



xSeries 130

Installation Guide

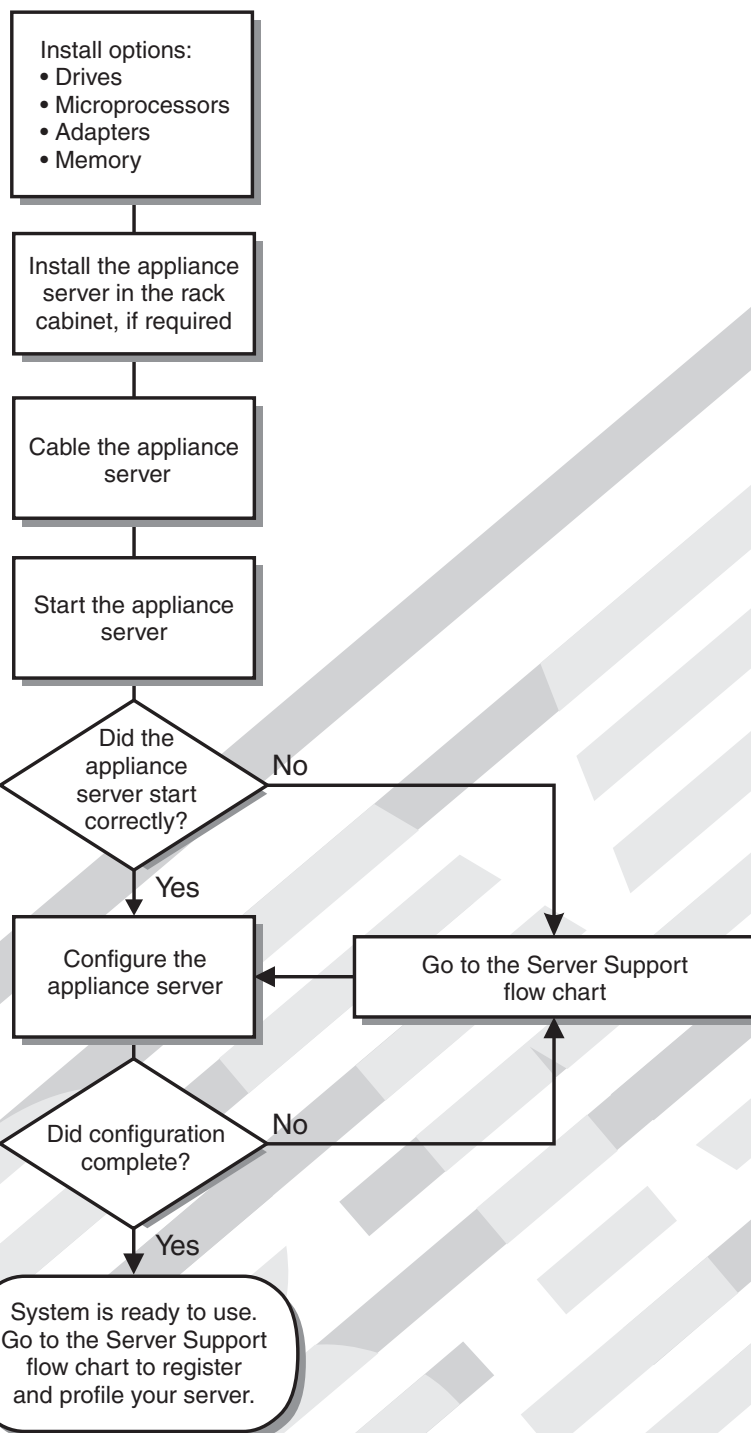
Welcome...

Thank you for buying an IBM xSeries appliance server.

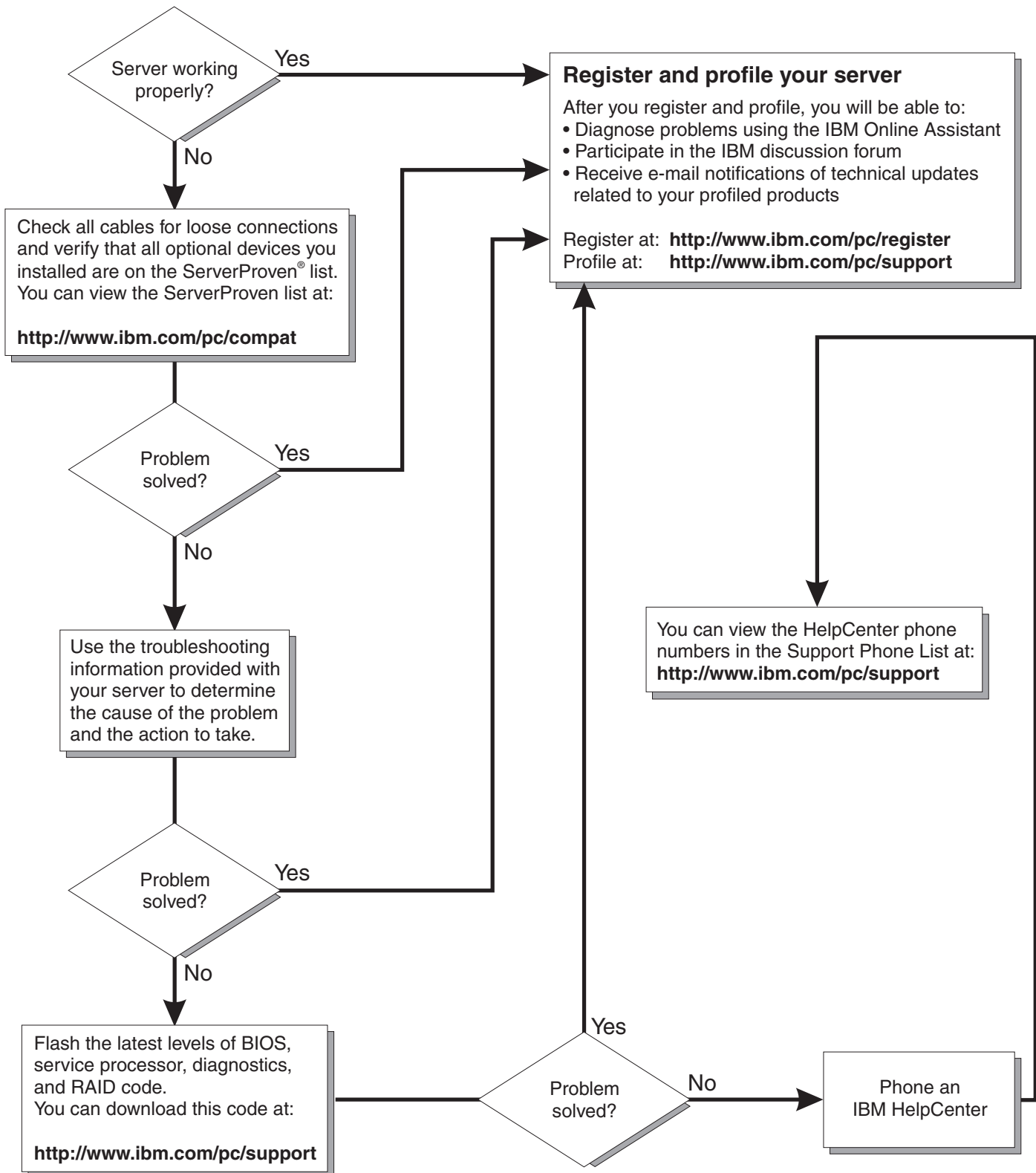
This *Installation Guide* contains information for setting up and configuring your appliance server.

For detailed information about your appliance server, view the *User's Reference* on the Documentation CD.

You also can find the most current information about your server on the IBM Web site at: <http://www.ibm.com/pc/support>



Server Support



IBM xSeries 130



Installation Guide

Note: Before using this information and the product it supports, be sure to read the general information in Appendix A, “Product warranty and notices,” on page 61.

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Safety

Before installing this product, read the Safety Information.

مج، يجب قراءة دات السلامة

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.

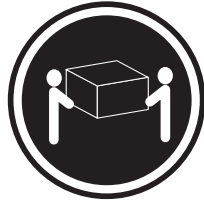


DANGER

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.

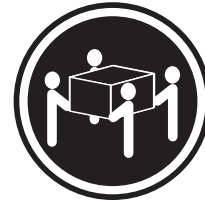
Statement 4



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



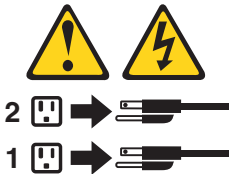
≥ 55 kg (121.2 lb)

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

Thank you for purchasing an IBM® eServer xSeries 130 appliance server. This *Installation Guide* provides the information that is needed to:

- Set up and cable your appliance server
- Start and configure your appliance server

Packaged with the *Installation Guide* are the following items:

- *IBM xSeries 130 and xSeries 135 Documentation CD*
- *Supplementary CD*
- *Recovery CD*
- *Multiple Language User Interface CD*
- *Rack Mounting Instructions* and template

Your xSeries 130 appliance server comes with a limited warranty and IBM Server Start Up Support. If you have access to the World Wide Web, you can obtain up-to-date information about your xSeries 130 and other IBM server products at <http://www.ibm.com/eserver/xseries>.

Record your product information in this table.	
Product name	_____
Type	_____
Model number	_____
Serial number	_____

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 for configuring your appliance server, and when you register your appliance server with IBM.

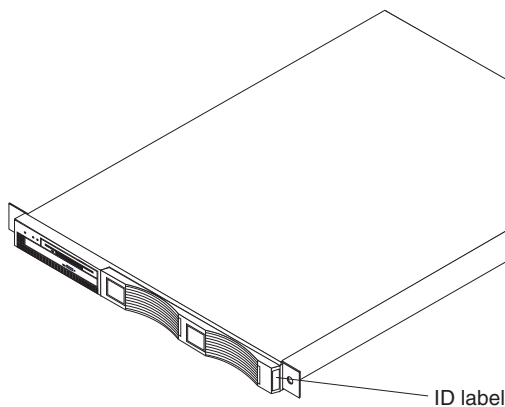


Figure 1. Locating the ID label

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

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.

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 appliance server

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 appliance servers 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 appliance servers
- Automatic assignment of static IP addresses from a specified range to newly installed appliance servers
- 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 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 email 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 appliance server. 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 9.

Features and specifications

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

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

Major components of the model 8654 appliance server

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

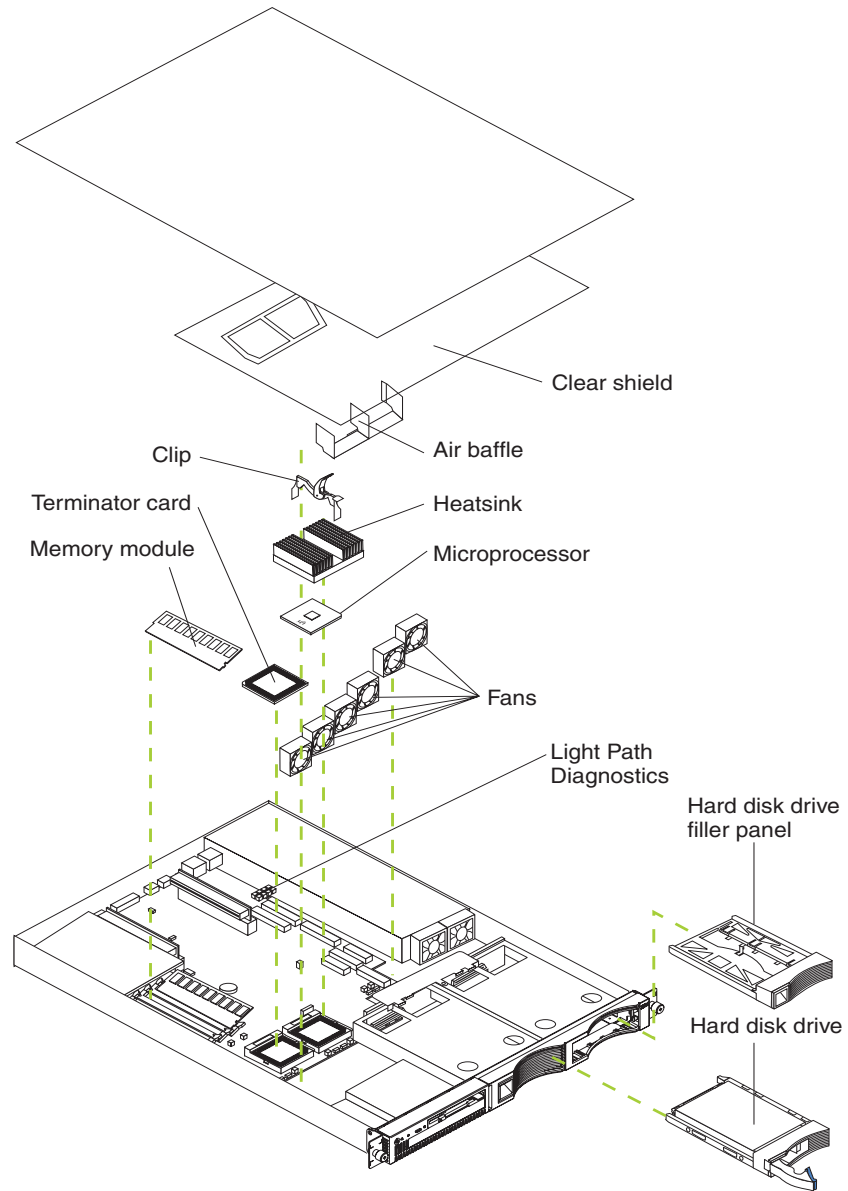


Figure 2. Viewing the major components of the xSeries 130 model 8654

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

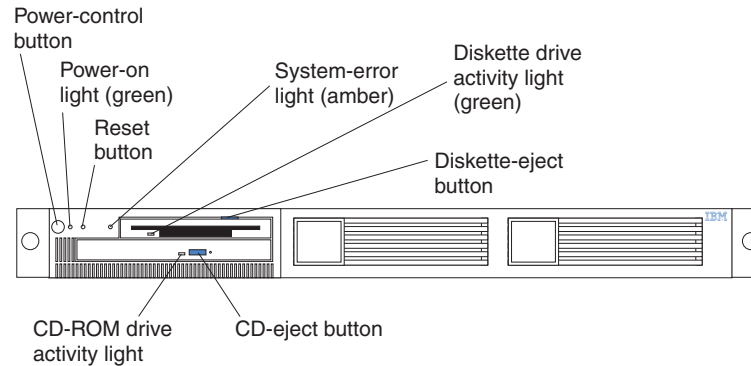


Figure 3. Identifying appliance server controls and indicators on the xSeries 130 model 8654

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

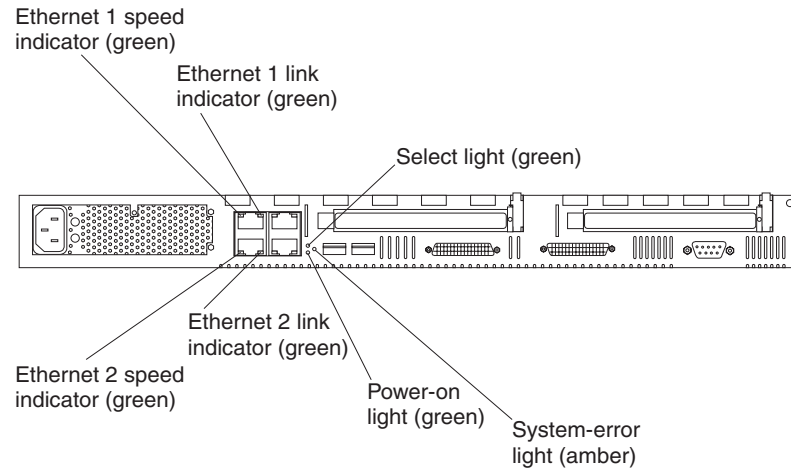


Figure 4. Identifying appliance server controls and indicators on the xSeries 130 model 8654

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

Major components of the model 8672 appliance server

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

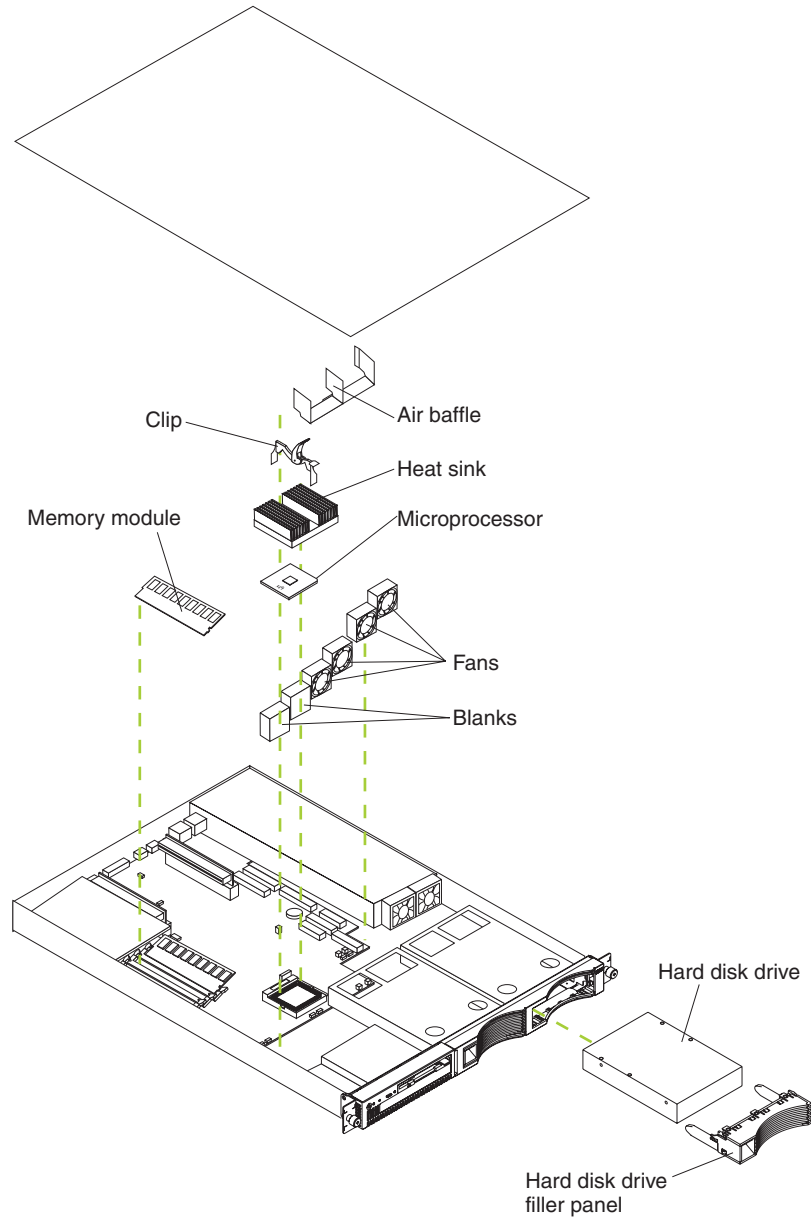


Figure 5. Viewing the major components of the xSeries 130 model 8672

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

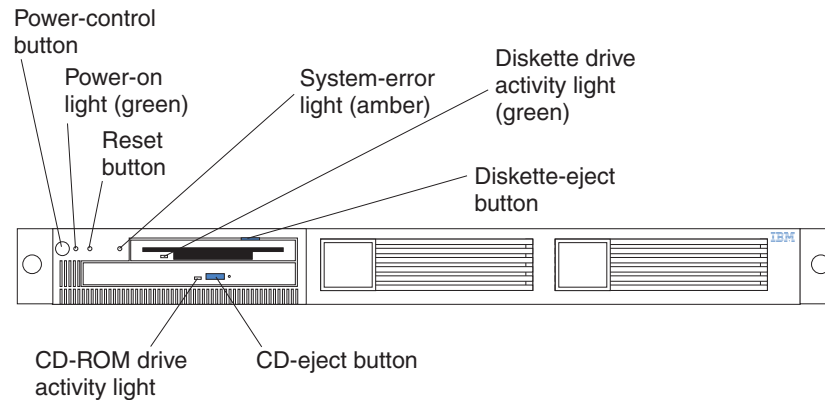


Figure 6. Identifying appliance server controls and indicators on the xSeries 130 model 8672

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

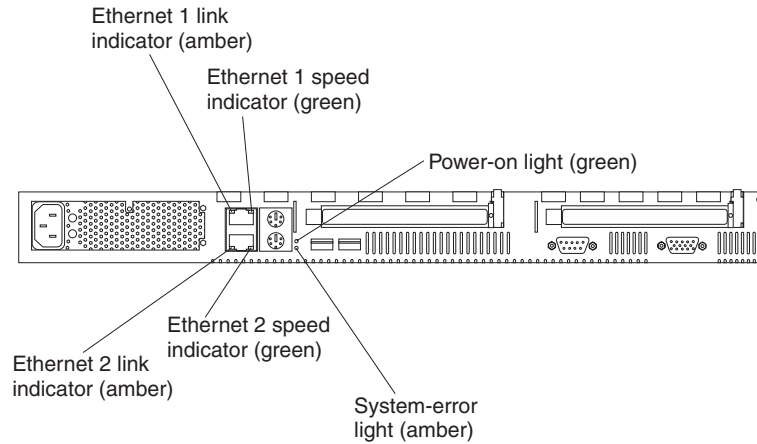


Figure 7. Identifying appliance server controls and indicators on the xSeries 130 model 8672

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.

Chapter 2. Installing your appliance server

This chapter provides instructions for installing options in your appliance server, and installing the appliance server in a rack cabinet. For a list of supported options for your appliance server, see the ServerProven[®] list at <http://www.ibm.com/pc/compat> on the World Wide Web. If you do not have any options to install, continue with “Installing the appliance server in a rack cabinet” on page 24.

Before you begin

To install options in your appliance server, begin by reading the following information; then, go to “Removing the cover” on page 14.

- Become familiar with the safety and handling guidelines specified under “Handling static-sensitive devices”, and read the safety statements in “Safety” on page v. 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.
- 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>.

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.

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 v.
2. Turn off the appliance server and all attached devices and disconnect all external cables and power cords.
3. Remove the two screws from the rear of the appliance server.
4. Pull out on the cover-release lever at the back of the appliance server to release the cover.
5. Slide the cover back, then up and off the appliance server.

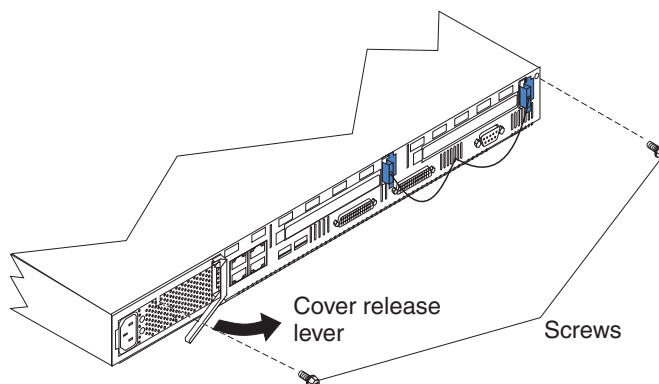


Figure 8. Removing the cover

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.

6. Continue with “Installing hard disk drives” on page 15, “Installing memory” on page 17, “Installing adapters in the model 8654” on page 19, or “Installing a microprocessor on the model 8654” on page 22.

Installing hard disk drives

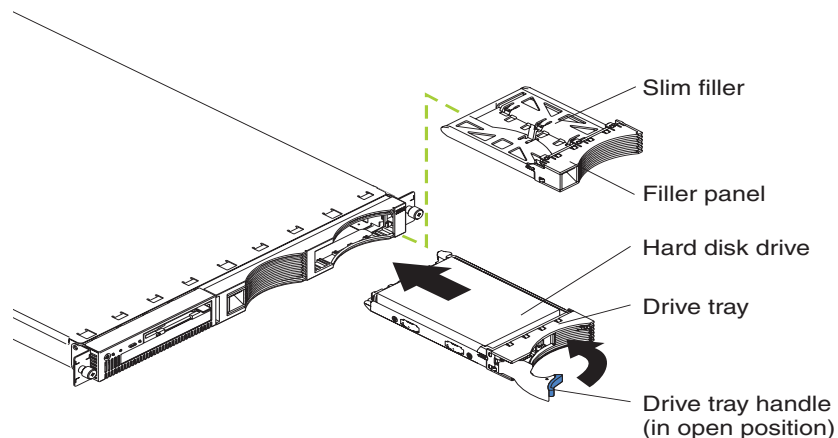
Your appliance server supports two 26 mm (1-in.), slim, 3.5-inch hard disk drives. Model 8654 appliance servers support SCSI hard disk drives, while model 8672 appliance servers support IDE hard disk drives. Before you install a hard disk drive, review the following:

- 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 13.
- 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 v.
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.
6. Continue with “Installing memory” on page 17, “Installing adapters in the model 8654” on page 19, “Installing a microprocessor on the model 8654” on page 22, “Installing the cover” on page 24, or “Installing the appliance server in a rack cabinet” on page 24.

Installing an IDE hard disk drive in the model 8672

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

1. Review the information in “Safety” on page v.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. 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.
4. Remove the filler panel from the available hard disk drive bay.
5. 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.

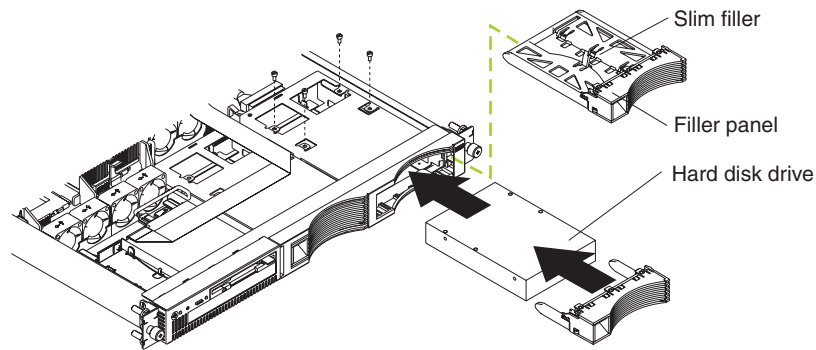


Figure 9. Installing the hard drive

- 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.
6. If you have other options to install, install them now.
 7. Continue with “Installing memory” on page 17, or “Installing the cover” on page 24.

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.

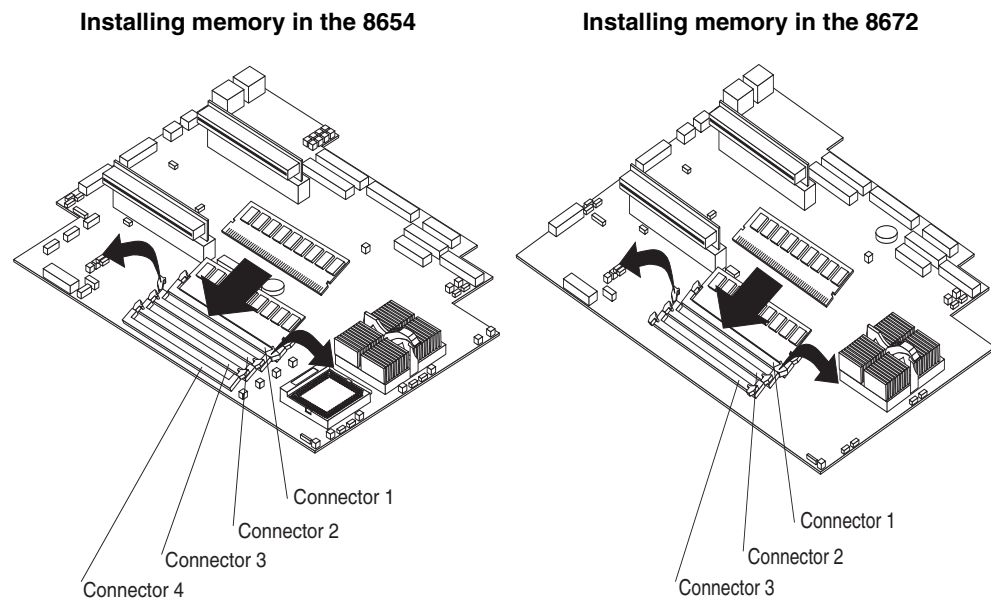


Figure 10. Installing memory

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 13.

1. Review the information in “Safety” on page v.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. If necessary, remove the PCI adapter in slot 2 for easier access to the DIMM connectors.
4. Touch the static-protective package containing the DIMM to any unpainted metal surface on the appliance server. Then, remove the DIMM from the package.
5. 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.
6. 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 38.
 - 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**.
 7. If you have other options to install, install them now.
 8. Continue with “Installing adapters in the model 8654” on page 19, “Installing a microprocessor on the model 8654” on page 22, or “Installing the cover” on page 24.

Installing adapters in the model 8654

The xSeries 130 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.

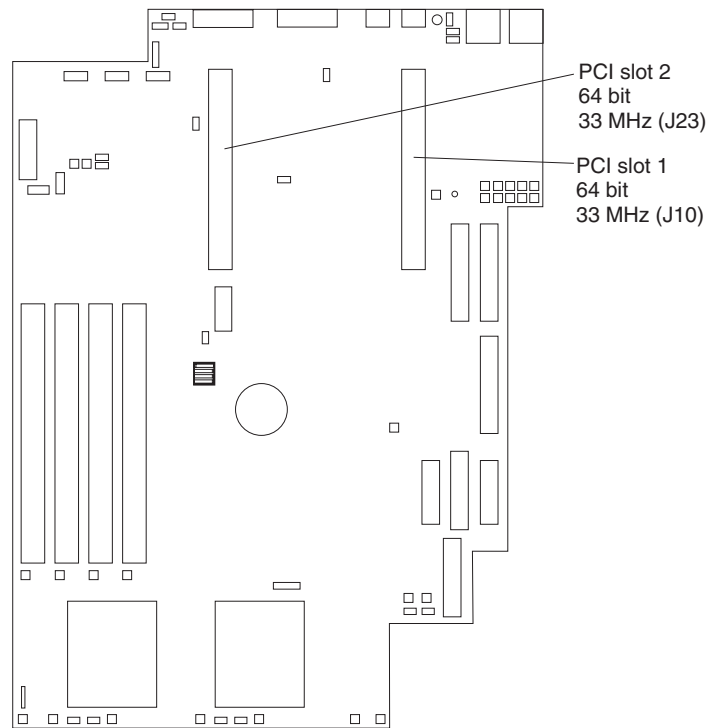


Figure 11. Identifying adapter placement

Adapter considerations

Before you install adapters in the xSeries 130 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 13.

1. Review the information in “Safety” on page v.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. 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.
4. Remove the expansion-slot cover.
5. See the documentation that comes with your adapter for any cabling instructions.

Note: Route internal adapter cables before you install the adapter.

6. Set any jumpers or switches as described by the adapter manufacturer.
7. 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.

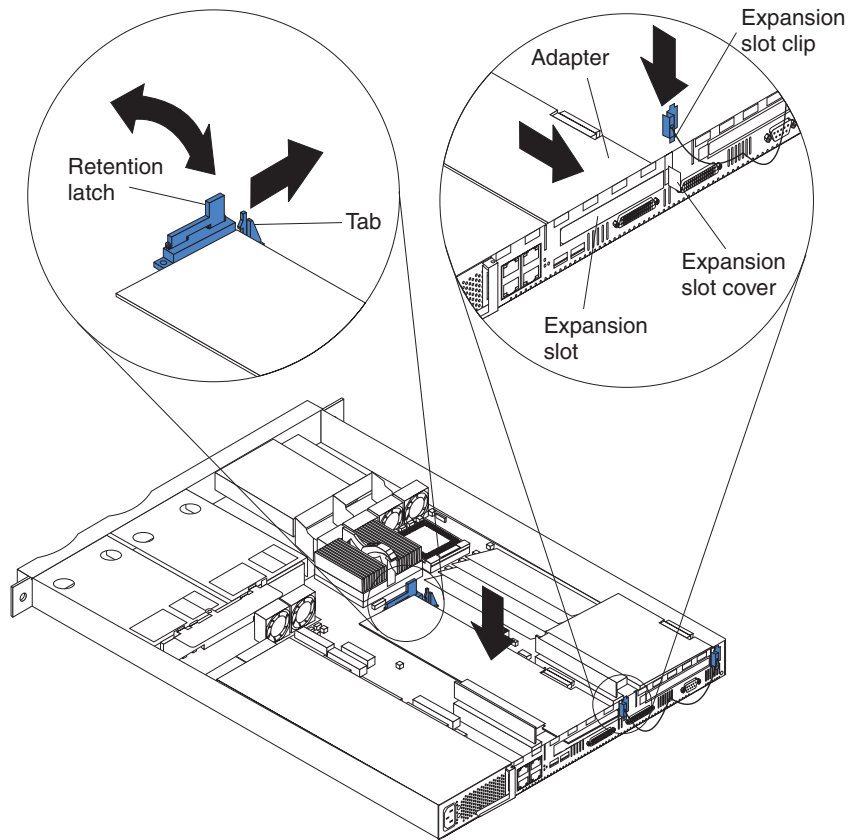
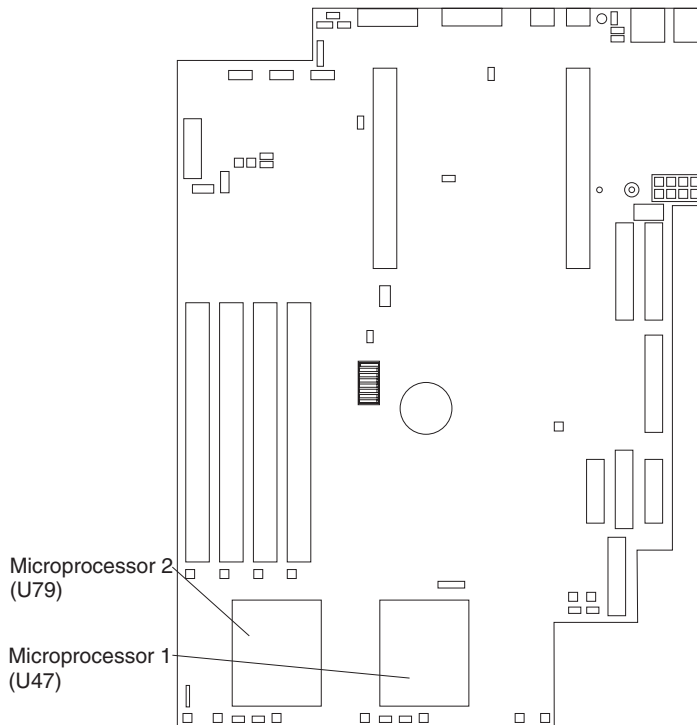


Figure 12. Installing the adapter

8. 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.
9. If you have other options to install, install them now.
10. Continue with “Installing a microprocessor on the model 8654” on page 22 or “Installing the cover” on page 24.

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.

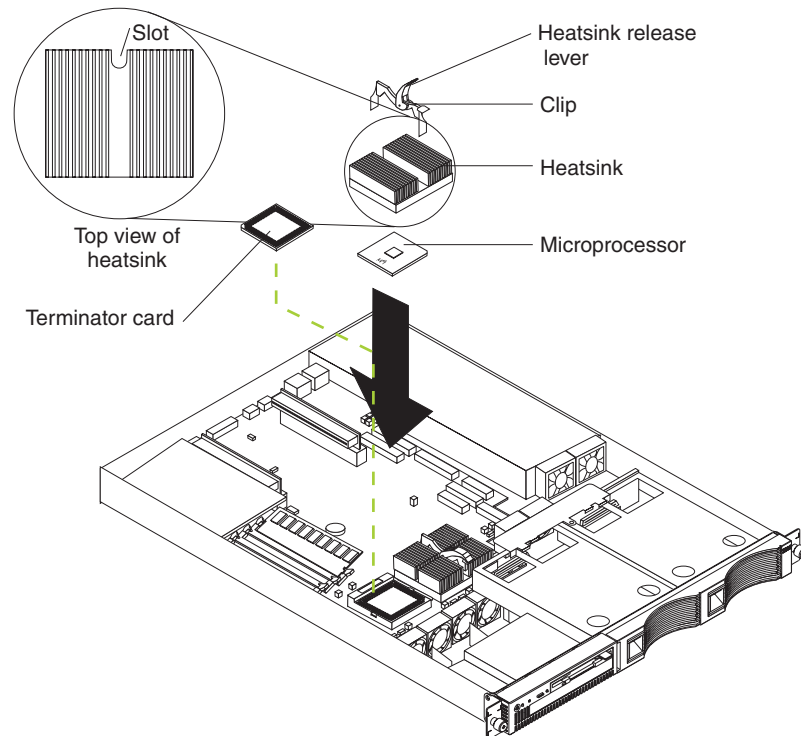
Complete the following steps to install a second microprocessor:

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 13.

1. Review the information in “Safety” on page v.
2. Turn off the appliance server and disconnect all external cables and power cords.
3. Remove the plastic shield from the server.
4. Lift up the microprocessor release lever and remove the terminator card from the microprocessor connector.
5. Install the microprocessor in the microprocessor connector.
Attention: To avoid bending the pins, do not use excessive force.
6. Push the release lever down to lock the microprocessor into place.
7. Install the heat sink onto the microprocessor.



8. Replace the clear shield.
Note: The clear shield must be installed to maintain proper air flow and cooling inside the server.
9. Continue with “Installing the cover” on page 24.

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.

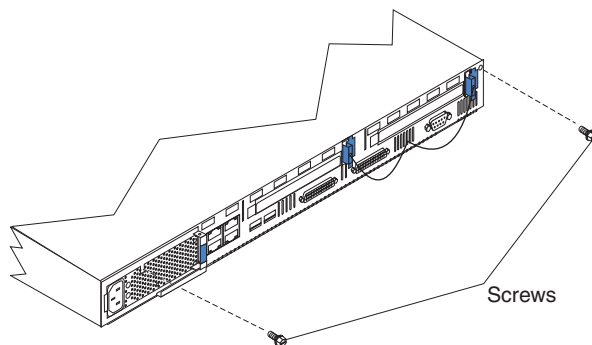


Figure 13. Installing the cover

5. Continue with “Installing the appliance server in a rack cabinet”.

Installing the appliance server in a rack cabinet

Install the appliance server in the rack cabinet using the *Rack Mounting Instructions* and template that come with your appliance server. Then, return to this manual and continue with “Cabling the 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 25.
- 8672, see “Cabling the model 8672 appliance server” on page 29.

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.

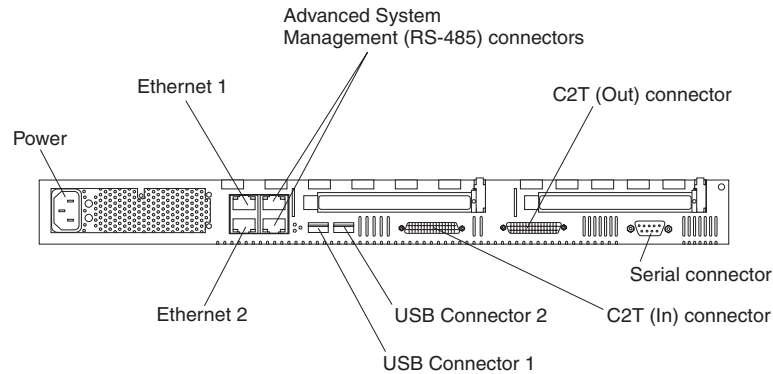


Figure 14. Identifying the xSeries 130 model 8654 connectors

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 26.

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.

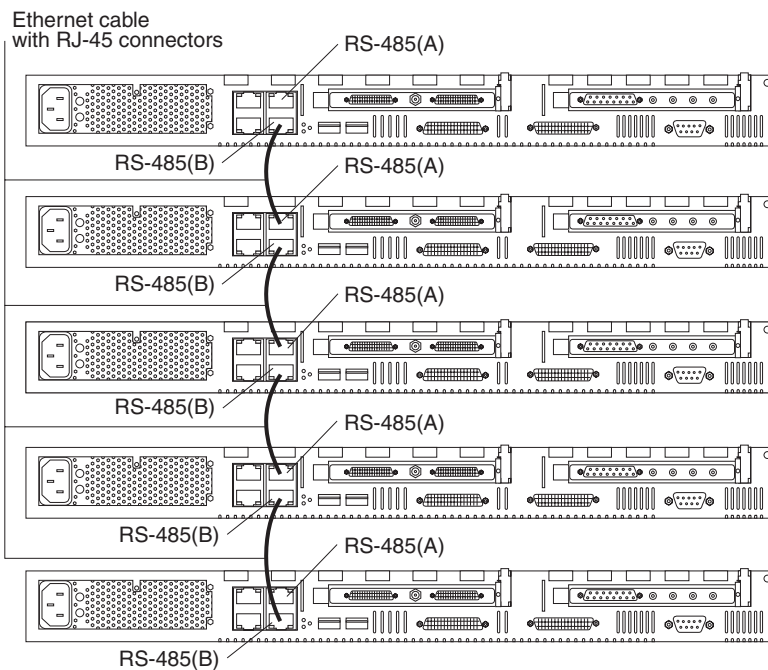


Figure 15. Viewing an ASM interconnect network

5. Continue to “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.

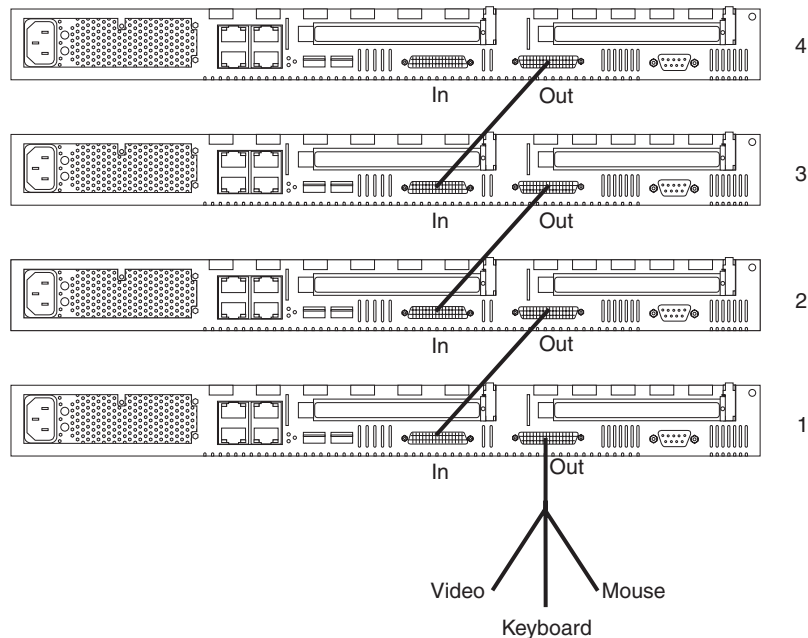


Figure 16. Viewing a C2T interconnect

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. See “Turning on the appliance server” on page 30.
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. Review “Using the C2T feature”; then, continue with Chapter 3, “Configuring your appliance server,” on page 33.

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.

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 “Features and specifications” 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 appliance server; then, go to “Turning on the appliance server” on page 30.

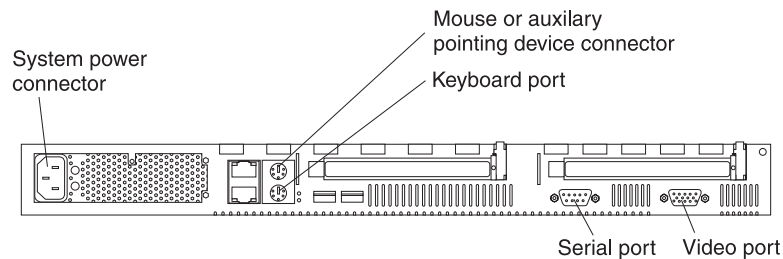


Figure 17. Locating the connectors

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.

Turning on and turning off your server

This section describes how to turn on and turn off the appliance server.

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.**

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.

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

Note: Plugging the power cord into a power source may 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

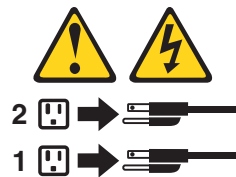
Turning off the appliance server refers to the act of disconnecting the appliance server from the power source.

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 “Appliance setup and configuration Web page” on page 34 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 “Appliance setup and configuration Web page” on page 34 for more information.
2. Press the power-control button on the front of the appliance server.

Chapter 3. Configuring your 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 37.

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 25 or “Cabling the model 8672 appliance server” on page 29.

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 41.

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 34).
- 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 remote workstation is connected to the appliance server 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 the UM Services Web page.
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 the Web sites on your appliance server using the tools on this Web page.

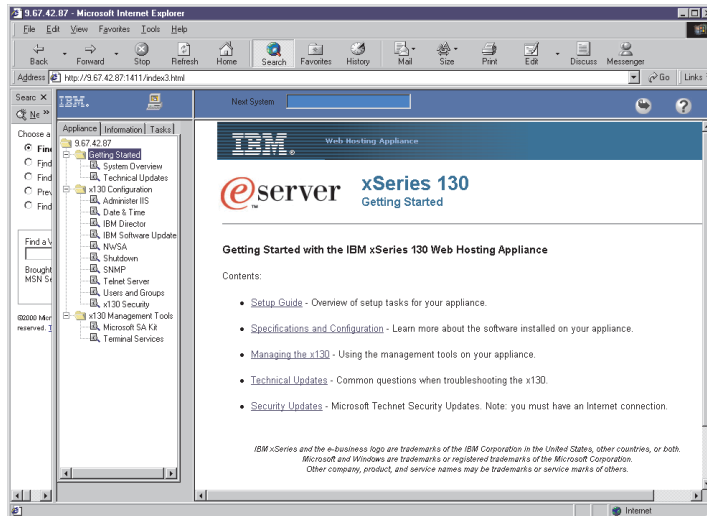


Figure 18. Viewing the xSeries 130 Web page

Your appliance server is now configured. You can use the features available from the Web page or other system management tools such as Windows Remote Terminal Services to manage your appliance server.

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 workstation 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 server 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 server 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 on the appliance server, 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. 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 Configuration/Setup Utility program for the xSeries 130

This section provides the instructions needed to start the Configuration/Setup Utility program. For more detailed information about these utility programs, see the *User's Reference* on the *Documentation CD*.

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. You can use this program to:

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

Attention: Your appliance ships 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:

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

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

To start the Configuration/Setup Utility program:

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.

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 xSeries 130 model 8654 only.

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

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.

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 37.
4. Create groups and determine if you want to enable reprovisioning (see “Using the group functions to manage your appliance servers” on page 42 and “Enabling Reprovisioning for an existing group” on page 49).
5. If necessary, add appliance servers to the groups (see “Moving an appliance server into a group” on page 47). 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 34 for more information.
7. You can now manage your appliance using UM Services or the Advanced Appliance Configuration Utility.

Installing and starting the Advanced Appliance Configuration Utility

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

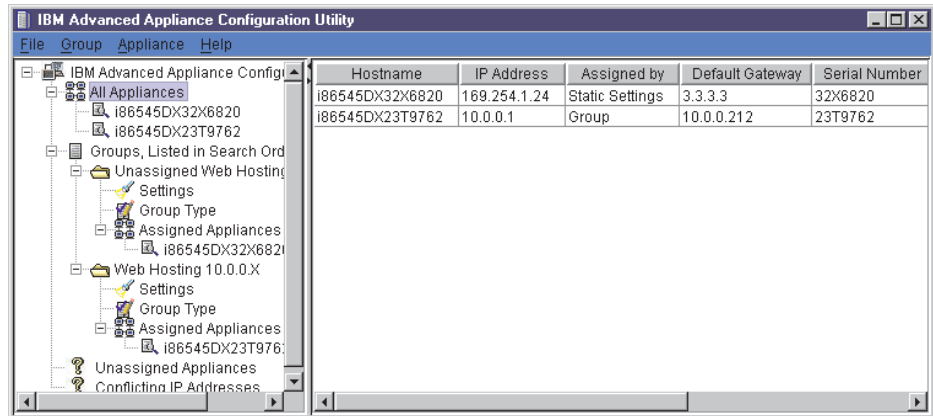
1. Insert the *Supplementary* CD into the CD ROM drive of your remote Windows workstation designated for managing the network.
2. Run the IAACConfig\setup.exe file, from the *Supplementary* CD to your remote workstation.
3. From the remote workstation you are using to manage the network, go to the Start 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 50) 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.

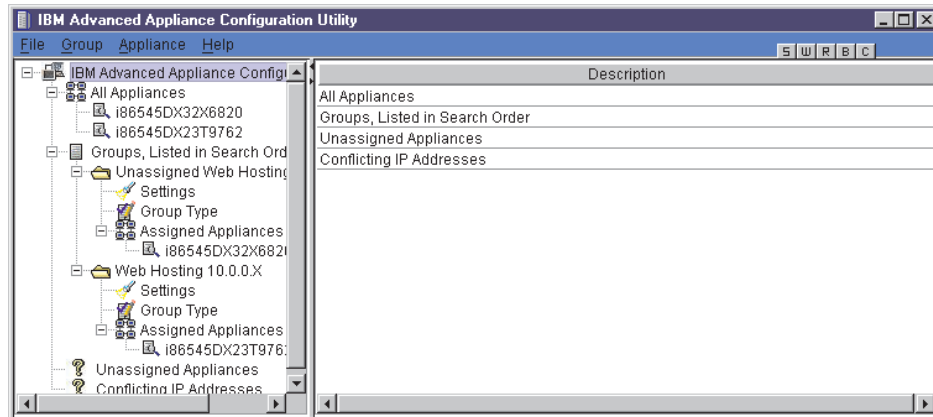
Using the group functions to manage your appliance servers

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 server. 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 server 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.

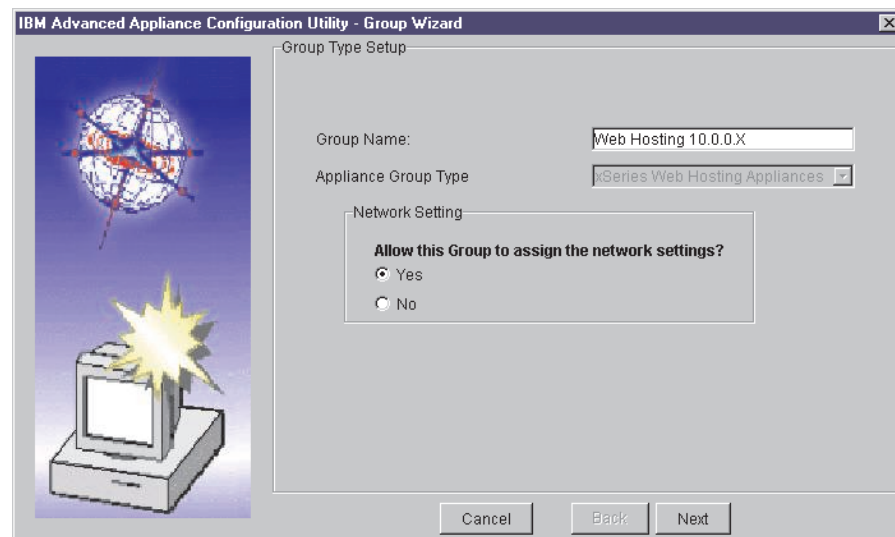
6. Click **Finish**.

When groups are defined, go to “Using the Assigned by First Matching Group function” on page 47 or “Moving an appliance server into a group” on page 47. 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 51). 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 48.

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 45.

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 48.

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

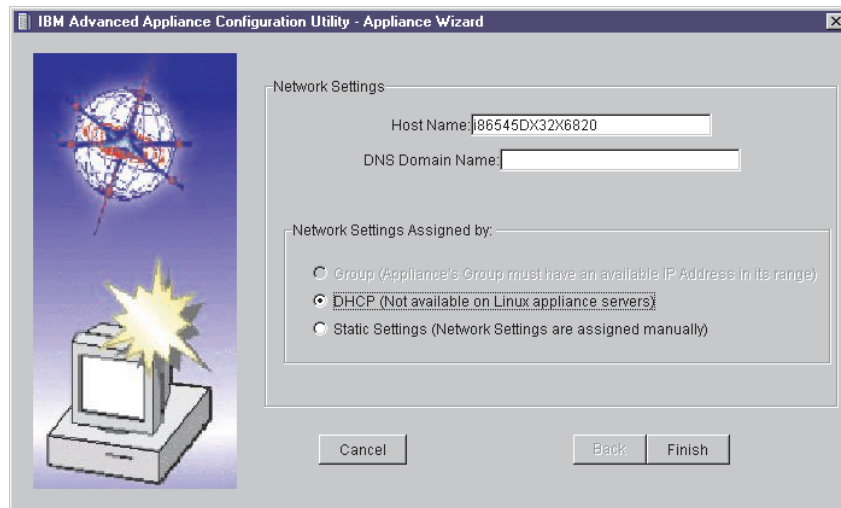
The Assigned by First Matching Group function enables you to set appliance servers to join the first matching group. You can move appliance servers to the group that you want by using a drag-and-drop method or by right-clicking the unassigned appliance server and then clicking **Assign by First Matching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

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.

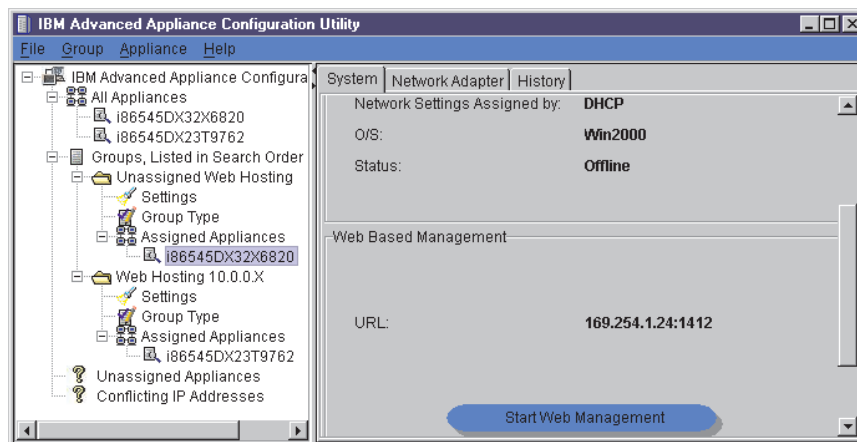
Notes:

- 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 33 or the *Universal Manageability Services User's Guide*, which is included on your *Documentation CD*.

Chapter 5. Solving problems

This section provides basic troubleshooting information to help you resolve some common problems that might occur with your 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 the "Solving problems" section in the *User's Reference* on the *IBM xSeries Documentation CD*.

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 beep code descriptions" on page 54.

- **Troubleshooting charts**

These charts list problem symptoms, and suggested steps to correct the problems. See the "Troubleshooting charts" on page 56 for more information.

- **Diagnostic programs and error messages**

The 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 server. See the "Solving problems" section in the *User's Reference* on the *Documentation CD* for more information.

- **Light Path Diagnostics™**

The Light Path Diagnostics feature is for identifying system errors on the xSeries 130 model 8654. For more information, see the "Solving problems" section in the *User's Reference* on the *Documentation CD*.

- **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>

POST beep code descriptions

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.

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 POST completes, call for service.

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.

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.

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.

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, or if no video appears, call for service.

POST beep codes

This section contains the POST beep codes for your appliance server. Your appliance server might emit 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 4. 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 server and then restart the server. If the problem persists, call for service.	
1-3-1	First 64 KB RAM test has failed. Turn off the server and then restart the server. If the problem persists, call for service.	
1-3-2	First 64 KB RAM parity test has failed. Turn off the server and then restart the 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 server and then restart the server. If the problem persists, call for service.	
3-3-2	I2C bus has failed.	

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 5. Troubleshooting charts.

Device	Suggested action
CD-ROM drive	Verify that:
CD-ROM drive is not recognized.	<ul style="list-style-type: none"> • The primary IDE channel is enabled in the Configuration/Setup Utility program. • All cables and jumpers are installed correctly. • The correct device driver is installed for the CD-ROM drive.
Diskette drive	If there is a diskette in the drive, verify that:
Diskette drive activity light stays on.	<ul style="list-style-type: none"> • The diskette drive is enabled in the Configuration/Setup Utility program. • The diskette is good and not damaged. (Try another diskette if you have one.) • Your software program is OK. <p>If the diskette drive activity light stays on, call for service.</p>
Intermittent problems	Verify that:
A problem occurs only occasionally and is difficult to detect.	<ul style="list-style-type: none"> • All cables and cords are connected securely to the rear of the server and attached options. • 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. • Ensure that the SCSI bus and devices are configured correctly and that the last external device in each SCSI chain is terminated correctly. <p>If the problem continues, call for service.</p>
Keyboard, mouse, or pointing-device problems.	<ul style="list-style-type: none"> • Make sure that the appliance server and the monitor are turned on. • Try using another keyboard.
All or some keys on the keyboard do not work.	<ul style="list-style-type: none"> • Make sure that the C2T device breakout cable is properly connected to a model 8654 appliance server. • Make sure that the keyboard cable is properly connected to the C2T breakout cable. <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"> • Verify that the mouse or pointing-device cable is securely connected and the device drivers are installed correctly. • Try using another mouse or pointing device. <p>If the problem continues, call for service.</p>

Table 5. Troubleshooting charts.

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

Table 5. 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>Notes:</p> <ul style="list-style-type: none"> • To prevent diskette drive read/ write errors, be sure that the distance between monitors and diskette drives is at least 76 mm (3 in.). • Non-IBM monitor cables might cause unpredictable problems. • 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. <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>Option problems</p>	<p>Verify that:</p>
<p>An IBM option that was just installed does not work.</p>	<ul style="list-style-type: none"> • 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. • You followed the installation instructions that came with the option. • The option is installed correctly. • You have not loosened any other installed options or cables. • You updated the configuration information in the Configuration/Setup Utility program. Whenever memory or an option is changed, you must update the configuration. <p>If the problem continues, call for service.</p>
<p>Power problems</p>	<p>Verify that:</p>
<p>The appliance server does not power on.</p>	<ul style="list-style-type: none"> • The power cables are properly connected to the appliance server. • The electrical outlet functions properly. • The type of memory installed is correct. • 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. <p>If the problem continues, call for service.</p>
<p>Serial port problems</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>Note: 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 5. Troubleshooting charts.

Device	Suggested action
A serial device does not work.	Verify that: <ol style="list-style-type: none"> 1. The device is compatible with the appliance server. 2. The serial port is enabled and is assigned a unique address. If the problem continues, call for service.
Software problem	To determine if problems are caused by the software, verify that:
Suspected software problem.	<ul style="list-style-type: none"> • Your appliance server has the minimum memory requirements to use the software. For memory requirements, see the information that comes with the software. <p>Note:</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"> • The software is designed to operate on your appliance server. • Other software works on your appliance server. • The software that you are using works on another system. <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>
Universal Serial Bus (USB) port problems	Verify that:
A USB device does not work.	<ul style="list-style-type: none"> • You are not trying to use a USB device during POST if you have a standard (non-USB) keyboard attached to the keyboard port. <p>Note: 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"> • The correct USB device driver is installed. • Your operating system supports USB devices. <p>If the problem continues, call for service.</p>

Appendix A. Product warranty and notices

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

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

Warranty period - Three years

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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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

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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

IBM power cord part number	Used in these countries and regions
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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