips, and downloadable files. In addition, you can choose to receive electronic mail (e-mail) notifications whenever new information becomes available about your registered products.

After you register and create a profile for your xSeries products, you can diagnose problems using the IBM Online Assistant, and you can participate in the IBM discussion forum. For more detailed information about registering and creating a customized profile for your IBM products, visit the following addresses on the Web:

- <http://www.ibm.com/pc/register>
- <http://www.ibm.com/pc/support>

# Server Support



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## POST

When you turn on the appliance server, it performs a series of tests to check the operation of appliance server components and some of the options that are installed in the appliance server. This series of tests is called the power-on self-test, or POST.

If POST finishes without detecting any problems, a single beep sounds, and the first screen of your operating system or application program appears.

If POST detects a problem, more than one beep sounds, and an error message appears on your screen. See “POST beep code descriptions” and “POST error messages” on page 88 for more information.

### Notes:

1. If you have a power-on password set, you must type the password and press Enter, when prompted, before POST will continue.
2. A single problem might cause several error messages. When this occurs, work to correct the cause of the first error message. After you correct the cause of the first error message, the other error messages usually will not occur the next time you run the test.

## POST beep code descriptions

Beep codes are sounded in a series of long and short beeps. The possible types of beep codes that your appliance server might emit include the following:

### No beeps

If no beep occurs after your appliance server completes POST, call for service.

### Continuous beep

Your startup (boot) microprocessor has failed, or your system board or speaker subsystem might contain a failing component. If the system continues through POST with no errors, call for service. If no video appears, the startup processor has failed; replace the startup processor.

### One short beep

One beep indicates that your appliance server successfully completed POST. POST detected no configuration or functional errors. One beep also occurs after your appliance server completes POST if you type an incorrect power-on password.

### Two short beeps

POST encountered an error. The Configuration/Setup Utility program will display additional information; follow the instructions that appear on the screen. See “POST error messages” on page 88 for descriptions of the text messages that might appear.

### Three short beeps

A system memory error has occurred. This combination occurs only if the video basic input/output system (BIOS) cannot display the error message. Replace the failing memory module.

### **Repeating short beeps**

The system board might contain a failing component, your keyboard might be defective, or a key on the keyboard might be stuck. Running the diagnostic tests can isolate the appliance server component that failed, but you must have your system serviced. If the error message remains, call for service. Ensure that:

- Nothing is resting on the keyboard and pressing the key.
- No key is struck.
- The keyboard cable is connected correctly to the keyboard and to the correct connector on the serve.

**Note:** If you just connected a new mouse or other pointing device, turn off the appliance server and disconnect that device. Wait at least 5 seconds; then, turn on the appliance server. If the error message goes away, replace the device.

Running the diagnostic tests can isolate the appliance server component that failed, but you must have your system serviced. If the error message remains, call for service.

### **One long and one short beep**

POST encountered an error on a video adapter. If you are using the integrated video controller, call for service. If you are using an optional video adapter, replace the failing video adapter.

### **One long and two short beeps**

A video I/O adapter ROM is not readable, or the video subsystem is defective. If you hear this beep combination twice, both the system board and an optional video adapter have failed the test. This beep combination might also indicate that the system board contains a failing component.

### **One long and three short beeps**

The system-board video subsystem has not detected a monitor connection to the appliance server. Ensure that the monitor is connected to the appliance server. If the problem persists, replace the monitor.

### **Two long and two short beeps**

POST does not support the optional video adapter. This beep combination occurs when you install a video adapter that is incompatible with your appliance server. Replace the optional video adapter with one that the appliance server supports, or use the integrated video controller.

## **POST beep codes**

This section contains the POST beep codes for your appliance server. Your server might omit beep codes that are described in the following table. For example, a 1-2-3 beep code is one beep, a pause, two consecutive beeps, another pause, and then three more consecutive beeps.

Table 13. POST beep codes.

Beep code	Description	Action
1-1-2	Microprocessor register test has failed.	Call for service.
1-1-3	CMOS write/read test has failed.	
1-1-4	BIOS ROM checksum has failed.	
1-2-1	Programmable Interval Timer test has failed.	
1-2-2	DMA initialization has failed.	
1-2-3	DMA page register write/read test has failed.	
1-2-4	RAM refresh verification has failed. Turn off the appliance server and then restart the appliance server. If the problem persists, call for service.	
1-3-1	First 64 KB RAM test has failed. Turn off the appliance server and then restart the appliance server. If the problem persists, call for service.	
1-3-2	First 64 KB RAM parity test has failed. Turn off the appliance server and then restart the appliance server. If the problem persists, call for service.	
1-4-3	Interrupt vector loading test has failed.	
2-1-1	Secondary DMA register test has failed.	
2-1-2	Primary DMA register test has failed.	
2-1-3	Primary interrupt mask register test has failed.	
2-1-4	Secondary interrupt mask register test has failed.	
2-2-1	Interrupt vector loading has failed.	
2-2-2	Keyboard controller test has failed.	
2-2-3	CMOS power failure and checksum checks have failed.	
2-2-4	CMOS configuration information validation has failed.	
2-3-2	Screen memory test has failed.	
2-3-3	Screen retrace tests have failed.	
2-3-4	Search for video ROM has failed.	
2-4-1	Screen test indicates the screen is operable.	
3-1-1	Timer tick interrupt test has failed.	
3-1-2	Interval timer channel 2 test has failed.	
3-1-3	RAM test has failed above address hex 0FFFF.	
3-1-4	Time-of-Day clock test has failed.	
3-2-1	Serial port test has failed.	
3-2-2	Parallel port test has failed.	
3-2-4	Comparison of CMOS memory size against actual has failed.	
3-3-1	A memory size mismatch has occurred. Turn off the appliance server and then restart the appliance server. If the problem persists, call for service.	
3-3-2	I2C bus has failed.	

## POST error messages

The following tables provide information about the POST error messages that can appear during startup. You need to attach a mouse, monitor, and keyboard to view the post error messages.

Table 14. POST error messages.

POST message	Description
062	<p>The appliance server failed to start on three consecutive attempts.</p> <p>All caches are disabled. Repeatedly turning the appliance server on and then off or resetting the appliance server might cause this problem.</p> <p><b>Action:</b> Start the Configuration/Setup Utility program and verify that all settings are correct. Use the <b>Cache Control</b> selection in the Advanced Setup menu of the Configuration/Setup Utility program to enable the caches.</p> <p>If the problem persists, call for service. When the problem is corrected, be sure to enable the caches.</p>
101 102 106	<p>An error occurred during the system board and microprocessor test.</p> <p><b>Action:</b> Call for service.</p>
114	<p>An adapter read-only memory (ROM) error occurred.</p> <p><b>Action:</b> Remove the options. If you can start the appliance server without the options installed, reinstall each option one at a time and retest after each is reinstalled. When an option fails, replace it.</p> <p>If you cannot isolate and correct the problem, call for service.</p>
129	<p>An error was detected in the L1 cache of one of the microprocessors.</p> <p><b>Action:</b></p> <ol style="list-style-type: none"> <li>1. If you just installed a microprocessor, verify that the microprocessor is installed and seated correctly.</li> <li>2. If the problem persists, call for service.</li> </ol>
151	<p>A real-time clock (RTC) error occurred.</p> <p><b>Action:</b> Call for service.</p>
161	<p>The real-time clock battery has failed.</p> <p><b>Action:</b> Replace the battery yourself or call for service.</p> <p>You can use the appliance server until you replace the battery. However, you must run the Configuration/Setup Utility program and set the time and date and other custom settings each time you turn on the appliance server.</p>
162	<p>A change in device configuration occurred. This error occurs under one or more of the following conditions:</p> <ul style="list-style-type: none"> <li>• A new device has been installed.</li> <li>• A device has been moved to a different location or cable connection.</li> <li>• A device has been removed or disconnected from a cable.</li> <li>• A device is failing and is no longer recognized by the appliance server as being installed.</li> <li>• An external device is not turned on.</li> <li>• An invalid checksum is detected in the battery-backed memory.</li> </ul> <p><b>Action:</b> Verify that all external devices are turned on. You must turn on external devices before turning on the appliance server.</p> <p>If you did not add, remove, or change the location of a device, a device is probably failing. Running the diagnostic program might isolate the failing device.</p> <p>If you cannot isolate and correct the problem, call for service.</p>

Table 14. POST error messages.

POST message	Description
163	<p>The time of day has not been set.</p> <p><b>Action:</b> Set the correct date and time. If the date and time are set correctly and saved, but the 163 error message reappears, call for service.</p> <p>You can use the appliance server until the system is serviced, but any application programs that use the date and time will be affected.</p>
164	<p>A change in the memory configuration occurred. This message might appear after you add or remove memory.</p> <p><b>Note:</b> The appliance server can be used with decreased memory capacity.</p> <p><b>Action:</b></p> <ol style="list-style-type: none"> <li>1. If POST error message 289 also occurred, follow the instructions for that error message first.</li> <li>2. If you just installed or removed memory, run the Configuration/Setup Utility program; then, exit, saving the new configuration settings.</li> </ol> <p>If the message appears again, shut down the appliance server, reset the memory modules, and restart the appliance server.</p> <p>If the problem persists, call for service.</p>
175	<p>A vital product data (VPD) error occurred.</p> <p><b>Action:</b> Call for service.</p>
176 177 178	<p>A security hardware error occurred.</p> <p><b>Action:</b> Check for indications that someone has tampered with the appliance server. If no one has tampered with the appliance server, call for service.</p>
184	<p>The power-on password information stored in your appliance server has been removed.</p> <p><b>Action:</b> From the Configuration/Setup Utility program main menu, select <b>System Security</b>. Then, follow the instructions on the screen.</p> <p>If this information cannot be restored, call for service.</p>
185	<p>A power failure damaged the stored information about the drive-startup sequence.</p> <p><b>Action:</b> From the Configuration/Setup Utility program main menu, select <b>Start Options</b>; then, follow the instructions on the screen.</p> <p>If this information cannot be restored, call for service.</p>
186	<p>A system board or hardware error occurred.</p> <p><b>Action:</b> Call for service.</p>
187	<p>The VPD serial number is not set.</p> <p><b>Action:</b> The system serial number is set in the VPD EEPROM at the time of manufacturing. If the system board has been replaced, the system serial number will be invalid and should be set. From the main menu of the Configuration/Setup Utility program, select <b>System Information</b>, and then select <b>Product Data</b>. If the problem persists, call for service.</p>
188	<p>A vital product data (VPD) error occurred.</p> <p><b>Action:</b> Call for service.</p>
189	<p>An attempt has been made to access the appliance server with invalid passwords. After three incorrect attempts, the appliance server locks up; that is, the logon data fields are no longer available to the user.</p>

Table 14. POST error messages.

POST message	Description
201	<p>An error occurred during the memory controller test. This error can be caused by:</p> <ul style="list-style-type: none"> <li>• Incorrectly installed memory</li> <li>• A failing memory module</li> <li>• A system board problem</li> </ul> <p><b>Action:</b> 1. If you just installed memory, verify that the new memory is correct for your appliance server. Also verify that the memory is installed and seated correctly.</p> <p>2. If the problem persists, call for service.</p>
229	<p>An error was detected in the L2 cache of one of the microprocessors.</p> <p><b>Action:</b> 1. If you just installed a microprocessor, verify that the microprocessor is installed and seated correctly.</p> <p>2. If the problem persists, call for service.</p>
289	<p>An error occurred during POST memory tests, and a failing DIMM was disabled.</p> <p><b>Note:</b> You can use the appliance server with decreased memory.</p> <p><b>Action:</b> 1. If you just installed memory, verify that the new memory is correct for your appliance server. Also verify that the memory is installed and seated correctly. Start the Configuration/Setup Utility program and select <b>Memory Settings</b> from the Advanced Setup menu to enable the DIMM.</p> <p>2. If the problem remains, replace the failing DIMM.</p> <p>If the problem persists, call for service.</p>
301 303	<p>An error occurred during the keyboard and keyboard controller test. These error messages also might be accompanied by continuous beeping.</p> <p><b>Action:</b> Ensure that:</p> <ul style="list-style-type: none"> <li>• Nothing is resting on the keyboard and pressing a key.</li> <li>• No key is stuck.</li> <li>• The keyboard cable is connected correctly to the keyboard and to the correct connector on the appliance server.</li> </ul> <p>Running the diagnostic tests can isolate the appliance server component that failed, but you must have your system serviced. If the error message remains, call for service.</p> <p><b>Note:</b> If you just connected a new mouse or other pointing device, turn off the appliance server and disconnect that device. Wait at least 5 seconds; then, turn on the appliance server. If the error message goes away, replace the device.</p>
602	<p>Invalid diskette boot record</p> <p><b>Action:</b> 1. Replace the diskette.</p> <p>2. If the problem persists, make sure that the diskette drive cables are correctly and securely connected.</p> <p>3. If the problem remains, replace the diskette drive.</p> <p>If the problem persists, call for service.</p>
604	<p>An error occurred during a diskette drive test.</p> <p><b>Action:</b> 1. Verify that the Configuration/Setup Utility program correctly reflects the type of diskette drive that you have installed.</p> <p>2. Run the diagnostic tests. If the diagnostic tests fail, call for service.</p>
662	<p>A diskette drive configuration error occurred.</p> <p><b>Action:</b> If you removed a diskette drive, make sure that the diskette drive setting is correct in the Configuration/Setup Utility program. If the setting is not correct, change it.</p> <p>If the problem persists, call for service.</p>



Table 14. POST error messages.

POST message	Description
962	<p>A parallel port configuration error occurred.</p> <p><b>Action:</b> If you changed a hardware option, make sure that the parallel port setting is correct in the Configuration/Setup Utility program. If the setting is not correct, change it.</p> <p>If the problem persists, call for service.</p>
11xx	<p>An error occurred during the system-board serial port test.</p> <p><b>Action:</b> If you have a modem, serial printer, or other serial device attached to your appliance server, verify that the serial cable is connected correctly. If it is, use the following procedure:</p> <ol style="list-style-type: none"> <li>1. Turn off the appliance server.</li> <li>2. Disconnect the serial cable from the serial port.</li> <li>3. Wait five seconds; then, turn on the appliance server.</li> </ol> <p>If the POST error message does not reappear, either the serial cable or the device is probably failing. See the documentation that comes with the serial device for additional testing information.</p> <p>If the POST error message reappears, call for service.</p>
1162	<p>The serial port configuration conflicts with another device in the system.</p> <p><b>Action:</b></p> <ol style="list-style-type: none"> <li>1. Make sure the IRQ and I/O port assignments needed by the serial port are available.</li> <li>2. If all interrupts are being used by adapters, you might need to remove an adapter to make an interrupt available to the serial port, or force other adapters to share an interrupt.</li> </ol>
1601	<p>An Advanced Systems Management update is needed.</p> <p><b>Action:</b> Download and install the latest Advanced Systems Management flash update.</p>
1800	<p>A PCI adapter has requested a hardware interrupt that is not available.</p> <p><b>Action:</b></p> <ol style="list-style-type: none"> <li>1. Make sure that the PCI adapter and all other adapters are set correctly in the Configuration/Setup Utility program. If the interrupt resource settings are not correct, change the settings.</li> <li>2. If all interrupts are being used by other adapters, you might need to remove an adapter to make an interrupt available to the PCI adapter, or force other adapters to share an interrupt.</li> </ol>

Table 14. POST error messages.

POST message	Description
1962	<p>No valid startup devices were found. The system cannot find the startup drive or operating system.</p> <p><b>Action:</b> Be sure that the drive that you want to start from is in the startup sequence.</p> <ol style="list-style-type: none"> <li>1. Select <b>Start Options</b> from the Configuration/Setup Utility program main menu. If you are unable to set the startup sequence, call for service.</li> <li>2. Check the list of startup devices in the <b>Startup device</b> data fields. Is the drive you want to start from in the startup sequence? <ul style="list-style-type: none"> <li><b>Yes</b> Exit from this screen; then, select <b>Exit Setup</b> to exit from the Configuration/Setup menu. Go to step 3.</li> <li><b>No</b> Follow the instructions on the screen to add the drive; then, save the changes and exit from the Configuration/Setup menu. Restart the appliance server.</li> </ul> </li> <li>3. Is an operating system installed? <ul style="list-style-type: none"> <li><b>Yes</b> Turn off the appliance server. Go to step 4.</li> <li><b>No</b> Install the operating system in your appliance server; then, follow your operating system instructions to shut down and restart the appliance server.</li> </ul> </li> <li>4. During appliance server startup, watch for messages indicating a hardware problem.</li> </ol> <p>If the same error message appears, call for service.</p>
2400	<p>An error occurred during the testing of the video controller on the system board. This error can be caused by a failing monitor, a failing system board, or a failing video adapter (if one is installed).</p> <p><b>Action:</b> Verify that the monitor is connected correctly to the video connector. If the monitor is connected correctly, call for service.</p>
2462	<p>A video memory configuration error occurred.</p> <p><b>Action:</b> Make sure that the monitor cables are correctly and securely connected to the appliance server.</p> <p>If the problem persists, call for service.</p>
5962	<p>An IDE CD-ROM configuration error occurred.</p> <p><b>Action:</b> Check the signal and power cable connections to the CD-ROM drive.</p> <p>If the problem persists, call for service.</p>
8603	<p>An error occurred during the mouse (pointing device) controller test. The addition or removal of a mouse, or a failing system board can cause this error.</p> <p><b>Note:</b> This error also can occur if electrical power was lost for a very brief period and then restored. In this case, turn off the appliance server for at least 5 seconds; then, turn it back on.</p> <p><b>Action:</b> Ensure that the keyboard and mouse (pointing device) are attached to the correct connectors. If they are connected correctly, use the following procedure:</p> <ol style="list-style-type: none"> <li>1. Turn off the appliance server.</li> <li>2. Disconnect the mouse from the appliance server.</li> <li>3. Turn on the appliance server.</li> </ol> <p>If the POST error message does not reappear, the mouse is probably failing. See the documentation that comes with the mouse for additional testing information. If the problem remains, replace the mouse or pointing device.</p> <p>If the POST error message reappears, run the diagnostic tests to isolate the problem. If the diagnostic tests do not find a problem and the POST error message remains, call for service.</p>

Table 14. POST error messages.

POST message	Description
00012000	<p>Processor machine check.</p> <p><b>Action:</b> 1. Update the system BIOS. 2. If the problem persists, replace the microprocessor.</p>
00019501	<p>Processor 1 is not functioning.</p> <p><b>Action:</b> Replace microprocessor 1.</p> <p>If the problem persists, call for service.</p>
00019502	<p>Processor 2 is not functioning.</p> <p><b>Action:</b> Replace microprocessor 2.</p> <p>If the problem persists, call for service.</p>
00019701	<p>Processor 1 failed the built-in self-test.</p> <p><b>Action:</b> Replace microprocessor 1.</p> <p>If the problem persists, call for service.</p>
00019702	<p>Processor 2 failed the built-in self-test.</p> <p><b>Action:</b> Replace microprocessor 2.</p> <p>If the problem persists, call for service.</p>
00180100	<p>A PCI adapter has requested memory resources that are not available</p> <p><b>Action:</b> 1. Make sure that the PCI adapter and all other adapters are set correctly in the Configuration/Setup Utility program. If the memory resource settings are not correct, change the settings. 2. If all memory resources are being used, you might need to remove an adapter to make memory available to the PCI adapter. Disabling the adapter BIOS on the adapter might correct the error. See the documentation that is provided with the adapter.</p>
00180200	<p>A PCI adapter has requested an I/O address that is not available, or the PCI adapter might be defective.</p> <p><b>Action:</b> 1. Make sure that the I/O address for the PCI adapter and all other adapters are set correctly in the Configuration/Setup Utility program. 2. If the I/O port resource settings are correct, the PCI adapter might be defective. Call for service.</p>
00180300	<p>A PCI adapter has requested a memory address that is not available, or the PCI adapter might be defective.</p> <p><b>Action:</b> 1. Make sure that the memory addresses for all other adapters are set correctly in the Configuration/Setup Utility program. If the memory resource settings are not correct, change the settings. 2. If the memory resource settings are correct, the PCI adapter might be defective. Call for service.</p>
00180400	<p>A PCI adapter has requested a memory address that is not available.</p> <p><b>Action:</b> If all memory addresses are being used, you might need to remove an adapter to make memory address space available to the PCI adapter. Disabling the adapter BIOS on the adapter might correct the error. Refer to the documentation that is provided with the adapter.</p>
00180500	<p>A PCI adapter ROM error occurred.</p> <p><b>Action:</b> Remove the PCI adapters. If you can start the appliance server without the adapters, reinstall each adapter one at a time and retest after each is reinstalled. When an adapter fails, replace it.</p> <p>If you cannot isolate and correct the problem, call for service.</p>

Table 14. POST error messages.

POST message	Description
00180600	<p>A PCI-to-PCI bridge error occurred. More than one PCI bus tried to access memory below 1 MB.</p> <p><b>Action:</b> Remove the PCI adapter that has the PCI bridge. If you can start the appliance server without the adapter, reinstall and retest the adapter. If the adapter fails, replace it.</p> <p>If you cannot isolate and correct the problem, call for service.</p>
00180700	<p>xxxxyyyy system board PCI device does not respond or was disabled by the user (where xxxx is the PCI vendor ID and yyyy is the PCI device ID).</p> <p><b>Action:</b> Start the Configuration/Setup Utility program, select <b>Devices and I/O Ports</b>, and make sure that the device is enabled. If the problem persists, call for service.</p>
00180800	<p>An unsupported PCI device is installed.</p> <p><b>Action:</b> Remove the PCI adapters. If you can start the appliance server without the adapters, reinstall each adapter one at a time and retest after each is reinstalled. When an adapter fails, replace it.</p> <p>If the problem persists, call for service.</p>
00181000	<p>PCI error.</p> <p><b>Action:</b> Remove the PCI adapters. If you can start the appliance server without the adapters, reinstall each adapter one at a time and retest after each is reinstalled. When an adapter fails, replace it.</p> <p>If the problem persists, call for service.</p>
01295085	<p>The ECC checking hardware test failed.</p> <p><b>Action:</b> Call for service.</p>
01298001	<p>No update data is available for processor 1.</p> <p><b>Action:</b> Update the system BIOS to a level that supports the microprocessors that are installed in the appliance server.</p>
01298002	<p>No update data is available for processor 2.</p> <p><b>Action:</b> Update the system BIOS to a level that supports the microprocessors that are installed in the appliance server.</p>
01298101	<p>The update data for processor 1 is incorrect.</p> <p><b>Action:</b> Update the system BIOS to a level that supports the microprocessors that are installed in the appliance server.</p>
01298102	<p>The update data for processor 2 is incorrect.</p> <p><b>Action:</b> Update the system BIOS to a level that supports the microprocessors that are installed in the appliance server.</p>
01298200	<p>Microprocessor speed mismatch</p> <p><b>Action:</b> The microprocessors that are installed do not run at the same speed; install microprocessors with identical speeds.</p>
I9990301	<p>A hard disk drive error occurred.</p> <p><b>Action:</b> Call for service.</p>
I9990305	<p>POST could not find an operating system.</p> <p><b>Action:</b> Install an operating system. If you have already installed the operating system, check the drive startup sequence. If the drive sequence is correct, run the diagnostic tests to verify that the hard disk drive is functioning correctly. If there is a problem with the hard disk drive (such as a bad sector), you might need to reinstall the operating system.</p> <p>If you cannot reinstall the operating system, call for service.</p>

Table 14. POST error messages.

POST message	Description
I9990650	Power is restored. <b>Action:</b> No action is required. This message appears each time power is restored to the appliance server after a power loss.
Other Numbers	POST found an error. <b>Action:</b> Follow the instructions on the screen.

## Event/error logs

The POST error log contains the three most recent error codes and messages that the system generated during POST. The System Event/Error log contains all messages that were issued during POST and all system status messages from the Advanced Systems Management processor.

To view the contents of the System Event/Error log, start the Configuration/Setup Utility program; then, select **Event/Error Logs** from the main menu.

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## Diagnostic programs and error messages

The appliance server diagnostic programs are stored in upgradable read-only memory (ROM) on the system board or on the *IBM Enhanced Diagnostics* CD that comes with the appliance server. These programs are the primary method of testing the major components of your appliance server.

Diagnostic error messages indicate that a problem exists; they are not intended to be used to identify a failing part. Troubleshooting and servicing of complex problems that are indicated by error messages should be performed by trained service personnel.

Sometimes the first error to occur causes additional errors. In this case, the appliance server displays more than one error message. Always follow the suggested action instructions for the *first* error message that appears.

The following sections contain the error codes that might appear in the detailed test log and summary log when running the diagnostic programs.

The error code format is as follows:

fff-ttt-iii-date-cc-text message

where:

- fff** is the three-digit function code that indicates the function being tested when the error occurred. For example, function code 089 is for the microprocessor.
- ttt** is the three-digit failure code that indicates the exact test failure that was encountered. (These codes are for trained service personnel and are described in the *Hardware Maintenance Manual*.)
- iii** is the three-digit device ID. (These codes are for trained service personnel and are described in the *Hardware Maintenance Manual*.)
- date** is the date that the diagnostic test was run and the error recorded.
- cc** is the check value that is used to verify the validity of the information.
- text message** is the diagnostic message that indicates the reason for the problem.

## Text messages

The diagnostic text message format is as follows:

Function Name: Result (test specific string)

where:

<b>Function Name</b>	is the name of the function being tested when the error occurred. This corresponds to the function code (fff) given in the previous list.
<b>Result</b>	can be one of the following: <ul style="list-style-type: none"><li><b>Passed</b> This result occurs when the diagnostic test completes without any errors.</li><li><b>Failed</b> This result occurs when the diagnostic test discovers an error.</li><li><b>User Aborted</b> This result occurs when you stop the diagnostic test before it is complete.</li><li><b>Not Applicable</b> This result occurs when you specify a diagnostic test for a device that is not present.</li><li><b>Aborted</b> This result occurs when the test could not proceed because of the system configuration.</li><li><b>Warning</b> This result occurs when a possible problem is reported during the diagnostic test, such as when a device that is to be tested is not installed.</li></ul>
<b>Test Specific String</b>	This is additional information that you can use to analyze the problem.

## Starting the diagnostic programs

You can press F1 while running the diagnostic programs to obtain Help information. You also can press F1 from within a Help screen to obtain online documentation from which you can select different categories. To exit from Help, press Esc. You need to attach a mouse, monitor, and keyboard to use the diagnostic programs.

To start the diagnostic programs:

1. If you have a model 8672 appliance server, insert the *IBM Enhanced Diagnostics* CD in the CD-ROM drive on the appliance server.
2. Turn on the appliance server and watch the screen.
3. When the message F2 for Diagnostics appears, press F2.
4. Type the appropriate password; then, press Enter.
5. Select either **Extended** or **Basic** from the top of the screen.
6. When the Diagnostic Programs screen appears, select the test you want to run from the list that appears; then, follow the instructions on the screen.

### Notes:

- a. If the appliance server stops during testing and you cannot continue, restart the appliance server and try running the diagnostic programs again. If the problem persists, call for service.
- b. The keyboard and mouse (pointing device) tests assume that a keyboard and mouse are attached to the appliance server.

- c. If you run the diagnostic programs with no mouse attached to your appliance server, you will not be able to navigate between test categories using the **Next Cat** and **Prev Cat**. All other functions that are provided by mouse-selectable buttons are also available using the function keys.
- d. You can test the USB keyboard by using the regular keyboard test. The regular mouse test can test a USB mouse. Also, you can run the USB hub test only if there are no USB devices attached.
- e. You can view appliance server configuration information (such as system configuration, memory contents, interrupt request (IRQ) use, direct memory access (DMA) use, device drivers, and so on) by selecting **Hardware Info** from the top of the screen.

When the tests have completed, you can view the test log by selecting **Utility** from the top of the screen.

If the diagnostic programs do not detect an error but the problem persists during typical appliance server operations, a software error might be the cause. If you suspect a software problem, refer to the information that comes with the software package.

## Viewing the test log

The test log will not contain any information until after the diagnostic program has run.

**Note:** If you already are running the diagnostic programs, begin with step 3.

To view the test log:

1. Turn on the appliance server and watch the screen.  
If the appliance server is on, shut down your operating system and restart the appliance server.
2. When the message **F2 for Diagnostics** appears, press **F2**.  
If a power-on password is set, the appliance server prompts you for it. Type the appropriate password; then, press **Enter**.
3. When the **Diagnostic Programs** screen appears, select **Utility** from the top of the screen.
4. Select **View Test Log** from the list that appears; then, follow the instructions on the screen.

The system maintains the test-log data while the appliance server is powered on. When you turn off the power to the appliance server, the test log is cleared.

## Diagnostic error message tables

The following tables provide descriptions of the error messages that might appear when you run the diagnostic programs.

### Important:

If diagnostic error messages appear that are not listed in the following tables, make sure that your appliance server has the latest levels of BIOS and diagnostics microcode installed.

Table 15. Diagnostic error messages.

Code	Function	Result	Text message	Action
001	Core system	Failed	Processor board, ECC Test	Call for service.
			System board	
005	Video port		Processor and system boards	
011	Serial port		Integrated serial port	
014	Parallel port		Integrated parallel port	
015	USB interface	Aborted	Can NOT test USB interface while it is in use. <b>Note:</b> If you have a USB keyboard or mouse attached, you cannot run the diagnostic program for the USB interface.	<ol style="list-style-type: none"> <li>1. Turn off the appliance server.</li> <li>2. Replace the USB keyboard and mouse with a standard keyboard and mouse.</li> <li>3. Turn on the appliance server.</li> <li>4. Run the diagnostic test again.</li> </ol>
		Failed	System board	Call for service.
020	PCI interface	Failed	System board	Call for service.
030	SCSI interface	Failed	SCSI adapter in slot <i>n</i> failed register/counter/ power test  (where <i>n</i> is the slot number of the failing adapter)	Refer to the information provided with the adapter for instructions.  If the problem persists, call for service.
			SCSI controller on system board failed register/counter/power test	Call for service.
075	Power supply	Failed	Voltage sensed by the system is out of range	Call for service.



Table 15. Diagnostic error messages.

Code	Function	Result	Text message	Action
089	Microprocessor	Failed	Invalid microprocessor in slot xyz or BIOS setup problem  (where xyz identifies the microprocessor that is causing the error message)	<ol style="list-style-type: none"> <li>1. Check the system error log for the related error messages.</li> <li>2. If your appliance server does not have the latest level BIOS installed, update the BIOS.</li> <li>3. If the problem remains, replace the xyz microprocessor and run the test again.</li> </ol> <p>If the problem persists, call for service.</p>
			Processor in socket ID xyz is installed but not functioning  (where xyz identifies the microprocessor that is causing the error message)	
			Microprocessor in socket ID xyz  (where xyz identifies the microprocessor that is causing the error message)	<ol style="list-style-type: none"> <li>1. Reseat the microprocessor.</li> <li>2. If the problem remains, replace the microprocessor.</li> </ol> <p>If the problem persists, call for service.</p>
			Processor in socket id xyz is defective  (where xyz identifies the microprocessor that is causing the error message)	<p>Replace the microprocessor.</p> <p>If the problem persists, call for service.</p>
			Test setup error: Application microprocessor not installed or BIOS setup problem	<ol style="list-style-type: none"> <li>1. Verify that the Application microprocessor is installed and seated correctly.</li> <li>2. If your appliance server does not have the latest level BIOS installed, update the BIOS.</li> <li>3. If the problem remains, replace the application microprocessor and run the test again.</li> </ol> <p>If the problem persists, call for service.</p>

Table 15. Diagnostic error messages.

Code	Function	Result	Text message	Action
075	Microprocessor	Failed	VRM corresponding to Microprocessor in socket xyz is defective  (where xyz identifies the microprocessor whose VRM is causing the error message)	Replace the VRM.  If the problem remains, call for service.
			VRM corresponding to Microprocessor in socket ID xyz is not installed  (where xyz identifies the microprocessor whose VRM is causing the error message)	Install a VRM.  If the problem persists, call for service.
175	System thermal	Failed	Fan # <i>n</i>  (where <i>n</i> is the number of the failing fan)	Replace the indicated fan.
			Temperature sensed on processor board is out of range	Call for service.
180	Status display	Failed	Any failure message	Call for service.
201	System memory	Failed	DIMMs in location DIMM <i>n</i>  (where <i>n</i> is the number of the socket that contains the failing DIMM)	<ol style="list-style-type: none"> <li>1. Reseat the failing DIMM.</li> <li>2. If the problem remains, replace the DIMM.</li> </ol> <p>If the problem persists, call for service.</p>
			Test setup error: Corrupt BIOS in ROM	<p>If your appliance server does not have the latest level BIOS installed, update the BIOS to the latest level.</p> <p>If the problem persists, call for service.</p>
			Test setup error: Corrupt DMI BIOS, information in BIOS is not as expected	

Table 15. Diagnostic error messages.

Code	Function	Result	Text message	Action
202	System cache	Aborted	Test setup error: BIOS cannot access VPD information	If your appliance server does not have the latest level BIOS code installed, update the BIOS code to the latest level and run the diagnostic program again.  If the problem persists, call for service.
			Test setup error: Corrupt DMI BIOS. Information in BIOS is not as expected	
		Failed	Test setup error: No L2 cache detected on microprocessor socket ID xyz or BIOS setup problem  (where xyz identifies the microprocessor that is causing the error message)	1. If your appliance server does not have the latest level BIOS code installed, update the BIOS code to the latest level  2. Run the diagnostic program again.  3. If the problem remains, replace the failing processor.  If the problem persists, call for service.
			Test setup error: Unknown hardware problem associated with microprocessor in socket ID xyz.  (where xyz identifies the microprocessor that is causing the error message)	
Warning	Microprocessor in socket ID xyz  (where xyz identifies the microprocessor that is causing the error message)	1. Reseat the identified microprocessor.  2. If the problem remains, replace the microprocessor.  If the problem persists, call for service.		
			Test setup error: Cache is disabled. Use system setup to enable before retrying the test	Use the <b>Cache Control</b> choice from the Advanced Setup menu to enable the cache.  If the problem persists, call for service.
206	Diskette drive	Failed	Internal diskette drive bay	Call for service.
215	CD-ROM	Failed	On system board.	Call for service.
		Aborted	The CD-ROM drive is not present.	Verify that the cables are properly connected to the CD-ROM. If the problem persists, call for service.
217	Hard disk drive	Failed	BIOS drive # <i>n</i> (where <i>n</i> is the drive bay number)	Call for service.

Table 15. Diagnostic error messages.

Code	Function	Result	Text message	Action
264	Magnetic tape drive	Aborted	Test setup error: No tape drive found	<p>Check the cable and power connections to the drive.</p> <p>Refer to the information that is provided with the tape drive.</p> <p>If the problem persists, call for service.</p>
		Failed	The load/mount test failed for device <i>n</i> on adapter <i>m</i> (where <i>n</i> is the number of the device and <i>m</i> is the adapter number)	<p>Refer to the information provided with the tape drive.</p> <p>If the problem persists, call for service.</p>
			The self-diagnostic failed for device <i>n</i> on adapter <i>m</i> (where <i>n</i> is the number of the device and <i>m</i> is the adapter number)	
			The unload/eject test failed for device <i>n</i> on adapter <i>m</i> (where <i>n</i> is the number of the device and <i>m</i> is the adapter number)	
			The unload/eject push button test failed for device <i>n</i> on adapter <i>m</i> (where <i>n</i> is the number of the device and <i>m</i> is the adapter number)	
The read/write self-diagnostic failed for device <i>n</i> on adapter <i>m</i> (where <i>n</i> is the number of the device and <i>m</i> is the adapter number)	<p>Insert a new tape cartridge; then, run the diagnostic test again.</p> <p>Refer to the information that is provided with the tape drive.</p> <p>If the problem persists, call for service.</p>			
301	Keyboard	Failed	On system board keyboard test failed	<ol style="list-style-type: none"> <li>1. Verify that the keyboard cable is connected.</li> <li>2. If the problem remains, replace the keyboard cable.</li> </ol> <p>If the problem persists, call for service.</p>
302	Mouse	Failed	On system board pointing device test failed.	Replace the pointing device. If the problem persists, call for service.
305	Video monitor		Any message	Refer to the information that comes with the monitor.

Table 15. Diagnostic error messages.

Code	Function	Result	Text message	Action
405	Ethernet	Failed	In PCI slot <i>n</i> (where <i>n</i> is the PCI slot number in which the failing Ethernet adapter is installed)	Replace the Ethernet adapter in slot <i>n</i> . If the problem persists, call for service.
			On system board	Call for service.
415	Analog/digital modem	Not applicable	No modem was detected	<ol style="list-style-type: none"> <li>1. Verify that the modem is properly attached to the appliance server.</li> <li>2. If the problem remains, replace the modem.</li> </ol> <p>If the problem persists, call for service.</p>
			PCI modem detected but not enabled	<ol style="list-style-type: none"> <li>1. Change the configuration to enable the modem.</li> <li>2. If the problem remains, replace the modem.</li> </ol> <p>If the problem persists, call for service.</p>
		Failed	Modem reset failed	<p>Replace the modem.</p> <p>If the problem persists, call for service.</p>
			No dial tone detected	<ol style="list-style-type: none"> <li>1. Make sure that the phone line attached to the modem has a dial tone. (Connect a phone to the line and listen, if necessary.) If there is no tone, have the phone line serviced.</li> <li>2. If the problem remains, replace the modem.</li> </ol> <p>If the problem persists, call for service.</p>

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## Identifying problems on the model 8654 using status LEDs

If the system-error light in the operator information panel on the front of the appliance server is on, one or more LEDs inside the appliance server might be on. Use the Light Path Diagnostics panel to identify the type of error that occurred.

**Note:** Light Path Diagnostics is available on the xSeries 130 model 8654 only.

For LED locations see the “Light Path Diagnostics panel on the model 8654” on page 105.

The Light Path Diagnostics panel in your appliance server enables you to quickly identify the type of system error that occurred. The Light Path Diagnostics panel is located on the system board, just behind PCI adapter slot 1. When you press the Light Path Diagnostics button, the LED on the top-right corner of the panel illuminates. This shows that the diagnostic circuitry is working correctly.

Your appliance server is designed so that any LEDs that are illuminated can be illuminated again without power after you remove the cover. This feature helps you isolate the problem if an error causes the appliance server to shut down. See “Model 8654 Light Path Diagnostics table” on page 105.

**Important:** You have up to 12 hours to use the Light Path Diagnostic LEDs after the power is removed from the appliance server. After 12 hours, you must turn on the appliance server again to be able to use the Light Path Diagnostic LEDs to help locate system errors.

To view the LEDs on the system board:

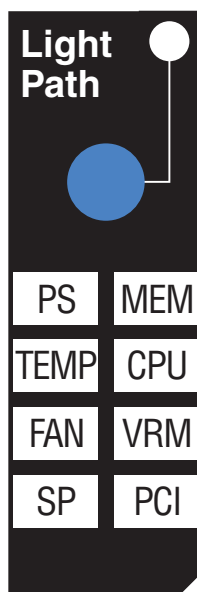
1. Turn off the appliance server and peripheral devices.
2. Remove all external cables from the appliance server; then, remove the appliance server from the rack and remove the cover. For more information see “Removing the cover” on page 56 for instructions.
3. Press and hold the Light Path Diagnostics (blue) button on the diagnostics panel. The LEDs will be illuminated while the switch is pressed.

**Note:** You can illuminate the LEDs for a maximum of 2 minutes. After that time, the circuit that powers the LEDs is exhausted.

4. Replace the cover on the appliance server; then, reinstall the appliance server in the rack and connect all external cables. For more information see “Installing the cover” on page 68 for instructions.

## Light Path Diagnostics panel on the model 8654

The following illustration shows the LEDs on the diagnostics panel on the system board. See “Model 8654 Light Path Diagnostics table” for information on identifying problems using these LEDs.



## Model 8654 Light Path Diagnostics table

The system-error light on the operator information panel is lit when certain system errors occur. If the system-error light on your appliance server is lit, use the following table to help determine the cause of the error and the action you should take.

Table 16. Light Path Diagnostics.

Lit LED on diagnostics panel	Cause	Action
None	An error has occurred and cannot be isolated, or the Advanced Systems Management processor has failed.	An error has occurred that is not represented by a Light Path Diagnostics LED. Check the system error log for more information about the error.
PS	Power supply has failed.	Have the system serviced.
TEMP	The system temperature has exceeded a threshold level.	<ol style="list-style-type: none"> <li>1. Check to see if a fan has failed. If it has, replace the fan.</li> <li>2. Make sure that the room temperature is not too hot. (See “The IBM xSeries 130 model 8654 appliance server” on page 5 or “The IBM xSeries 130 model 8672 appliance server” on page 8.)</li> </ol> <p>If the problem persists, have the system serviced.</p>
FAN	A fan has failed or is operating too slowly. <b>Note:</b> A failing fan can also cause the TEMP LED to be on.	Check the LEDs on the fans and replace the indicated fan.

Table 16. Light Path Diagnostics.

Lit LED on diagnostics panel	Cause	Action
SP	The service processor has failed.	Remove power from the appliance server, and then restart the appliance server.  If the problem persists have the system serviced.
MEM	A memory error occurred.	<ol style="list-style-type: none"> <li>1. Check the DIMM failure LEDs on the system board.</li> <li>2. Replace the DIMM that is indicated by the lit DIMM failure LED.</li> </ol>
CPU	One of the microprocessors has failed.	<ol style="list-style-type: none"> <li>1. Check the microprocessor failure LEDs on the system board.</li> <li>2. If a microprocessor failure LED is on, make sure that the microprocessor is installed correctly (see “Identifying problems on the model 8654 using status LEDs” on page 104).</li> <li>3. If the problem persists, replace the microprocessor.</li> </ol> <p>If the problem persists, have the system serviced.</p>
VRM	One of the VRMs on the system board has failed.	Remove power from the appliance server, and then restart the appliance server.  If the problem persists have the system serviced.
PCI	An error occurred on a PCI bus. The system board caused the error.	<ol style="list-style-type: none"> <li>1. Check the error log for additional information.</li> <li>2. If you cannot isolate the failing adapter from the information in the error log, try to determine the failing adapter by removing one adapter at a time from PCI bus B (PCI slots 1 and 2) and restarting the appliance server after each adapter is removed.</li> </ol> <p>If the problem persists, have the system serviced.</p>



## Troubleshooting charts

You can use the troubleshooting charts in this section to find solutions to problems that have definite symptoms.

Look for the symptom in the left column of the chart. Instructions and probable solutions to the problem are in the right column. If you have just added new software or a new option and your appliance server is not working, do the following before using the troubleshooting charts:

- Remove the software or device that you just added.
- Restart to determine if it is running correctly.
- Reinstall the new software or new device.

Table 17. Troubleshooting charts.

Device	Suggested action
<b>CD-ROM drive</b>	Verify that:
CD-ROM drive is not recognized.	<ul style="list-style-type: none"> <li>• The primary IDE channel is enabled in the Configuration/Setup Utility program.</li> <li>• All cables and jumpers are installed correctly.</li> <li>• The correct device driver is installed for the CD-ROM drive.</li> </ul>
<b>Diskette drive</b>	If there is a diskette in the drive, verify that:
Diskette drive activity light stays on.	<ul style="list-style-type: none"> <li>• The diskette drive is enabled in the Configuration/Setup Utility program.</li> <li>• The diskette is good and not damaged. (Try another diskette if you have one.)</li> <li>• Your software program is OK.</li> </ul> <p>If the diskette drive activity light stays on, call for service.</p>
<b>Intermittent problems</b>	Verify that:
A problem occurs only occasionally and is difficult to detect.	<ul style="list-style-type: none"> <li>• All cables and cords are connected securely to the rear of the server and attached options.</li> <li>• When the server is turned on, air is flowing from the rear of the server at the fan grill. If there is no airflow, the fan is not working. This causes the server to overheat and shut down.</li> <li>• Ensure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly.</li> </ul> <p>If the problem continues, call for service.</p>
<b>Keyboard, mouse, or pointing-device problems.</b>	<ul style="list-style-type: none"> <li>• Make sure that the appliance server and the monitor are turned on.</li> <li>• Try using another keyboard.</li> </ul>
All or some keys on the keyboard do not work.	<ul style="list-style-type: none"> <li>• Make sure that the C2T device breakout cable is properly connected to a model 8654 appliance server.</li> <li>• Make sure that the keyboard cable is properly connected to the C2T breakout cable.</li> </ul> <p>If the items above are correct but the problem continues, call for service.</p>
The mouse or pointing device does not work.	<ul style="list-style-type: none"> <li>• Verify that the mouse or pointing-device cable is securely connected and the device drivers are installed correctly.</li> <li>• Try using another mouse or pointing device.</li> </ul> <p>If the problem continues, call for service.</p>

Table 17. Troubleshooting charts.

Device	Suggested action
<b>Memory problems</b>	Verify that: <ul style="list-style-type: none"> <li>• The memory modules are seated properly.</li> <li>• You have installed the correct type of memory.</li> <li>• If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program.</li> <li>• All banks of memory on the DIMMs are enabled. The server might have automatically disabled a DIMM bank when it detected a problem, or a DIMM bank could have been manually disabled.</li> </ul> Look in the POST error log for error message 289: <ul style="list-style-type: none"> <li>• If the DIMM was disabled by a systems-management interrupt (SMI), replace the DIMM.</li> <li>• If the DIMM was disabled by the user or by POST:               <ol style="list-style-type: none"> <li>1. Start the Configuration/Setup Utility program.</li> <li>2. Enable the DIMM.</li> <li>3. Save the configuration and restart the server.</li> </ol> </li> <li>• If you continue to get this error, replace the DIMM.</li> </ul> If the problem continues, call for service.
<b>Microprocessor problems</b>	The startup (boot) microprocessor is not working properly.
The server emits a continuous tone during POST.	Verify that the startup microprocessor is seated properly.  If it is, call for service.
<b>Monitor problems</b>	Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, refer to the information that comes with the monitor for adjusting and testing instructions.  If you still cannot find the problem, call for service.
The screen is blank.	Verify that: <ul style="list-style-type: none"> <li>• The appliance server power cord is plugged into the appliance server and a working electrical outlet.</li> <li>• The monitor cables are connected properly.</li> <li>• The monitor is turned on and the brightness and contrast controls are adjusted correctly.</li> </ul> If the screen remains blank, call for service.
Only the cursor appears.	Call for service.
The monitor works when you turn on the server, but goes blank when you start some application programs.	Verify that you installed the necessary device drivers for the applications.  If the screen remains blank, call for service.

Table 17. Troubleshooting charts.

Device	Suggested action
<p>Wavy, unreadable, rolling, distorted screen, or screen jitter.</p>	<p>If the monitor self-tests show the monitor is working correctly, consider the location of the monitor. Magnetic fields around other devices (such as transformers, appliances, fluorescent lights, and other monitors) can cause screen jitter or wavy, unreadable, rolling, or distorted screen images. If this happens, turn off the monitor. (Moving a color monitor while it is turned on might cause screen discoloration.) Then move the device and the monitor at least 305 mm (12 in.) apart. Turn on the monitor.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• To prevent diskette drive read/ write errors, be sure that the distance between monitors and diskette drives is at least 76 mm (3 in.).</li> <li>• Non-IBM monitor cables might cause unpredictable problems.</li> <li>• An enhanced monitor cable with additional shielding is available for the IBM model 9521 and 9527 monitors. For information about the enhanced monitor cable, see your IBM reseller or IBM marketing representative.</li> </ul> <p>If the problem continues, call for service.</p>
<p>Wrong characters appear on the screen.</p>	<p>If the wrong language is displayed, update the BIOS code with the correct language.</p> <p>If the problem continues, call for service.</p>
<p><b>Option problems</b></p>	<p>Verify that:</p>
<p>An IBM option that was just installed does not work.</p>	<ul style="list-style-type: none"> <li>• The option is designed for the appliance server. Refer to the "Server Support" flowchart for information about obtaining ServerProven™ compatibility information from the World Wide Web.</li> <li>• You followed the installation instructions that came with the option.</li> <li>• The option is installed correctly.</li> <li>• You have not loosened any other installed options or cables.</li> <li>• You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration.</li> </ul> <p>If the problem continues, call for service.</p>
<p><b>Power problems</b></p>	<p>Verify that:</p>
<p>The appliance server does not power on.</p>	<ul style="list-style-type: none"> <li>• The power cables are properly connected to the appliance server.</li> <li>• The electrical outlet functions properly.</li> <li>• The type of memory installed is correct.</li> <li>• If you just installed an option, remove it, and restart the server. If the server now powers on, you might have installed more options than the power supply supports.</li> </ul> <p>If the problem continues, call for service.</p>
<p><b>Serial port problems</b></p>	<p>Verify that:</p>
<p>The number of serial ports identified by the operating system is less than the number of serial ports installed.</p>	<p>Each port is assigned a unique address by the Configuration/Setup Utility program and none of the serial ports are disabled.</p> <p><b>Note:</b> Management port is the same as a serial port connector, and is not available for use by the operating system. This port does not appear in the Configuration/Setup Utility program menus; it can be configured.</p> <p>If the problem continues, call for service.</p>

Table 17. Troubleshooting charts.

Device	Suggested action
A serial device does not work.	Verify that: <ol style="list-style-type: none"> <li>1. The device is compatible with the appliance server.</li> <li>2. The serial port is enabled and is assigned a unique address.</li> </ol> If the problem continues, call for service.
<b>Software problem</b>	To determine if problems are caused by the software, verify that:
Suspected software problem.	<ul style="list-style-type: none"> <li>• Your appliance server has the minimum memory requirements to use the software. For memory requirements, see the information that comes with the software.</li> </ul> <p><b>Note:</b></p> <p>If you have just installed an adapter or memory, you might have a memory address conflict.</p> <ul style="list-style-type: none"> <li>• The software is designed to operate on your appliance server.</li> <li>• Other software works on your appliance server.</li> <li>• The software that you are using works on another system.</li> </ul> <p>If you received any error messages when using the software program, see the information that comes with the software for a description of the messages and solutions to the problem.</p> <p>If the problem continues, contact your place of purchase.</p>
<b>Universal Serial Bus (USB) port problems</b>	Verify that:
A USB device does not work.	<ul style="list-style-type: none"> <li>• You are not trying to use a USB device during POST if you have a standard (non-USB) keyboard attached to the keyboard port.</li> </ul> <p><b>Note:</b> If a standard (non-USB) keyboard is attached to the keyboard port, the USB is disabled and no USB device will work during POST.</p> <ul style="list-style-type: none"> <li>• The correct USB device driver is installed.</li> <li>• Your operating system supports USB devices.</li> </ul> <p>If the problem continues, call for service.</p>

---

## Replacing the battery

When replacing the battery you must replace it with a lithium battery of the same type, from the same manufacturer. To avoid possible danger, read and follow the safety statement below.

To order replacement batteries, call 1-800-772-2227 within the United States, and 1-800-465-7999 or 1-800-465-6666 within Canada. Outside the U.S. and Canada, call your IBM reseller or IBM marketing representative.

**Note:** After you replace the battery, you must reconfigure your appliance server and reset the system date and time.

### 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.

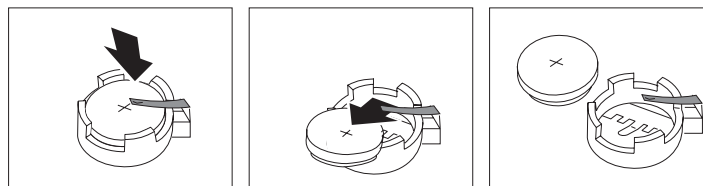
*Do not:*

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

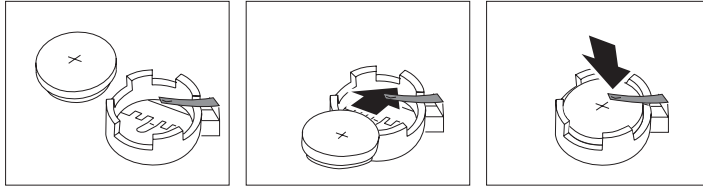
**Dispose of the battery as required by local ordinances or regulations.**

Complete the following steps to replace the battery:

1. Read “Safety” on page vii, and follow any special handling and installation instructions supplied with the replacement battery.
2. Turn off the appliance server and peripheral devices, and disconnect all external cables and power cords; then, remove the appliance server cover.
3. Remove the battery:
  - a. Use one finger to lift the battery clip over the battery.
  - b. Use one finger to slightly slide the battery out from its socket. The spring mechanism will push the battery out toward you as you slide it from the socket.
  - c. Use your thumb and index finger to pull the battery from under the battery clip.
  - d. Ensure that the battery clip is touching the base of the battery socket by pressing gently on the clip.



4. Insert the new battery:
  - a. Tilt the battery so that you can insert it into the socket, under the battery clip.
  - b. As you slide it under the battery clip, press the battery down into the socket.



5. Reinstall the appliance server cover, and connect the cables.
6. Turn on the appliance server.
7. Start the Configuration/Setup Utility program and set configuration parameters.
  - Set the system date and time.
  - Set the power-on password.
  - Reconfigure your appliance server.

---

## Using the Recovery CD

The *Recovery CD* for your xSeries 130 is used to recover the preinstalled software on your appliance server. You must start your appliance server with the recovery-enablement diskette, which is created using the *Supplementary CD*, before you can use the *Recovery CD*. Using the *Recovery CD* does not reset your BIOS.

**Attention:** Installing unauthorized service packs, or applications not included on the *Supplementary CD*, on your appliance server is not supported. You can obtain authorized updates to the installed software using the update function in UM Services, for more information, see “Configuring the xSeries 130 using Universal Manageability Services” on page 15.

## Recovering your appliance server using DiskCreator

To create a recovery-enablement diskette and recover the preinstalled software on your appliance server, do the following:

1. Using any workstation other than your appliance server, insert the *Supplementary CD* into the CD-ROM drive.

**Note:** The workstation that you use to create the recovery-enablement diskette must have one of the following operating systems installed:

- Microsoft Windows NT® Workstation
  - Microsoft Windows NT Server
  - Microsoft Windows 2000 Professional
  - Microsoft Windows 2000 Server
  - Microsoft Windows 2000 Advanced Server
  - Microsoft Windows 95
  - Microsoft Windows 98
2. Insert a formatted diskette into the diskette drive of the workstation, and run the *DiskCreator.exe* file that is located on the *Supplementary CD*.
  3. Follow the instructions to create a recovery-enablement diskette.
  4. Remove the recovery-enablement diskette from the diskette drive.

5. Go to the appliance server and insert the *Recovery* CD into the CD-ROM drive; then, insert the recovery-enablement diskette into the diskette drive of the appliance server.
6. Restart the appliance server. The recovery process begins automatically, and the preinstalled software is restored. After the preinstalled software is restored, the system restarts automatically, and all final operating-system configuration changes are performed.

**Note:** The recovery-enablement diskette is a one-use-only diskette. To use the *Recovery* CD again, you need to run the DiskCreator.exe file from the *Supplementary* CD.

When the appliance server restarts, a series of configuration and system-preparation programs configure the network operating system automatically. This process takes at least 15 minutes and must finish running before you can use any included applications such as the Advanced Appliance Configuration Utility or Terminal Services to connect or configure the xSeries 130. This applies the first time the xSeries 130 is started after the *Recovery* CD is used.

## Recovering your appliance server without DiskCreator

If you do not have one of the supported operating systems, you can use the following procedure to create a recovery-enablement diskette and recover the preinstalled software on your appliance server:

1. Insert a blank diskette into the diskette drive on a workstation other than the appliance server; then, format the diskette as a DOS diskette.
2. Insert the *Supplementary* CD into the CD-ROM drive in the workstation, and copy either the `reload.on` file or the `manufact.ure` file from the \Recovery Enablement directory on the CD to the diskette.

**Attention:** When you start the appliance server with the *Recovery* CD in the CD-ROM drive and the recovery-enablement diskette in the diskette drive, the recovery process starts. If you copy the `reload.on` file to the diskette, the recovery process installs the operating system, but does not delete the data partition D:. If you copy the `manufact.ure` file to the diskette, the recovery process deletes all partitions on the first hard disk in the appliance server and installs the operating system.

3. Go to the appliance server and insert the *Recovery* CD into the CD-ROM drive; then, insert the recovery-enablement diskette into the diskette drive of the appliance server.
4. Restart the appliance server. The recovery process begins automatically, and the preinstalled software is restored. After the preinstalled software is restored, the system restarts automatically, and all final operating-system configuration changes are performed.

**Note:** The recovery-enablement diskette is a one-use-only diskette. To use the *Recovery* CD again, you need to run the DiskCreator.exe file from the *Supplementary* CD.

When the appliance server restarts, a series of configuration and system-preparation programs configure the network operating system automatically. This process takes at least 15 minutes and must finish running before you can use any included applications such as the Advanced Appliance Configuration Utility or Terminal Services to connect or configure the xSeries 130. This applies the first time the xSeries 130 is started after the *Recovery* CD is used.

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## Getting information, help, and service

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

### Getting information

Information about your IBM server product and preinstalled software, if any, is available in the documentation that comes with your server. That documentation includes printed books, online books, README files, and help files. In addition, information about IBM products is available on the World Wide Web and through the IBM Automated Fax System.

#### Using the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM products and support. The address for the IBM Personal Computing home page is <http://www.ibm.com/pc/>.

You can find support information for your IBM products at <http://www.ibm.com/pc/support/>.

If you click **Profile** from the support page, you can create a customized support page that is specific to your hardware, complete with Frequently Asked Questions, Parts Information, Technical Hints and Tips, and Downloadable Files. In addition, you can choose to receive e-mail notifications whenever new information becomes available about your registered products.

You also can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

#### Getting information by fax

If you have a touch-tone telephone and access to a fax machine, in the U.S. and Canada, you can receive, by fax, marketing and technical information on many topics, including hardware, operating systems, and local area networks (LANs).

You can call the IBM Automated Fax System 24 hours a day, 7 days a week. Follow the recorded instructions, and the requested information will be sent to your fax machine. In the U.S. and Canada, to access the IBM Automated Fax System, call 1-800-426-3395.

### Getting help and service

If you have a problem with your server product you will find a wide variety of sources available to help you.

#### Using the documentation and diagnostic programs

Many problems can be solved without outside assistance. If you experience a problem with your server product, the first place to start is the troubleshooting information in your IBM documentation. If you suspect a software problem, see the documentation, including README files and online help, that comes with the operating system or application program.

Most IBM server products come with a set of diagnostic programs that you can use to help you identify hardware problems. See the troubleshooting information in your IBM documentation for instructions on 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/pc/support/> and follow the instructions.

## Calling for service

If you have tried to correct the problem yourself and still need help, during the warranty period, you can get help and information by telephone through the IBM HelpCenter®. The following services are available during the warranty period:

- **Problem determination** - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- **IBM hardware repair** - If the problem is determined to be caused by IBM hardware under warranty, trained service personnel are available to provide the applicable level of service.
- **Engineering Change management** - Occasionally, there might be changes that are required after a product has been sold. IBM or your reseller, if authorized by IBM, will make selected Engineering Changes (ECs) available that apply to your hardware.

The following items are not covered:

- Replacement or use of non-IBM parts or nonwarranted IBM parts. All warranted parts contain a 7-character identification in the format IBM FRU XXXXXXX.
- Identification of software problem sources.
- Configuration of BIOS as part of an installation or upgrade.
- Changes, modifications, or upgrades to device drivers.
- Installation and maintenance of network operating systems (NOS).
- Installation and maintenance of application programs.

Refer to your IBM hardware warranty for a full explanation of IBM warranty terms. Be sure to retain your proof of purchase to obtain warranty service.

In the U.S. and Canada, these services are available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9:00 a.m. to 6:00 p.m.

**Note:** Response time will vary depending on the number and complexity of incoming calls.

In addition, you are eligible for IBM Start Up Support for 90 days after installation. This service provides assistance for:

- Setting up your network operating system
- Installing and configuring interface adapters
- Installing and configuring network adapters

Please have the following information ready when you call:

- Machine type and model
- Serial numbers of your IBM hardware products
- Description of the problem
- Exact wording of any error messages
- Hardware and software configuration information

Phone numbers are subject to change without notice. For the most up-to-date phone numbers, go to <http://www.ibm.com/pc/support/> and click **Support Phone List**.

Country		Telephone number
Austria	Österreich	01-24 592 5901
Belgium - Dutch	Belgie	02-210 9820
Belgium - French	Belgique	02-210 9800
Canada	Toronto only	416-383-3344
Canada	Canada - all other	1-800-565-3344
Denmark	Danmark	45 20 82 00
Finland	Suomi	09-22 931 840
France	France	02 38 55 74 50
Germany	Deutschland	07032-1549 201
Ireland	Ireland	01-815 9202
Italy	Italia	02-482 9202
Luxembourg	Luxembourg	298-977 5063
Netherlands	Nederland	020-514 5770
Norway	Norge	23 05 32 40
Portugal	Portugal	21-791 51 47
Spain	España	91-662 49 16
Sweden	Sverige	08-477 4420
Switzerland	Schweiz/Suisse/Svizzera	058-333 0900
United Kingdom	United Kingdom	01475-555 055
U.S.A. and Puerto Rico	U.S.A. and Puerto Rico	1-800-772-2227

In all other countries, contact your IBM reseller or IBM marketing representative.

## Purchasing additional services

During and after the warranty period, you can purchase additional services, such as support for IBM and non-IBM hardware, operating systems, and application programs; network setup and configuration; upgraded or extended hardware repair services; and custom installations. Service availability and service name might vary by country.

For more information about these services, contact your IBM marketing representative.

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## Appendix A. Installing the xSeries 130 appliance server

The IBM xSeries 130 appliance server is designed to be installed in a rack cabinet. Use the *Rack Mounting Instructions* and template that come with the appliance server to install your appliance server in a rack cabinet. This section contains information found in the *Rack Mounting Instructions* and the *Installation Guide*.

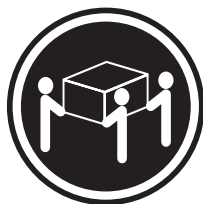
Review the documentation that comes with your rack cabinet for safety and cabling information. When installing your appliance server in a rack cabinet, consider the following:

- Ensure that the room air temperature is below 35°C (95°F).
- Do not block any air vents; typically, 15 cm (6 in.) of space provides proper airflow.
- Install your server in a rack cabinet with perforated doors.
- Plan the device installation starting from the bottom of the rack.
- Install the heaviest device in the bottom of the rack.
- Remove the rack doors and side panels to provide easier access during installation.
- Connect all power cords to properly wired and grounded electrical outlets.
- Take precautions to prevent overloading the power outlets when you install multiple devices in a rack.

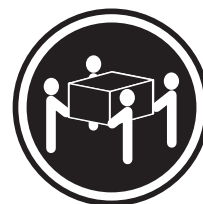
### Statement 4



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

### CAUTION:

**Use safe practices when lifting.**

- Do not place any object weighing more than 50 kg (110 lb) on top of rack-mounted devices that weigh more than 50 kg (110 lb)

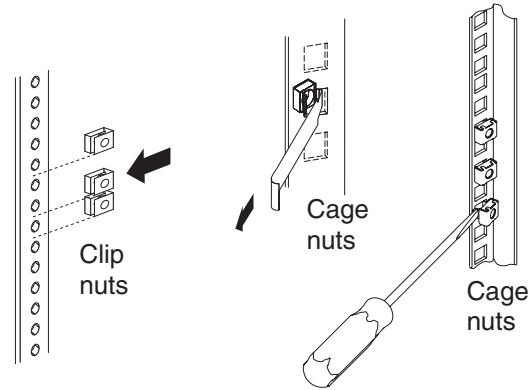
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## Installing your IBM xSeries 130 appliance server in the rack cabinet

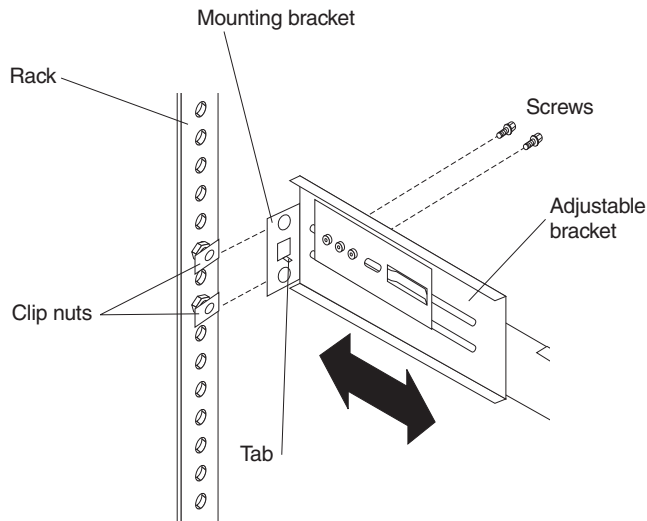
You will need the following items to complete the appliance server installation:

- Flat-blade screwdriver
- Phillips screwdriver
- Mounting brackets and hardware
- Cage nuts or clip nuts

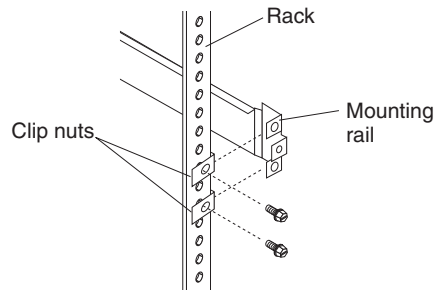
1. Write down the model number and serial number of your appliance server. This information is found on the right side of the bezel on the front corner. You need this information for connecting the appliance server to the network.
2. Select a one-U size location in the rack cabinet. Install a cage nut or clip nut in the top and bottom position of the one-U location that you selected (both sides, front and rear of the rack cabinet).



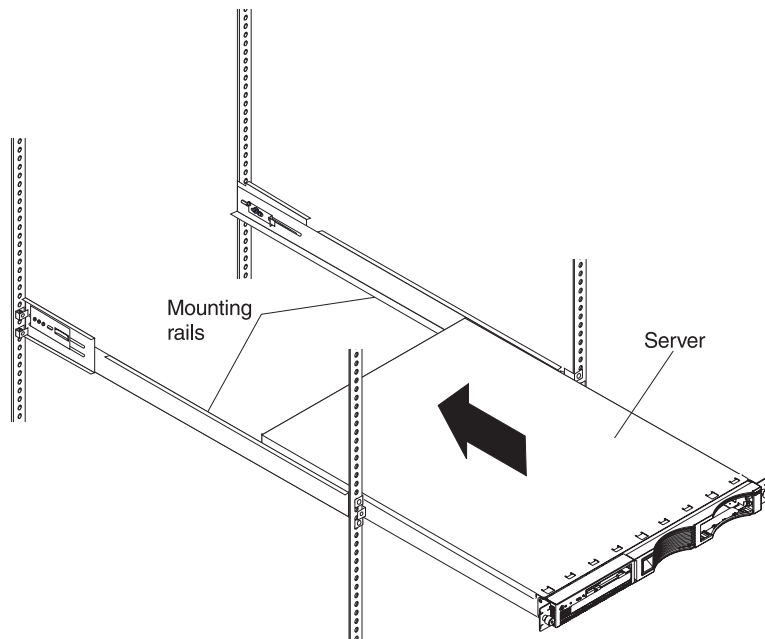
3. Adjust each rear mounting bracket (by loosening the screws) so that the inside distance between the two ends is equal to the outside dimension of the rack mounting flanges. Insert the bracket tab through the center hole between the two clip nuts on the rear mounting flanges. (The right and left rails are labeled.)



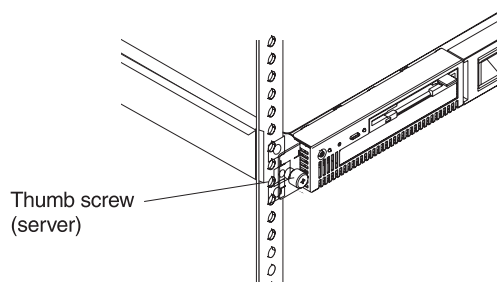
4. Loosely install two mounting screws through the back end of the bracket. Position the mounting bracket so that it lines up with the clip nuts. Install the remaining mounting screws; then, tighten all the screws with a screwdriver. Repeat these steps for each mounting bracket.



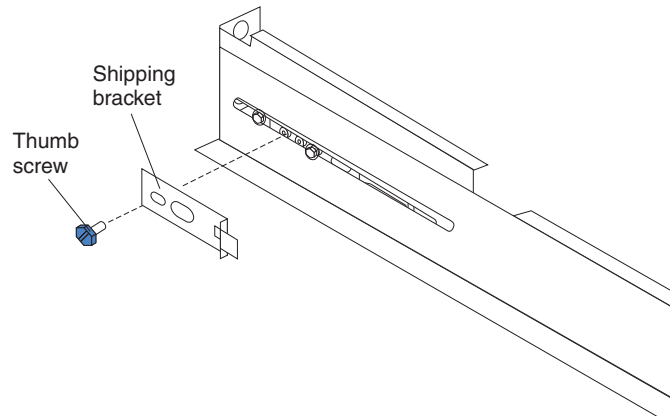
5. Place the server on the mounting brackets; then, slide it in as far as it will go.



6. Tighten the thumb screws on the front of the server to secure it to the rack cabinet.

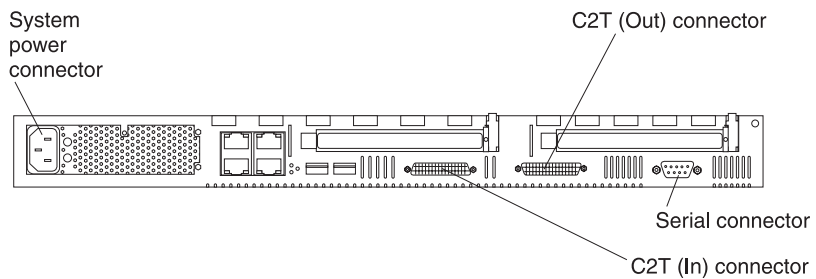


7. If you want to move your rack cabinet with the server installed, install the shipping brackets on each side of the server. Insert the shipping bracket tab into the slot on the back of the server. Then, use the blue thumb screw to secure the back of the server and the shipping bracket to the mounting bracket.



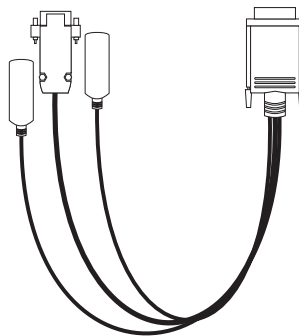
8. Connect the power cord and Ethernet cable. If you are cabling to the xSeries 130 model 8654 go to step 9. If you are cabling to the xSeries 130 model 8672 continue with step 11 on page 121.

**Note:** Ethernet port 1 is for managing the appliance server. Ethernet port 2 is for managing Internet content.



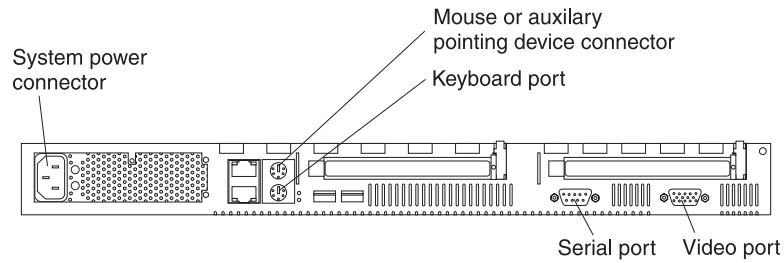
9. You can manage your server remotely from another computer on the network or locally with a keyboard, monitor, and mouse or other pointing device connected to your server. If you manage your server locally, you must use the C2T device breakout cable. Attach the large connector on the C2T cable to the C2T (Out) connector on the rear of your server; then, connect your keyboard, mouse, and monitor to the connectors on the end of the C2T cable.

**Note:** The keyboard and mouse connectors on the C2T cable have keyboard and mouse icons to differentiate them from each other. The monitor connector is dark blue.



10. Go to Step 12 on page 121.

11. You can manage your server remotely from another computer on the network or locally with a keyboard, monitor, and mouse or other pointing device connected to your server. If you manage your server locally, you must connect the keyboard, monitor, and mouse directly to the back of the xSeries 130 model 8672.



12. Repeat step 1 through step 11. for each server that you install in the rack.
13. Turn on your IBM xSeries 130 and wait 5 to 10 minutes. See “Turning on the appliance server” on page 11.

For information about using your appliance server configuration program, see Chapter 3, “Configuring your xSeries 130 appliance server,” on page 15.





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## Appendix B. Product warranty and notices

This appendix contains warranty and emission notices. It also contains trademarks and general-information notices.

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### Warranty information

This section contains the warranty period for your product and the IBM Statement of Limited Warranty.

### Warranty period

Contact your place of purchase for warranty service information. Some IBM Machines are eligible for on-site warranty service depending on the country or region where service is performed.

Machine - IBM @server xSeries 130
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<b>Warranty period</b> - Three years
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## IBM Statement of Limited Warranty

Z125-4753-06 8/2000

### Part 1 - General Terms

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

### The IBM Warranty for Machines

IBM warrants that each Machine 1) is free from defects in materials and workmanship and 2) conforms to IBM's Official Published Specifications ("Specifications"). The warranty period for a Machine is a specified, fixed period commencing on its Date of Installation. The date on your sales receipt is the Date of Installation unless IBM or your reseller informs you otherwise.

If a Machine does not function as warranted during the warranty period, and IBM or your reseller are unable to either 1) make it do so or 2) replace it with one that is at least functionally equivalent, you may return it to your place of purchase and your money will be refunded.

### Extent of Warranty

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, improper maintenance by you, or failure caused by a product for which IBM is not

responsible. The warranty is voided by removal or alteration of Machine or parts identification labels.

**THESE WARRANTIES ARE YOUR EXCLUSIVE WARRANTIES AND REPLACE ALL OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF EXPRESS OR IMPLIED WARRANTIES, SO THE ABOVE EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU. IN THAT EVENT, SUCH WARRANTIES ARE LIMITED IN DURATION TO THE WARRANTY PERIOD. NO WARRANTIES APPLY AFTER THAT PERIOD.**

### **Items Not Covered by Warranty**

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

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

### **Warranty Service**

To obtain warranty service for a Machine, contact IBM or your reseller. If you do not register your Machine with IBM, you may be required to present proof of purchase.

During the warranty period, IBM or your reseller, if approved by IBM to provide warranty service, provides without charge certain types of repair and exchange service to keep Machines in, or restore them to, conformance with their Specifications. IBM or your reseller will inform you of the available types of service for a Machine based on its country of installation. At its discretion, IBM or your reseller will 1) either repair or exchange the failing Machine and 2) provide the service either at your location or a service center. IBM or your reseller will also manage and install selected engineering changes that apply to the Machine.

Some parts of IBM Machines are designated as Customer Replaceable Units (called "CRUs"), e.g., keyboards, memory, or hard disk drives. IBM ships CRUs to you for replacement by you. You must return all defective CRUs to IBM within 30 days of your receipt of the replacement CRU. You are responsible for downloading designated Machine Code and Licensed Internal Code updates from an IBM Internet Web site or from other electronic media, and following the instructions that IBM provides.

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

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

You also agree to

1. ensure that the Machine is free of any legal obligations or restrictions that prevent its exchange;
2. obtain authorization from the owner to have IBM or your reseller service a Machine that you do not own; and
3. where applicable, before service is provided:
  - a. follow the problem determination, problem analysis, and service request procedures that IBM or your reseller provides;
  - b. secure all programs, data, and funds contained in a Machine;
  - c. provide IBM or your reseller with sufficient, free, and safe access to your facilities to permit them to fulfill their obligations; and
  - d. inform IBM or your reseller of changes in a Machine's location.

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

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

### **Limitation of Liability**

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

1. damages for bodily injury (including death) and damage to real property and tangible personal property; and
2. the amount of any other actual direct damages, up to the charges (if recurring, 12 months' charges apply) for the Machine that is subject of the claim. For purposes of this item, the term "Machine" includes Machine Code and Licensed Internal Code.

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

**UNDER NO CIRCUMSTANCES IS IBM LIABLE FOR ANY OF THE FOLLOWING: 1) THIRD-PARTY CLAIMS AGAINST YOU FOR DAMAGES (OTHER THAN THOSE UNDER THE FIRST ITEM LISTED ABOVE); 2) LOSS OF, OR DAMAGE TO, YOUR RECORDS OR DATA; OR 3) SPECIAL, INCIDENTAL, OR INDIRECT DAMAGES OR FOR ANY ECONOMIC CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST SAVINGS, EVEN IF IBM, ITS SUPPLIERS OR YOUR RESELLER IS INFORMED OF THEIR POSSIBILITY. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.**

### **Governing Law**

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

## Part 2 - Country-unique Terms

### AMERICAS

#### **BRAZIL**

**Governing Law:** *The following is added after the first sentence:*

Any litigation arising from this Agreement will be settled exclusively by the court of Rio de Janeiro.

#### **NORTH AMERICA**

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

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

#### **CANADA**

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

laws in the Province of Ontario.

#### **UNITED STATES**

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

laws of the State of New York.

### **ASIA PACIFIC**

#### **AUSTRALIA**

**The IBM Warranty for Machines:** *The following paragraph is added to this Section:*

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

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

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

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

laws of the State or Territory.

#### **CAMBODIA, LAOS, AND VIETNAM**

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

laws of the State of New York.

*The following is added to this Section:*

Disputes and differences arising out of or in connection with this Agreement shall be finally settled by arbitration which shall be held in Singapore in accordance with the rules of the International Chamber of Commerce (ICC). The arbitrator or arbitrators designated in conformity with those rules shall have the power to rule on their own

competence and on the validity of the Agreement to submit to arbitration. The arbitration award shall be final and binding for the parties without appeal and the arbitral award shall be in writing and set forth the findings of fact and the conclusions of law.

All proceedings shall be conducted, including all documents presented in such proceedings, in the English language. The number of arbitrators shall be three, with each side to the dispute being entitled to appoint one arbitrator.

The two arbitrators appointed by the parties shall appoint a third arbitrator before proceeding upon the reference. The third arbitrator shall act as chairman of the proceedings. Vacancies in the post of chairman shall be filled by the president of the ICC. Other vacancies shall be filled by the respective nominating party. Proceedings shall continue from the stage they were at when the vacancy occurred.

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

The English language version of this Agreement prevails over any other language version.

## **HONG KONG AND MACAU**

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

laws of Hong Kong Special Administrative Region.

## **INDIA**

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

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

## **JAPAN**

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

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

## **NEW ZEALAND**

**The IBM Warranty for Machines:** *The following paragraph is added to this Section:*

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

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

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

## **PEOPLE'S REPUBLIC OF CHINA (PRC)**

### **Governing Law:** *The following replaces this Section:*

Both you and IBM consent to the application of the laws of the State of New York (except when local law requires otherwise) to govern, interpret, and enforce all your and IBM's rights, duties, and obligations arising from, or relating in any manner to, the subject matter of this Agreement, without regard to conflict of law principles.

Any disputes arising from or in connection with this Agreement will first be resolved by friendly negotiations, failing which either of us has the right to submit the dispute to the China International Economic and Trade Arbitration Commission in Beijing, the PRC, for arbitration in accordance with its arbitration rules in force at the time. The arbitration tribunal will consist of three arbitrators. The language to be used therein will be English and Chinese. An arbitral award will be final and binding on all the parties, and will be enforceable under the Convention on the Recognition and Enforcement of Foreign Arbitral Awards (1958).

The arbitration fee will be borne by the losing party unless otherwise determined by the arbitral award.

During the course of arbitration, this Agreement will continue to be performed except for the part which the parties are disputing and which is undergoing arbitration.

## **EUROPE, MIDDLE EAST, AFRICA (EMEA)**

### ***THE FOLLOWING TERMS APPLY TO ALL EMEA COUNTRIES:***

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

### **Warranty Service:**

If you purchase an IBM Machine in Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland or United Kingdom, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM. If you purchase an IBM Personal Computer Machine in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Hungary, Kazakhstan, Kirghizia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, or Ukraine, you may obtain warranty service for that Machine in any of those countries from either (1) an IBM reseller approved to perform warranty service or (2) from IBM.

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

### **Governing Law:**

The applicable laws that govern, interpret and enforce rights, duties, and obligations of each of us arising from, or relating in any manner to, the subject matter of this Statement, without regard to conflict of laws principles, as well as Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided, except that in 1) Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Hungary, Former Yugoslav Republic of Macedonia, Romania,

Slovakia, Slovenia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan, the laws of Austria apply; 2) Estonia, Latvia, and Lithuania, the laws of Finland apply; 3) Algeria, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Democratic Republic of Congo, Equatorial Guinea, France, Gabon, Gambia, Guinea, Guinea-Bissau, Ivory Coast, Lebanon, Mali, Mauritania, Morocco, Niger, Senegal, Togo, and Tunisia, this Agreement will be construed and the legal relations between the parties will be determined in accordance with the French laws and all disputes arising out of this Agreement or related to its violation or execution, including summary proceedings, will be settled exclusively by the Commercial Court of Paris; 4) Angola, Bahrain, Botswana, Burundi, Egypt, Eritrea, Ethiopia, Ghana, Jordan, Kenya, Kuwait, Liberia, Malawi, Malta, Mozambique, Nigeria, Oman, Pakistan, Qatar, Rwanda, Sao Tome, Saudi Arabia, Sierra Leone, Somalia, Tanzania, Uganda, United Arab Emirates, United Kingdom, West Bank/Gaza, Yemen, Zambia, and Zimbabwe, this Agreement will be governed by English Law and disputes relating to it will be submitted to the exclusive jurisdiction of the English courts; and 5) in Greece, Israel, Italy, Portugal, and Spain any legal claim arising out of this Statement will be brought before, and finally settled by, the competent court of Athens, Tel Aviv, Milan, Lisbon, and Madrid, respectively.

**THE FOLLOWING TERMS APPLY TO THE COUNTRY SPECIFIED:**

**AUSTRIA AND GERMANY**

**The IBM Warranty for Machines:** *The following replaces the first sentence of the first paragraph of this Section:*

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

*The following paragraphs are added to this Section:*

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

**Extent of Warranty:** *The second paragraph does not apply.*

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

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

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

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

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

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

**EGYPT**

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

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

*Applicability of suppliers and resellers (unchanged).*

## FRANCE

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

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

## IRELAND

**Extent of Warranty:** *The following is added to this Section:*

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

**Limitation of Liability:** *The following replaces items one and two of the first paragraph of this Section:*

1. death or personal injury or physical damage to your real property solely caused by IBM's negligence; and
2. the amount of any other actual direct damages, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim.

*Applicability of suppliers and resellers (unchanged).*

*The following paragraph is added at the end of this Section:*

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

## ITALY

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

In each such instance unless otherwise provided by mandatory law, IBM is liable for no more than:

1. *(unchanged)*
2. as to any other actual damage arising in all situations involving nonperformance by IBM pursuant to, or in any way related to the subject matter of this Statement of Warranty, IBM's liability, will be limited to the total amount you paid for the Machine that is the subject of the claim.

*Applicability of suppliers and resellers (unchanged).*

*The following replaces the third paragraph of this Section:*

Unless otherwise provided by mandatory law, IBM and your reseller are not liable for any of the following: *(items 1 and 2 unchanged)* 3) indirect damages, even if IBM or your reseller is informed of their possibility.

## SOUTH AFRICA, NAMIBIA, BOTSWANA, LESOTHO AND SWAZILAND

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

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

## UNITED KINGDOM

**Limitation of Liability:** *The following replaces items 1 and 2 of the first paragraph of this Section:*



1. death or personal injury or physical damage to your real property solely caused by IBM's negligence;
2. the amount of any other actual direct damages or loss, up to 125 percent of the charges (if recurring, the 12 months' charges apply) for the Machine that is the subject of the claim or which otherwise gives rise to the claim;

*The following item is added to this paragraph:*

3. breach of IBM's obligations implied by Section 12 of the Sale of Goods Act 1979 or Section 2 of the Supply of Goods and Services Act 1982.

*Applicability of suppliers and resellers (unchanged).*

*The following is added to the end of this Section:*

IBM's entire liability and your sole remedy, whether in contract or in tort, in respect of any default shall be limited to damages.

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

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When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1000000 bytes, and GB stands for approximately 1000000000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1000000 bytes, and GB stands for 1000000000 bytes. Total user-accessible capacity may vary depending on operating environments.

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

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

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

## Electronic emission notices

### Federal Communications Commission (FCC) statement

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

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2)

this device must accept any interference received, including interference that may cause undesired operation.

### **Industry Canada Class A emission compliance statement**

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

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

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

### **Australia and New Zealand Class A statement**

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

### **United Kingdom telecommunications safety requirement**

#### **Notice to Customers**

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

### **European Union EMC Directive conformance statement**

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

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

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

### **Taiwan electrical emission statement**

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

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## Power cords

For your safety, IBM provides a power cord with a grounded attachment plug to use with this IBM product. To avoid electrical shock, always use the power cord and plug with a properly grounded outlet.

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA).

For units intended to be operated at 115 volts: Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a parallel blade, grounding-type attachment plug rated 15 amperes, 125 volts.

For units intended to be operated at 230 volts (U.S. use): Use a UL-listed and CSA-certified cord set consisting of a minimum 18 AWG, Type SVT or SJT, three-conductor cord, a maximum of 15 feet in length and a tandem blade, grounding-type attachment plug rated 15 amperes, 250 volts.

For units intended to be operated at 230 volts (outside the U.S.): Use a cord set with a grounding-type attachment plug. The cord set should have the appropriate safety approvals for the country in which the equipment will be installed.

IBM power cords for a specific country or region are usually available only in that country or region.

IBM power cord part number	Used in these countries and regions
13F9940	Argentina, Australia, China (PRC), New Zealand, Papua New Guinea, Paraguay, Uruguay, Western Samoa
13F9979	Afghanistan, Algeria, Andorra, Angola, Austria, Belgium, Benin, Bulgaria, Burkina Faso, Burundi, Cameroon, Central African Rep., Chad, China (Macau S.A.R.), Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Malagasy, Mali, Martinique, Mauritania, Mauritius, Monaco, Morocco, Mozambique, Netherlands, New Caledonia, Niger, Norway, Poland, Portugal, Romania, Senegal, Slovakia, Spain, Sudan, Sweden, Syria, Togo, Tunisia, Turkey, former USSR, Vietnam, former Yugoslavia, Zaire, Zimbabwe
13F9997	Denmark
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka

<b>IBM power cord part number</b>	<b>Used in these countries and regions</b>
14F0033	Antigua, Bahrain, Brunei, Channel Islands, China (Hong Kong S.A.R.), Cyprus, Dubai, Fiji, Ghana, India, Iraq, Ireland, Kenya, Kuwait, Malawi, Malaysia, Malta, Nepal, Nigeria, Polynesia, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Kingdom, Yemen, Zambia
14F0051	Liechtenstein, Switzerland
14F0069	Chile, Ethiopia, Italy, Libya, Somalia
14F0087	Israel
1838574	Thailand
6952301	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Liberia, Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Saudi Arabia, Suriname, Taiwan, Trinidad (West Indies), United States of America, Venezuela

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