

IBM® xSeries 150



Installation Guide



IBM® xSeries 150



Installation Guide

NOTE

Before using this information and the product it supports, be sure to read the general information in “Appendix B. Product warranties and notices,” on page 39.

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Safety

Before installing this product, read the Safety Information book.

مج، يجب قراءة دات السلامة

Antes de instalar este produto, leia o Manual de Informações sobre Segurança.

安装本产品前请先阅读《安全信息》手册。

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs hæftet med sikkerhedsforskrifter, før du installerer dette produkt.

Lue Safety Information -kirjanen, ennen kuin asennat tämän tuotteen.

Avant de procéder à l'installation de ce produit, lisez le manuel Safety Information.

Vor Beginn der Installation die Broschüre mit Sicherheitshinweisen lesen.

Πριν εγκαταστήσετε αυτό το προϊόν, διαβάστε το εγχειρίδιο Safety Information.

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

Przed zainstalowaniem tego produktu należy przeczytać broszurę Informacje Dotyczące Bezpieczeństwa.

Prima di installare questo prodotto, leggere l'opuscolo contenente le informazioni sulla sicurezza.

本製品を導入する前に、安全情報資料を御読みてください。

이 제품을 설치하기 전에, 안전 정보 책자를 읽어보십시오.

Пред да го инсталирате овој производ прочитајте ја книгата со безбедносни информации.

Lees voordat u dit product installeert eerst het boekje met veiligheidsvoorschriften.

Les heftet om sikkerhetsinformasjon (Safety Information) før du installerer dette produktet.

Prije instalacije ovog proizvoda pročitajte priručnik sa sigurnosnim uputama.

Antes de instalar este produto, leia o folheto Informações sobre Segurança.

Перед установкой продукта прочтите брошюру по технике безопасности (Safety Information).

Pred inštaláciou tohto produktu si preítajte Informa nú brožúrku o bezpečnosti.

Preden namestite ta izdelek, preberite knjižico Varnostne informacije.

Antes de instalar este producto, lea la Información de Seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

在安裝本產品之前，也請先閱讀「安全性資訊」小冊子。

Installálás el tt olvassa el a Biztonsági el írások kézikönyvét !

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:

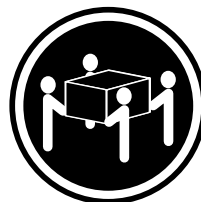
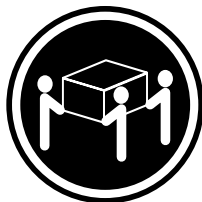
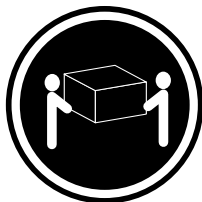
- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation 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 (37 lbs)

≥32 kg (70.5 lbs)

≥55 kg (121.2 lbs)

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.



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Chapter 1. Introduction

Thank you for purchasing an IBM® *@server* xSeries150 server. This *Installation Guide* provides the information that is needed to:

- Set up and cable your server
- Start and configure your server
- Connect to and manage your server

Packaged with the *Installation Guide* are software CDs that can be used to reload the network operating system (NOS), install additional software features, and install device drivers.

Also included is an *IBM xSeries Documentation CD*, which provides detailed information about your server.

Your server comes with a three-year limited warranty and 90-Day IBM Start Up Support. If you have access to the World Wide Web, you can obtain up-to-date information about your xSeries 150 model and other IBM server products at the following World Wide Web address:

<http://www.ibm.com/pc/us/netfinity/>

For a rack model, refer to the *Rack Installation Instructions* provided with your server for complete installation and removal instructions.

Record your product information in this table.

Product name	_____
Machine type	_____
Model number	_____
Serial number	_____
Key serial number	(tower model only) _____
Key manufacturer	(tower model only) _____
Key phone number	(tower model only) _____

The server serial number is located on labels on the rear of the server and on the front of the server below the bezel.

Note: Your server keys cannot be duplicated by locksmiths. If you lose them, order replacement keys from the key manufacturer. The key serial number and phone number of the manufacturer are on a tag attached to the keys.

Features and specifications

Table 1 provides a summary of the features and specifications for your xSeries 150 server.

Table 1. Features and Specifications

<p>Microprocessor:</p> <ul style="list-style-type: none"> • 1 or 2 Intel® Pentium® III microprocessors with MMX™ technology and SIMD extensions, depending on model • 256 KB Level-2 cache (min.) • Supports up to two microprocessors <p>Memory:</p> <ul style="list-style-type: none"> • Standard: 256 MB or 1 GB, depending on model • Maximum: 4 GB • Type: 133 MHz, ECC, SDRAM, Registered DIMMs • Slots: 4 dual inline slots <p>Drives standard:</p> <ul style="list-style-type: none"> • 3 or 6 Hard Disk Drives, depending on model • Diskette: 1.44 MB • CD-ROM: 40X IDE <p>Expansion bays:</p> <ul style="list-style-type: none"> • Hot-swap: six slim high or three half high • Non-hot-swap: Three 5.25-inch (one used by CD-ROM drive) <p>PCI expansion slots:</p> <ul style="list-style-type: none"> • Three 33 MHz/64-bit • Two 33 MHz/32-bit <p>Power supplies:</p> <p>250 watt (115-230 Vac)</p> <ul style="list-style-type: none"> • Standard: One • Maximum: Three, only with optional power backplane that enables multiple power supplies and hot-swappability 	<p>Video:</p> <ul style="list-style-type: none"> • S3 video controller (integrated on system board) • Compatible with SVGA and VGA • 8 MB SDRAM video memory <p>Size (Rack Model 5U)</p> <ul style="list-style-type: none"> • Height: 220 mm (8.7 in.) • Depth: 630 mm (24.8 in.) • Width: 440 mm (17.3 in.) • Weight: approximately 35.38 Kg (78 lb.) when fully configured <p>Size (Tower Model)</p> <ul style="list-style-type: none"> • Height: 440 mm (17.3 in.) • Depth: 660 mm (26.0 in.) • Width: 220 mm (8.7 in.) • Weight: approximately 36.74 Kg (81 lb.) when fully configured <p>Integrated functions:</p> <ul style="list-style-type: none"> • Netfinity Advanced System Management processor • ServeRAID 4L/4H PCI adapter • Dual channel Ultra3 SCSI controller • One integrated 10BASE-T/100BASE-TX AMD Ethernet controller • 1 or 3 Netfinity 10/100 Ethernet Adapter 2s, depending on model • Two serial ports • One parallel port • Two Universal Serial Bus (USB) ports • Keyboard port • Mouse port • Video port <p>Acoustical noise emissions:</p> <ul style="list-style-type: none"> • Sound power, idling: 6.0 bel maximum • Sound power, operating: 6.0 bel maximum • Sound pressure, operating: 45 dBa 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: 683 BTU (200 watts) • Maximum configuration: 2048 BTU (600 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: 0.52 kVA
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Notices used in this book

This information product contains notices that relate to a specific topic. The Caution and Danger notices also appear in the multilingual safety booklet that came with your xSeries product. Each notice is numbered for easy reference to the corresponding notices in the safety booklet.

The notice definitions are as follows:

- **Notes:** These notices provide important tips, guidance, or advice.
- **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 notices indicate situations that can be potentially hazardous to you. A caution notice is placed just before descriptions of potentially hazardous procedure steps or situations.
- **Danger:** These notices indicate situations that can be potentially lethal or extremely hazardous to you. A danger notice is placed just before descriptions of potentially lethal or extremely hazardous procedure steps or situations.

Chapter 2. Cabling the server

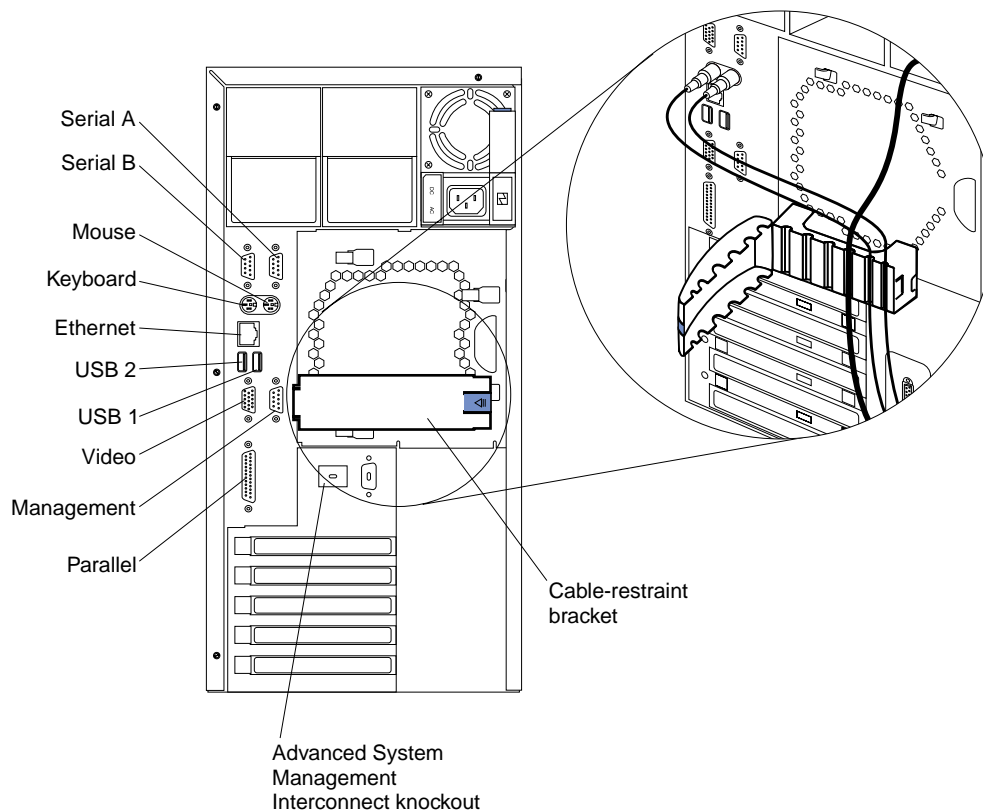
When you cable the server, be sure to route the power cable through the cable-restraint bracket on the rear of the server. Because your xSeries 150 is a "headless" server, you will not need to connect a mouse or keyboard cable when cabling your server. You will only need to connect the power cable and network cables.

Before cabling the server, you must first unpack the appliance server and place it in the location where it will be installed or, if you are installing a rack-mounted model, install the appliance server in a rack. For more information on how to install a rack-mounted server in a rack, see "Appendix A. Rack Installation Instructions," on page 35.

Notes:

1. If you plan to use the IBM Advanced Appliance Configuration Utility to configure and manage your appliance, be sure to connect the built-in Ethernet connector to the same physical network as your systems management console.
2. The illustrations in this document might differ slightly from your hardware.

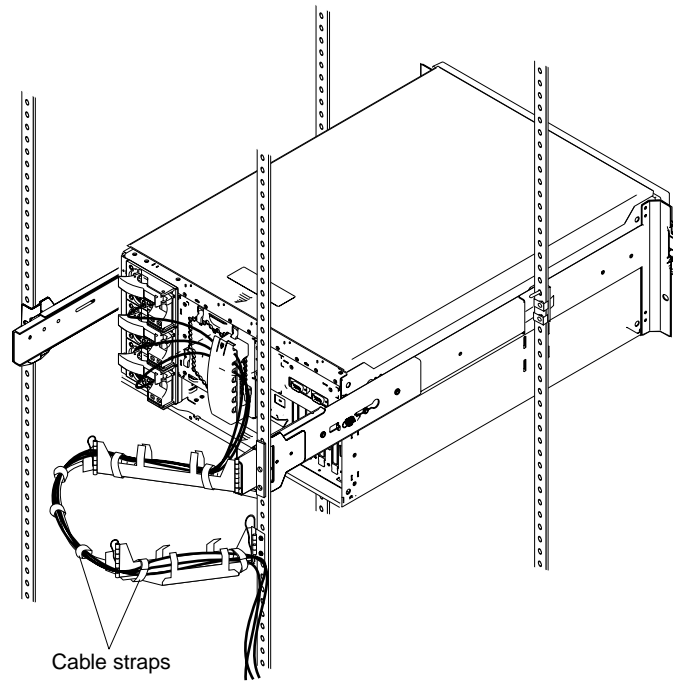
Cabling the rear of the server



Note: The Management connector is dedicated for use by the Advanced System Management processor.

Additionally, for rack models, be sure to route all the cables through the cable-management assembly on the rack (see the following illustration).

Routing cables through cable-management assembly



For more information on installing your xSeries 150 in a rack, see “Appendix A. Rack Installation Instructions,” on page 35.

Chapter 3. Starting the server

After you plug the power cord of your server into the power supply and an electrical outlet, the server can start in several ways:

- You can press the Power control button on the front of the server to start the server.
Note: After you plug the power cord of your server into an electrical outlet, wait approximately 20 seconds before pressing the Power control button. During this time, the system-management processor is initializing and the Power Control button does not respond.
- If the server is turned on, a power failure occurs, and unattended-start mode is enabled in the Configuration/Setup utility program, the server will start automatically when power is restored.
- If AC power is present, the server is off, and the wake-up feature is enabled in the Configuration/Setup utility program, the wake-up feature will turn on the server at the set time.
- If AC power is present, the server is off, and ring signal detect is enabled in the Configuration/Setup utility program, you can turn on the server by telephone input.
- The Netfinity Advanced System Management Processor also can turn on the server.

Important

The first time you start your server, a series of configuration and system preparation programs that finish configuring the NOS are run automatically. These programs must finish running before you use any included applications (such as the IBM Advanced Appliance Configuration Utility or the Terminal Services Client) to connect to or configure your xSeries 150. Do not connect to or configure the xSeries 150 for at least 15 minutes after the initial system start. This notice applies only to the first time the xSeries 150 is started.

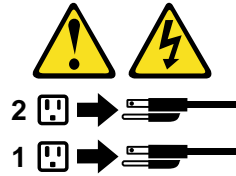
Statement 5



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 5



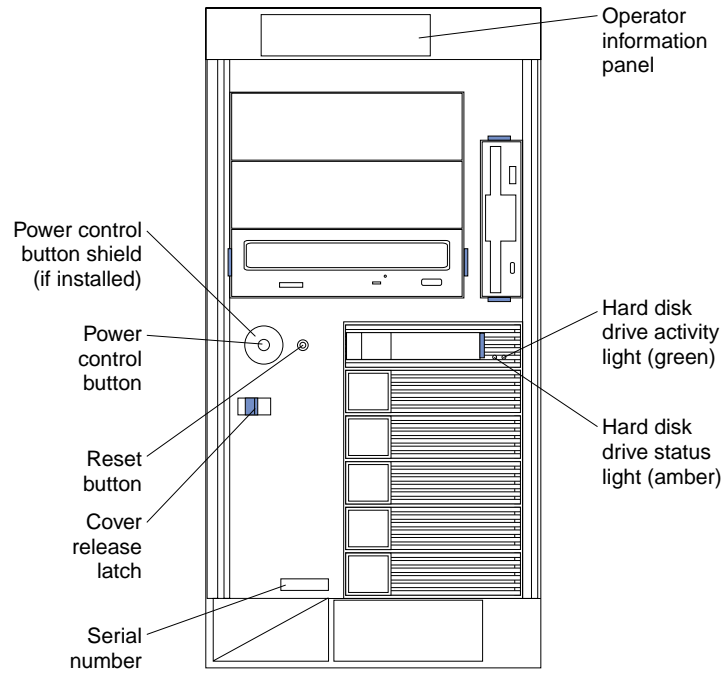
You can turn off the server as follows:

- You can press the Power control button on the front of the server. This starts an orderly shutdown of the operating system, if this feature is supported by your operating system, and places the server in standby mode.
Note: After turning off the server, wait at least 5 seconds before you press the Power control button to power the server on again.
- You can press and hold the Power control button for more than 4 seconds to cause an immediate shutdown of the server and place the server in standby mode. You can use this feature if the operating system ceases to function.
- You can disconnect the server power cords from the electrical outlets to shut off all power to the server.
Note: Wait about 15 seconds after disconnecting the power cords for your system to stop running. Watch for the Power-on light on the operator information panel to stop blinking.

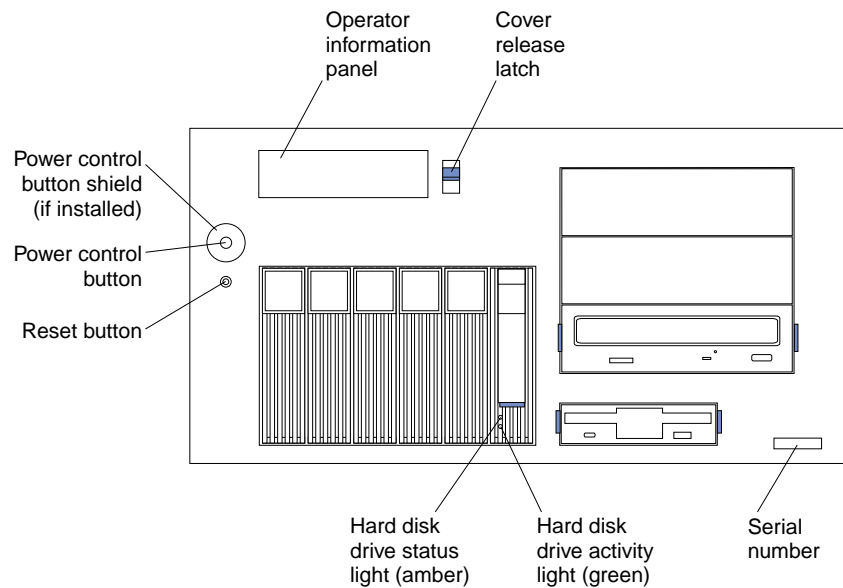
Controls and indicators

The following illustrations show the controls and indicators on the front of the server.

Tower model



Rack model



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

Power control button shield: You can install this circular disk over the power control button to prevent accidental manual power-off. This disk is provided with your server.

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

Operator information panel: The lights on this panel give status information for your server.

Cover release latch: Slide this lever to release the cover.

Serial number: This number uniquely identifies your server.

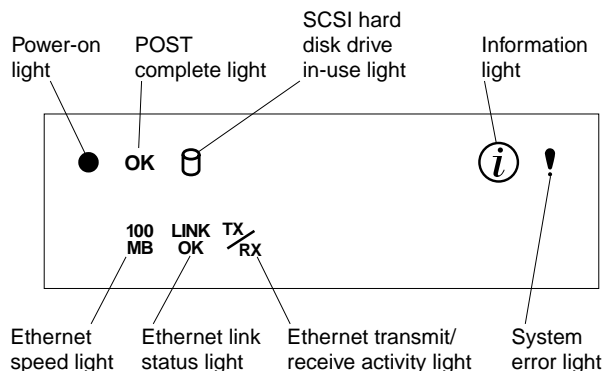
Hard disk drive status light: Each of the hot-swap drives has a hard disk drive status light. When this amber light is on continuously, the drive has failed.

Hard disk drive activity light: Each of the hot-swap drives has a hard disk drive activity light. When this green light is flashing, the controller is accessing the drive.

If a ServeRAID adapter is installed and this light flashes slowly (one flash per second), the drive is being rebuilt. When the light flashes rapidly (three flashes per second), the controller is identifying the drive.

Operator information panel

The following illustration shows the location of the status lights on the operator information panel on the front of the server (see “Controls and indicators” on page 9).



Power-on light

This green LED lights when system power is present in the server. When this light flashes, the server is in standby mode (the system power supply is turned off and AC current is present). If this light is not on, the power cord is not connected, the power supply has failed, or this LED has failed.

POST complete light

This green LED lights when the server completes the power-on self-test (POST) without any errors.

SCSI hard disk drive in-use light

This green LED lights when there is activity on a hard disk drive.

Information light

This amber LED lights when the information log contains information about certain conditions in your server that might affect performance. For example, the light will be on if your server has multiple power supplies and does not have redundant power. An LED on the diagnostic panel on the system board will also be on.

System error light

This amber LED lights when a system error occurs. An LED on the diagnostic panel on the system board will also be on to further isolate the error. Refer to the "Problem solving" section of the *User's Reference* on the *IBM xSeries Documentation* CD for detailed information on using the diagnostic panel (light path diagnostics).

Ethernet speed light

This green LED lights when the Ethernet LAN speed is 100 Mbps.

Ethernet link status light

This green LED lights when there is an active connection on the Ethernet port.

Ethernet transmit/receive activity light

This green LED lights when there is transmit or receive activity to or from the server.

Chapter 4. Appliance Configuration Programs

Your xSeries appliance server comes with programs that can be used to configure, manage, and maintain your appliance server. These configuration programs include:

- **Universal Manageability Services**

Universal Manageability Services (UM Services) provides point-to-point remote management of client systems through a Web browser window. Use UM Services to:

- Learn detailed inventory information about your computers, including operating system, memory, network cards and hardware.
- Track your computers proactively with features such as power management, event log, and system monitor capabilities.
- Upwardly integrate with Tivoli Enterprise, Tivoli NetView, Computer Associates Unicenter, Microsoft SMS, and Intel LANDesk Management Suite.

- **IBM Advanced Appliance Configuration Utility**

The Advanced Appliance Configuration Utility aids in setting up and reconfiguring the network configuration on your appliance servers. The Advanced Appliance Configuration Utility agent, preinstalled on your IBM xSeries appliance, works with the Advanced Appliance Configuration Utility console to automatically detect the presence of appliances on the network. Once the appliance server is detected by the Advanced Appliance Configuration Utility console, use the Advanced Appliance Configuration Utility to set up and manage the appliance's network configuration, including assigning the IP address, default gateway, network mask, and DNS server to be used by the appliance. You can also use the Advanced Appliance Configuration Utility to start UM Services on the appliance, enabling you to perform more advanced systems management tasks.

- **Terminal Services Client**

Because your xSeries appliance server is installed in a "headless" environment (meaning that the appliance does not have a mouse or keyboard attached to it), you must perform systems management tasks on the appliance from a remote systems management console. The Terminal Services Client, when installed on a workstation that is attached to the same network as the appliance server, enables remote administration of the appliance.

Information about each of these appliance configuration programs follows.

Universal Manageability Services

Universal Manageability Services (UM Services) is a suite of graphical user interfaces (GUIs) that enhances the local or remote administration, monitoring, and maintenance of IBM systems. UM Services is a lightweight client that resides on each managed computer system. With UM Services, a client-system user or remote systems administrator can use a supported Web browser or the Microsoft Management Console (MMC) and UM Services Web console support to inventory, monitor, and troubleshoot IBM systems on which UM Services is installed.

This "point-to-point" systems-management approach, in which a system-management administrator uses a Web browser to connect directly to a remote client system, can be

used to enhance support and to enable systems administrators to effectively maintain IBM systems without requiring them to install additional systems-management software on their administrator console.

In addition to point-to-point systems-management support, UM Services also includes support for UM Services Upward Integration Modules (Aims). Aims enable systems-management professionals who use any supported systems-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. Because it was designed to use industry-standard information gathering technologies and messaging protocols (including Common Information Model (CIM), Desktop Management Interface (DMI), and Simple Network Management Protocol (SNMP), UM Services adds value to any of these supported workgroup or enterprise system-management platforms.

Complete documentation on how to use UM Services is included on the *IBM xSeries 150 Documentation CD*.

System Requirements

The UM Services client is preinstalled on your xSeries appliance server. However, you must have a supported web browser installed on your systems management console. Supported browsers include:

- Microsoft Internet Explorer 4.01 or later

Notes:

1. If you are using Internet Explorer 5.x, you must install the optional Java Virtual Machine (VM) support to access a client system running UM Services.
2. If you are using Internet Explorer and you reinstall Internet Explorer after installing UM Services you must reapply the Microsoft VM update. The UM Services client requires Microsoft VM Build 3165 or later. Download the latest Microsoft VM from

<http://www.microsoft.com/java>

- Netscape Navigator or Netscape Communicator 4.5 or later
- Microsoft Management Console (MMC) 1.1 or later

Note: If you install UM Services before you install MMC 1.1 or later you will not have an icon for Microsoft Management Console in the IBM Universal Manageability Services section of your Start Menu.

Starting UM Services

Before you can use UM Services, you must configure the network settings (such as IP address, subnet mask, and so forth) on your xSeries appliance server. You can use IBM Advanced Appliance Configuration Utility or Windows Terminal Services Client to configure the network setting remotely, or you can attach a keyboard and mouse to your appliance server and configure the Network settings using the Windows Control Panel. Once you have configured the network settings for your appliance, you are ready to use UM Services.

To start UM Services:

1. Start your web browser and then type in the **Address** or **Location** field of the browser

`http://ip_address:1411`

where *ip_address* is IP address of the appliance server, and then press **Enter**.

Or, type

http://ibm-xxxxxxx:1411

where xxxxxxx is the IBM serial number of the appliance, and then **Enter**.

2. A user login window appears. Type Administrator in the Username field, and type password for the Password field. You can leave domain blank. Make sure the "Save this password in your password list" checkbox is not checked, and then click **OK**.

Note: The first time you connect you may be prompted to install XML and Swing components. Follow the on-screen instructions to install these components, then close and restart Internet Explorer before you proceed.

3. You are now connected to the appliance via UMS. Complete documentation on how to use UM Services is included on the *IBM xSeries 150 Documentation CD*. In addition to the standard UM Services functionality, your xSeries appliance includes additional functionality, available from the Appliances tab in the UM Services console. The default view when you connect to your appliance the Terminal Services panel, which displays a Windows 2000 Terminal Services Web Connection page. To connect to the appliance to manage it as though you were running Terminal Services Client from your desktop:
 - a. Type in the IP address field the IP Address of the server (seen in upper left hand corner of left UMS panel), or enter IBM-{xxxxxxx} (where xxxxxxx is the serial number that appears on the front of the appliance).
 - b. Choose a size other than full screen which the Appliance desktop will appear in, then click **Connect** to start the Terminal Services Client session on the appliance. A user login widow appears.
 - c. Log into the appliance. Type Administrator in the Username field, type password in the password field, and then click OK to log in. Once you have logged in, you can begin using Terminal Services Client to configure and manage your appliance.

Note: To ensure system security, use Windows Powered to change the Administrator password from "password" to something else. Once you do, or if you create another user in the Administrator group in the future, use your new username/password combination instead of the default username/password combination.

IBM Advanced Appliance Configuration Utility

The IBM Advanced Appliance Configuration Utility aids in setting up and reconfiguring the network configuration on your xSeries appliance servers. The Advanced Appliance Configuration Utility agent, preinstalled on your IBM xSeries appliance, works with the Advanced Appliance Configuration Utility console, a Java-based application that is installed on a network-attached system that will be used as a systems management console that enables you to automatically detect the presence of xSeries appliances on the network. Once the xSeries appliance is detected by the Advanced Appliance Configuration Utility console, use the Advanced Appliance Configuration Utility to set up and manage the appliance's network configuration, including assigning the IP address, default gateway, network mask, and DNS server to be used by the appliance. You can also use the Advanced Appliance Configuration Utility to start *Universal Manageability Services (UM Services)* on the appliance, enabling you to perform more advanced systems management tasks.

Networks that are not currently running DHCP servers will find the Advanced Appliance Configuration Utility particularly useful for automatically configuring network settings for newly added appliance servers. However, networks with DHCP servers will benefit from using the Advanced Appliance Configuration Utility as it enables the systems administrator to reserve and assign the appliance IP address in an

orderly, automated fashion. Even if the customer decides to use DHCP and does not choose to reserve an IP address for the appliance, the Advanced Appliance Configuration Utility can still be used to discover appliances and to start UM Services web-based systems management.

Notes:

1. The Advanced Appliance Configuration configures and reports the TCP/IP settings of the first adapter on each appliance server only. The first adapter is typically the built-in Ethernet controller. Be sure to connect the built-in Ethernet connector to the same physical network as your systems management console.
2. The Advanced Appliance Configuration Utility must be running to configure newly installed appliance servers automatically.
3. The system running the Advanced Appliance Configuration Utility console automatically maintains a copy of its database (ServerConfiguration.dat) in the Advanced Appliance Configuration Station installation directory. To remove previous configuration data, close the Advanced Appliance Configuration Utility, delete this file, and then restart the utility. This deletes all previously configured Families. However, the Advanced Appliance Configuration Utility will discover connected xSeries appliances and their network settings.

The Advanced Appliance Configuration Utility Agent

Once your appliance is connected to your network, the Advanced Appliance Configuration Utility agent automatically reports the appliance's MAC address (of the first NIC only), serial number, type of appliance, and whether DHCP is in use by the appliance or not. Furthermore, it will report the hostname, primary IP address, subnet mask, primary DNS address, and primary gateway address if these are configured on the system.

The Advanced Appliance Configuration Utility agent is preinstalled on your xSeries appliance.

Note: The Advanced Appliance Configuration Utility agent periodically broadcasts the appliance server IP settings. To prevent the service from broadcasting this data periodically, stop the `iaaconfig` service.

The Advanced Appliance Configuration Utility Console

The Advanced Appliance Configuration Utility Console is a Java application that you install on one system in your network that will be used as a systems management console. For information on how to install the Advanced Appliance Configuration Utility Console, see "Using the Supplementary CD" on page 26.

Note: Do not install the Advanced Appliance Configuration Utility Console on more than one systems management console.

The Advanced Appliance Configuration Utility Console enables you to:

- Automatically discover xSeries appliance servers that run the Advanced Appliance Configuration Utility agent and are attached to the same physical subnet as the Advanced Appliance Configuration Utility Console.
When you start the Advanced Appliance Configuration Utility Console it automatically detects all appliance servers on your physical subnet that are running the Advanced Appliance Configuration Utility agent.
- Use a simple, GUI-based application to configure the appliance servers network settings.

Use the Advanced Appliance Configuration Utility to assign IP addresses, DNS and gateway server addresses, subnet masks, hostnames, and more.

- Automatically group discovered appliances into function-specific Families. Appliances are added to a Family based on the appliance type. Appliances running different operating systems, but which perform the same function, appear in the same Family.
- Start UM Services web-based systems management console.
Launch UM Services on your appliance servers and perform advanced systems management tasks on a selected appliance server with a single mouse click.

The Advanced Appliance Configuration Utility Console is divided into two panes:

- **The Tree View Pane**
The Tree View Pane, located on the left side of the Advanced Appliance Configuration Utility Console window, presents a list of all discovered xSeries appliances and includes any Families you have previously defined. The Tree View Pane also includes groups for appliances that do not fit any of the defined Families, that were not configured using the Advanced Appliance Configuration Utility, or that have IP addresses that conflict with other devices on your network. When you click on any item in the Tree View information about that item (and any items which are nested below that item in the tree view) information about the selected item appears in the Information Pane.
- **The Information Pane**
The Information Pane, located at the right side of the Advanced Appliance Configuration Utility Console, displays information about the item that is currently selected in the Tree View Pane. The information that appears in the Information Pane varies depending on the item that is selected. For example, if you select the All Appliances item from the Tree View Pane, the Information Pane displays configuration information (IP settings, hostname, serial number, and so forth) about all of the xSeries appliances that have been discovered by the Advanced Appliance Configuration Utility Console. However, if you select a Family, the Information Pane displays information about the Family settings for the selected Family.

The Advanced Appliance Configuration Utility Console also features the following menus:

- **File**
Use the selections available from the File menu to import or export the Advanced Appliance Configuration Utility Console configuration data, to rescan the network, or to exit the program.
- **Family** Use the selections available from the Family menu to add or delete Families, or to move Families up or down in the tree view.
- **Appliance** Use the selections available from the Appliance menu to remove a previously discovered appliance from a Family or group, and to add an appliance to the first matching Family in the tree view.
- **Help**
Use the Help menu to display product information.

Discovering xSeries Appliances

Any xSeries appliance server that is running and is connected to the same subnet as the system running the Advanced Appliance Configuration Utility console is automatically discovered when you start the Advanced Appliance Configuration Utility console. Discovered appliances appear in the Advanced Appliance Configuration Utility console tree view (found in the left pane of the Advanced Appliance Configuration Utility console window). Each appliance will appear in two locations in the tree view:

1. Every discovered appliance is listed in the tree view under All Appliances.
2. Each discovered appliance will also appear in one of the following portions of the tree view:
 - In a *Family*

If the discovered appliance fits the requirements of a Family, it will automatically appear as part of a Family.

Note: If a discovered appliance fits the requirements of more than one Family, it is automatically added to the first appropriate Family that is listed in the tree view, starting from the top of the tree. For information on how to move appliances between families, see “Using Families and Groups in the Tree View”.
 - In the *Orphaned Appliances* group

If the discovered appliance does not fit a previously configured Family, it is placed in the *Orphaned Appliances* group.
 - In the *Orphaned Externally Configured Appliances* group

Appliances that are running the Advanced Appliance Configuration Utility agent, but that have a network configuration that was not set by the Advanced Appliance Configuration Utility agent or console, will appear in the *Orphaned Externally Configured Appliances* group. If an appliance is contained in the Orphaned Externally Configured Appliances group you can use the Adopt By First Matching Family function to add it to a previously defined Family. For more information, see “Using the Adopt by First Matching Family Function” on page 21.

Using Families and Groups in the Tree View

Families are important elements of the Advanced Appliance Configuration Utility. They specify the parameters the Advanced Appliance Configuration Utility uses to automatically categorize discovered appliances and to configure them with the appropriate network settings. Family rules are defined solely by appliance type or purpose. Each Family can contain only one type of appliance. The only way to automatically apply predetermined network settings to newly installed and discovered appliance servers is to create and use Families.

Appliance servers that match the rules criteria for a Family group can be automatically configured to use predefined network settings. A Family can be configured to allow appliances to use DHCP to configure their IP settings, or can be defined to automatically assign IP settings (such as primary gateway and DNS server addresses, assigning an IP address from a specified IP address range, and specifying a subnet mask). Host names for discovered appliances can also be defined so that they are allocated using either a Prefix or Serial Number.

The Advanced Appliance Configuration Utility is not the only way to configure network settings. For example, network settings can be configured using Terminal Services for Windows or by attaching a keyboard and mouse to the appliance and using Windows Control Panel on the server. If the appliance network settings have been configured by a method other than using the Advanced Appliance Configuration Utility the appliance will be discovered by the Advanced Appliance Configuration Utility and it will be added to an appropriate Family, if one exists. Appliances that have been configured using a method other than the Advanced Appliance Configuration Utility for which no appropriate family exists will appear in the Orphaned Externally Configured Appliances group.

The Tree View Panel contains the following items:

- All Appliances Every discovered appliance is listed in the tree view under All Appliances.

- Families

The Families group in the Tree View Pane shows all Families that have been defined, with appliance servers that have already been assigned to each Family nested beneath the Family name in the tree view. Families are defined by appliance purpose so all appliances that appear in a given family are of the same type. If you select a Family from the Tree View Pane a description of the Family and the rules that are used to define the selected Family are displayed in the Information Pane. If you select an appliance server from a Family in the Tree View Pane, the selected appliance network settings are displayed in the Information Pane.

If you are not using DHCP, the Advanced Appliance Configuration Utility automatically assigns one IP address per appliance server, using available addresses within the range defined in the Family rules. When a Family's IP address range has been exhausted, the Advanced Appliance Configuration Utility automatically searches for other Families that have rules matching the appliance server being configured. If a matching Family with an available address is found, the server will automatically be assigned to the Family that has available IP addresses. This enables you to define multiple Families, each of which uses a range of non-contiguous IP address ranges.

When an appliance is discovered on the network, the Advanced Appliance Configuration Utility automatically searches all previously defined Families, starting with the first Family listed in the Families tree view and moving downward. Appliances are automatically added to the first defined Family that matches the appliance purpose. Therefore, the order in which Families appear is important. To adjust this search order, right click on a Family and then select Move Up or Move Down to adjust its position within the Families list.

- Orphaned Appliances

Any discovered appliance servers that have been configured using the Advanced Appliance Configuration Utility but that do not meet the rules for any existing Family are automatically added to the Orphaned Appliances group.

- Orphaned Externally Configured Appliances

Any discovered appliance server that has been configured without using the Advanced Appliance Configuration Utility tool and that does not meet the rules for any existing Family is automatically added to the Orphaned Externally Configured Appliances group. Appliance servers configured without the Advanced Appliance Configuration Utility that meet the rules for any existing Family are automatically added to the matching Family. To add an Orphaned Externally configured Appliance to an appropriate Family that was created after the orphaned appliance was discovered, right-click on the orphaned appliance and select **Adopt by First Matching Family**. For more information, see "Using the Adopt by First Matching Family Function" on page 21.

Note: The Advanced Appliance Configuration Utility will not change manually configured network settings of discovered appliance servers. If the manually configured IP and Subnet addresses fit an existing Family, the Advanced Appliance Configuration Utility will place that appliance server into that Family, but will not change any other settings (such as Host Name or DNS or Gateway addresses).

- Conflicting Network Addresses

Any discovered appliance server that has the same IP address as a previously discovered appliance server will be listed in the Conflicting Network Addresses group.

Creating a Family: To create a Family:

1. Select **Create Family** from the Family menu.

The Advanced Appliance Configuration Utility Family Setup window appears.

2. Select the Appliance Family Rules.

The Appliance Family Rules determine what purpose an appliance must serve to be included in the Family. You can select one of the following values:

- IBM xSeries 150
- IBM xSeries 130 and 135

3. Specify a Family name.

Type in the Family Name field that name that will be used for this Family.

4. Specify network resources to be used by members of the Family.

You can use the Advanced Appliance Configuration Utility to assign network resources for members of this Family, to you can use a DHCP server to assign network resources.

- To use the Advanced Appliance Configuration Utility to assign network resources, uncheck the **Use DHCP** checkbox and fill in the following fields:

Min IP Address

The lowest IP address in a range of IP addresses that can be assigned to an appliance that is a member of this Family

Max IP Address

The highest IP address in a range of IP addresses that can be assigned to an appliance that is a member of this Family

Subnet Mask The subnet mask value that will be used by appliances that are members of this Family

Default Gateway

The IP address of the default gateway that will be used by appliances that are members of this Family (optional)

DNS The IP address of the Domain Name Server that will be used by appliances that are members of this Family (optional)

- To use a DHCP server to assign network resources, check the **Use DHCP** checkbox. This will allow a DHCP server on your network to assign an IP address and subnet mask and to specify the default gateway address and address of the Domain Name Server that will be used by appliances that are members of this Family.

5. Select a Host Name Allocation Type.

The Host Name Allocation Type enables you to automatically specify a specific Host Name that members of this Family will use. You can select one of the following Host Name Allocation Types:

No Allocation

No preconfigured host name format will be assigned to appliances that are members of this family.

Use Serial Number

The Serial Number of the discovered appliance will be used as a host name for the appliance.

Use Prefix Name

A user-specified prefix, along with an incremental number for each appliance, will be used for the host name of each appliance that is a member of this Family. Type the desired prefix in the **Host Name Prefix** field.

6. Click **OK** to save this Family.

Removing Appliances from Families: Use the Remove Appliance to delete an appliance from the Advanced Appliance Configuration Utility console database. Removing an appliance that is no longer in use allows the IP address that was assigned to the appliance to be allocated to another appliance. You can also removing an appliance from a family and then Rescan the network to add it to an appropriate Family that appears higher in the Tree View pane.

To remove an appliance, right-click on the appliance, and then select Remove Appliance from the pop-up menu.

- If the Advanced Appliance Configuration Utility is unable to communicate with the selected appliance (because, for example, it has been removed from the network or has failed) the appliance is removed immediately.
- If the Advanced Appliance Configuration Utility is able to communicate with the selected appliance you will be asked to confirm removal of the appliance before the appliance removal task is completed. This helps prevent accidental removal of an active and functional appliance.

Using the Adopt by First Matching Family Function: Use the Adopt by First Matching Family function to:

- Add an *Orphaned Externally Configured Appliance* to an appropriate Family.
Appliances that have been configured without using the Advanced Appliance Configuration Utility tool and that do not meet the rules for any existing Family are automatically added to the Orphaned Externally Configured Appliances group. If, after the orphaned appliance is discovered, you create a Family that is appropriate for the orphaned appliance, right-click on the orphaned appliance and select **Adopt by First Matching Family** to move the appliance from the Orphaned Externally Configured Appliances group to the newly created Family.
- Move an appliance from one Family to another appropriate Family that occurs higher in the list of previously defined Families. If there is more than one appropriate Family for a newly discovered appliance, it automatically appears in the first appropriate Family in the list of Families. If you want to move a discovered appliance from one appropriate Family to another appropriate Family:
 1. Right-click on the Family that you want the appliance moved to.
 2. Select Move Up in List to move the selected Family up in the list of families. Repeat steps 1 and 2 until the Family that you want to add the appliance to appears above the Family that currently contains the appliance.
 3. Right-click on the appliance that you want to move to another Family and then select **Adopt by First Matching Family**.

Launching UM Services

You can use the Advanced Appliance Configuration Utility to quickly and easily launch UM Services on your xSeries appliances.

Note: The selected appliance server must be running Universal Manageability (UM) Services as a UM Services client. Also, the systems management console (the system that is running the Advanced Appliance Configuration Utility Console) must use a web browser that is supported for use with UM Services, and if you have never used UM Services from this system previously you will need to install several plug-ins before proceeding. If you are using an unsupported browser, or if your browser does not have the necessary plug-ins, you will be notified when you attempt to launch UM Services on the appliance. For more information on UM Services, see the following web site:

<http://www.pc.ibm.com/ww/software/applications/ums/library.html>

To use the Advanced Appliance Configuration Utility Console to start UM Services on an appliance:

1. Click on the appliance in the Advanced Appliance Configuration Utility Console Tree View Pane.

When you select the appliance from the tree view information about the selected appliance appears in the Information Pane. A **Start Web-Based Management** button appears as well.

2. Click **Start Web-Based Management**.

Your default web browser starts, loading the UM Services console automatically.

3. Log on to the UM Services console. Refer to step 2 on page 15 for proper login instruction.

For more information on using UM Services to manage your appliances, see the *Universal Manageability Services User's Guide*, included on your *IBM xSeries 150 Documentation CD*.

Terminal Services Client

To install the Terminal Services Client on the remote workstation and connect to your xSeries appliance server:

1. Insert the *Supplementary CD* into the workstation CD-ROM drive.
2. Click **Start-> Run**.
3. In the **Open** field, type (with quotes)

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

where *x* is the drive letter assigned to the CD-ROM drive. Then click **OK** to begin the Terminal Services Client Setup program.

4. Accept the defaults in each window that opens or refer to the Microsoft Windows documentation for more instructions. When the Terminal Services Client Setup program is completed proceed to the next step.
5. Check the workstation network TCP/IP protocol configuration settings.

The IP address used by the workstation must be obtained automatically. If the network interface card for the workstation is configured to obtain an IP address automatically you can proceed to the next step. However, if the network interface card for the workstation is configured to use a static IP address you must set the IP Address and Subnet mask properties as follows:

- a. Set the IP address.

If the workstation's network interface card is configured to use a static IP address you must configure it to obtain an IP address automatically.

- b. Set the Subnet mask to: 255.255.0.0

Notes:

- a. You might be prompted to restart the workstation after you have changed the configuration.
- b. Do not be concerned if you do not have a DHCP server on your network. This configuration automatically assigns an unused IP address to the workstation that is on the same subnet as the xSeries appliance servers attached to the LAN.
- c. If you are not certain how to check the workstation network TCP/IP protocol configuration settings refer to the Microsoft Windows documentation that came with your workstation for network configuration instructions.

6. Connect to the xSeries 150 Appliance using the Terminal Services Client.

7. In the Terminal Services Client window, type

IBM-xxxxxxx

where xxxxxx is the serial number located in the lower right corner of the bezel and then click **Connect**.

8. Login to the xSeries appliance server.

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

User ID administrator

Password password

When you log on to Window Terminal Services, you can view the Web Hosting Appliance graphical user interface (GUI) that is used to administer the appliance. However, when you first log onto Terminal Services, the Setup and Configuration Web page opens. This page provides links to documentation related to various xSeries software products.

- To complete the client installation, add to the appliance any Web content or applications required by your site.
- Refer to the Web page mentioned above, the IBM xSeries 150 Documentation CD and the following Web site for assistance in using preinstalled software:

<http://www.ibm.com/pc/netfinity>

After the web page loads, click Solutions.

Chapter 5. Using the Recovery and Supplementary CDs

This chapter describes the applications included on the xSeries 150 Supplementary and Recovery CDs, and how and when you should use them.

Note: The IBM xSeries 150 is a preloaded appliance server. Changing the preloaded software configuration in any way, including applying or installing unauthorized service packs or updates to preinstalled software, or installing additional software products that are not included in either the preloaded image or on the Supplementary CD is not supported and could cause unpredictable results. To correct problems with a preloaded software component, you must backup your user and system data; then, use the Recovery CD to restore the preloaded software image. You can obtain IBM authorized updates for this preloaded appliance from the following site:

<http://www.ibm.com/eserver/xseries>

Using the Recovery Enablement Diskette and Recovery CD

The Recovery CD is a startable CD that contains the preload image for your xSeries 150 and is used to recover the preloaded image on your server. You must start your server using the Recovery Enablement Diskette before you will be able to use the Recovery CD.

Important

The Recovery Enablement Diskette enables the xSeries 150 to start from the CD-ROM drive. You will not be able to restore the preload image from the Recovery CD without first restarting the server using the Recovery Enablement Diskette.

To recover the preloaded image on your server:

1. Insert the diskette into the diskette drive and restart the server.

When the Recovery Enablement Diskette has completed loading and reconfiguring your server startup sequence the server will begin beeping. Do not continue with this procedure until the server begins beeping.

2. Remove the Recovery Enablement Diskette from the diskette drive.
3. Place the Recovery CD in the CD-ROM drive and restart the server.

The recovery process will begin automatically and the original manufacturing preload will be restored. After the preload image is restored the system restarts automatically and all final operating system configuration changes are performed.

Important

After the server restarts a series of configuration and system preparation programs that finish configuring the NOS are run automatically. These programs must finish running before you use any included applications (such as the IBM Advanced Appliance Configuration Utility or the Terminal Services Client) to connect to or configure your xSeries 150. Do not connect to or configure the xSeries 150 for at least 15 minutes after system restart. This notice applies only to the first time the xSeries 150 is started after using the Recovery CD.

Note: Logical Disk 0 will be configured to a 2GB NTFS boot partition. Any other previously configured logical disk drives will be left unchanged.

Important

The xSeries 150 is a "headless" system, meaning that there is no keyboard or mouse is attached to the server. Because of this, the preload image restore process cannot require interaction. Starting the Recovery CD will, without prompting the user, automatically destroy all data on the system drive. Use the Recovery Enablement Diskette and Recovery CD only when it is absolutely necessary to restore the preloaded system image.

Using the Supplementary CD

The Supplementary CD contains documentation and copies of key software applications that are preinstalled on your xSeries 150. The following table includes the names of the directories found on the Supplementary CD and a description of the contents of the directory.

Directory Name	Contents
IBM Advanced Appliance Configuration	IBM Advanced Appliance Configuration console and agent installation files. The IBM Advanced Appliance Configuration agent is preinstalled as a Windows Powered service on the xSeries 150. To install the Advanced Appliance Configuration console, run setup.exe from the x:\IBM Advanced Appliance Configuration directory, where x is the drive letter assigned to your CD-ROM drive.
DiskImages	Self-extracting diskette images for the Recovery Enablement Diskette (RecovDsk.exe) and the ServeRAID Configuration Reset diskette (SR33YCFG.EXE, SR3XYCFG.EXE). To make a diskette, run the executable file and insert HD 1.44 floppy diskette into drive A: when prompted. Be sure to read the readme!.txt file located in this directory for last minute and model specific updates. Attention: Starting your system with the ServeRAID Configuration Reset diskette will reset your ServeRAID adapter to factory default settings. All data stored in your ServeRAID array will be lost. Use this diskette only if you want to reset the xSeries 150 to factory default settings.
I386	Windows Powered installation files. If you add device drivers, OS features, etc, you may be prompted to insert your Windows Powered CD-ROM. If so, insert the Supplementary CD, and specify path x:\i386 where x is the drive letter assigned to your CD-ROM drive.

Directory Name	Contents
Services for UNIX 2.0	SFU 2.0 installation files. If you add features that are not preloaded, you will be prompted for this CD.
Terminal Services Client	<p>The stand-alone Win32 Terminal Services Client application. The NAS appliance supports web-based terminal services, so this is an optional installation.</p> <p>To install the Terminal Services Client, run setup.exe from the Disk1 subdirectory.</p>
readme.txt	This is a text file that describes the contents of the Supplementary CD.

Chapter 6. Solving problems

This section provides basic troubleshooting information to help you resolve some common problems that might occur while setting up your server.

If you cannot locate and correct the problem using the information in this section, refer to the "Solving problems" section in the *User's Reference* on the *IBM xSeries Documentation* CD and the "Support for xSeries Servers" flowchart in the front of this booklet for additional information.

Note: The IBM xSeries 150 is a preloaded appliance server. Changing the preloaded software configuration in any way, including applying or installing unauthorized service packs or updates to preinstalled software, or installing additional software products that are not included in either the preloaded image or on the Supplementary CD is not supported and could cause unpredictable results. To correct problems with a preloaded software component, you must backup your user and system data; then, use the Recovery CD to restore the preloaded software image. You can obtain IBM authorized updates for this preloaded appliance from the following site:

<http://www.ibm.com/eserver/xseries>

Diagnostic tools overview

If you are unable to connect to your appliance, first confirm that the problem is not being caused by a network connectivity issue. Once you have confirmed network connectivity, contact IBM service or attach a monitor, mouse, and keyboard to your appliance and troubleshoot the appliance server using the following tools and procedures.

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

- **Beep codes and error messages**

The power-on self-test (POST) generates beep codes to indicate successful test completion or the detection of a problem.

- One beep indicates successful completion of POST.
- More than one beep indicates that POST detected a problem. Error messages also appear during startup if POST detects a hardware-configuration problem.

See "POST beep code descriptions" on page 30 and "POST error messages" on page 30 for more information.

- **Troubleshooting chart**

This chart lists problem symptoms, along with suggested steps to correct the problems. See the "Troubleshooting chart" on page 32 for more information.

- **Event/error logs**

The POST Error Log contains the three most recent error codes and messages that the system generated during POST. The System Event/Error Log contains all error messages issued during POST and all system status messages from the Netfinity Advanced System Management Processor.

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

- **Diagnostic programs and error messages**

The server diagnostic programs are stored in upgradable read-only memory (ROM) on the system board. These programs are the primary method of testing the major components of your server.

Note: Refer to the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation CD* for more detailed information about the diagnostic programs.

POST beep code descriptions

POST emits one beep to signal successful completion. If POST detects a problem during startup, other beep codes might occur. You can use the following beep code descriptions to help identify and resolve problems that are detected during startup.

Note: Refer to the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation CD* for more detailed information about the POST beep codes.

Table 2. POST beep code descriptions

Beep code	Descriptions of the POST beep codes
No beep	Call for service.
Continuous	If no video appears, the startup microprocessor failed. Verify that the startup microprocessor is installed correctly. If it is, replace the startup microprocessor. If the problem persists, call for service.
One short	POST completed successfully. One beep also occurs after POST if you enter an incorrect password.
Two short	Follow the instructions that appear on the screen.
Three short	POST detected a system memory error. Verify that the memory is installed correctly. If it is, replace the failing memory module.
Repeating short	The system board might contain a failing component. <ol style="list-style-type: none"> 1. Verify that the keyboard and pointing devices are connected properly. 2. Ensure that nothing is resting on the keyboard. 3. Disconnect the pointing device; then, restart the server. If the problem goes away, replace the pointing device. If the problem remains, call for service.
One long and one short	If the video controller on the system board is being used, call for service. If you installed an optional video adapter, replace the failing adapter.
One long and two short	A video I/O adapter ROM is not readable, or the video subsystem is defective. If you installed an optional video adapter, replace the failing adapter. If the problem remains, call for service.
One long and three short	The system-board video subsystem has not detected a monitor connection to the server. Ensure that the monitor is connected to the server. If the problem persists, replace the monitor.
Two long and two short	POST does not support the optional video adapter. Replace the optional video adapter with one that is supported by the server or use the integrated video controller.
All other beep codes	<ol style="list-style-type: none"> 1. Verify that the system memory modules are installed correctly. 2. Turn off the server; then, restart the server. If the problem remains, call for service.

POST error messages

The following table provides an abbreviated list of the error messages that might appear during POST.

Note: Refer to the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation* CD for more detailed information about POST error messages.

Table 3. Abbreviated list of POST error messages

POST message	Failing device or problem found	Suggested action
129	L1 cache of a microprocessor	Check the installation of your microprocessors.
162	Change in device configuration	Verify that your optional devices are turned on and installed correctly.
163	Time of day has not been set	Set the correct date and time.
164	Change in memory configuration	Verify that your memory is installed properly; then, restart the server and run the Configuration/Setup Utility program.
201	Change in memory configuration	Verify that your memory is fully seated and installed properly.
229	L2 cache of a microprocessor	Check the installation of your microprocessors.
289	Failing DIMM was disabled	Verify that your memory is correct for your server and that it is installed properly.
301 303	Keyboard and keyboard controller	Ensure that the keyboard cable is connected and nothing is resting on the keyboard keys.
962	Parallel port configuration error	Start the Configuration/Setup program and verify that the parallel-port setting is correct.
11xx	Serial port error	Verify that the serial cable is connected correctly.
1162	Serial port configuration conflict	Start the Configuration/Setup program and ensure that the IRQ and I/O port assignments needed by the serial port are available.
1601	BIOS update needed	Download and install the latest system BIOS level.
1800	PCI adapter hardware interrupt	Start the Configuration/Setup program and verify that the interrupt resource settings are correct.
2400 2462	Video controller and memory	Verify that the monitor is connected correctly.
00019xxx	Processor <i>x</i> is not functioning or failed the built-in test	Verify that processor <i>x</i> is installed correctly. If the problem remains, replace processor <i>x</i> .
00180xxx	A PCI adapter requested a resource that is not available	Start the Configuration/Setup program and ensure that the resources needed by the PCI adapter are available.
012980xx 012981xx	Data for processor <i>x</i>	Download and install the latest system BIOS level.
01298200	Microprocessor speed mismatch	Install microprocessors with identical speeds.
I9990305	POST could not find an operating system.	Install your operating system.

Troubleshooting chart

Notes:

1. See the "Solving Problems" section in the *User's Reference* on the *IBM xSeries Documentation CD* for more detailed troubleshooting charts.
2. If you cannot find the problem in the troubleshooting charts, run the diagnostic programs. If you have run the diagnostic test programs, or if running the tests does not reveal the problem, call for service.

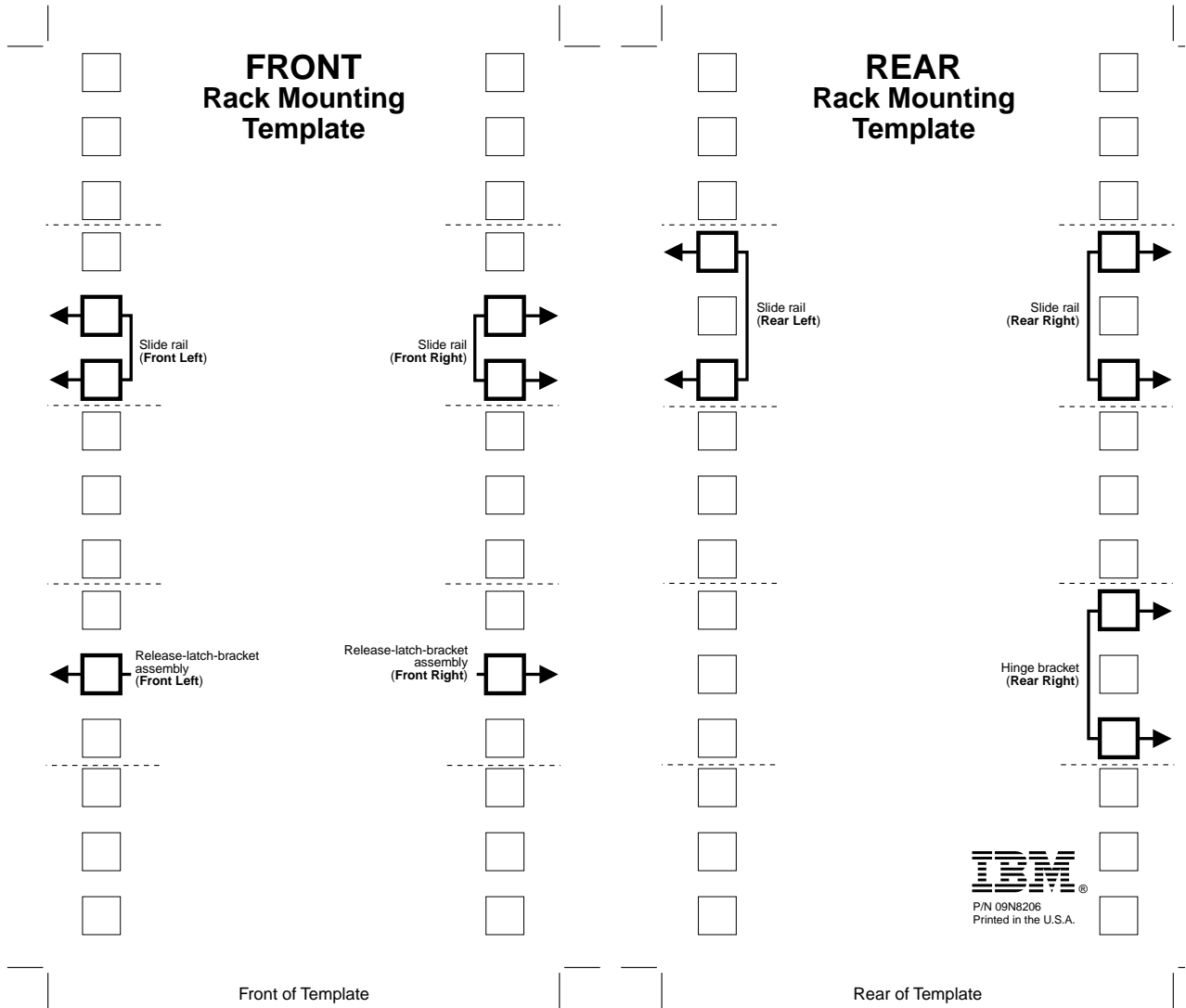
Monitor	Suggested action
Testing	<p>Some IBM monitors have their own self-tests. If you suspect a problem with your monitor, refer to the information that comes with the monitor for adjusting and testing instructions.</p> <p>If you still cannot find the problem, call for service.</p>
The screen is blank.	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The server power cord is plugged into the server and a working electrical outlet. 2. The monitor cables are connected properly. 3. The monitor is turned on and the Brightness and Contrast controls are adjusted correctly. <p>If the items above are correct and the screen remains blank, call for service.</p>
Only the cursor appears.	Call for service.
The monitor works when you turn on the server, but goes blank when you start some application programs.	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The primary monitor cable is connected to the video port. 2. You installed the necessary device drivers for the applications. <p>If the items above are correct and the screen remains blank, call for service.</p>
Wavy, unreadable, rolling, distorted screen, or screen jitter.	<p>If the monitor self-tests show the monitor is OK, 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> <ol style="list-style-type: none"> 1. To prevent diskette drive read/write errors, be sure the distance between monitors and diskette drives is at least 76 mm (3 in.). 2. Non-IBM monitor cables might cause unpredictable problems. 3. An enhanced monitor cable with additional shielding is available for the 9521 and 9527 monitors. For information about the enhanced monitor cable, see your IBM reseller or IBM marketing representative. <p>If the problem remains, call for service.</p>
Wrong characters appear on the screen.	<p>If the wrong language is displayed, update the BIOS with the correct language.</p> <p>If the problem remains, call for service.</p>

Power problems	Suggested action
The server does not power on.	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The power cables are properly connected to the server. 2. The electrical outlet functions properly. 3. The type of memory that is installed is correct. 4. 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. 5. The LEDs on the power supply are on. <p>If the problem remains, call for service.</p>
Microprocessor problems	Suggested action
The server emits a continuous tone during POST.	<p>The startup (boot) microprocessor is not working properly.</p> <p>Verify that the startup microprocessor is seated properly. If it is, replace the startup microprocessor.</p> <p>If the problem remains, call for service.</p>
Memory problems	Suggested action
The amount of memory displayed is less than the amount of memory installed.	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The memory modules are seated properly. 2. You have installed the correct type of memory. 3. If you changed the memory, you updated the memory configuration with the Configuration/Setup Utility program. 4. 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>If the above items are correct, run the memory diagnostic program. The system might have detected a bad memory module and automatically reallocated memory to enable you to continue to operate. If the memory tests fail, call for service or replace the failing DIMM.</p>
Option problems	Suggested action
An IBM option that was just installed does not work.	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The option is designed for the server. Refer to the "Support for Netfinity Servers" flowchart for information about obtaining ServerProven™ compatibility information from the World Wide Web. 2. You followed the installation instructions that came with the option. 3. The option is installed correctly. 4. You have not loosened any other installed options or cables. 5. 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 remains, call for service.</p>

Expansion enclosure problems	Suggested action
<p>The SCSI expansion enclosure used to work, but does not work now.</p>	<p>Verify that:</p> <ol style="list-style-type: none"> 1. The cables for all external SCSI options are connected correctly. 2. The last option in each SCSI chain, or the end of the SCSI cable, is terminated correctly. 3. Any external SCSI option is turned on. You must turn on an external SCSI option before turning on the server. <p>For more information, see your SCSI and expansion enclosure documentation.</p>
Service processor problems	Suggested action
<p>Netfinity Service Processor Manager reports a general monitor failure</p>	<p>Disconnect the server from all electrical sources, wait for 30 seconds, reconnect the server to the electrical sources, and restart the server.</p> <p>If a problem remains, call for service.</p>

Appendix A. Rack Installation Instructions

The following reduced-size illustration of the front and the back of the rack mounting template shows where to place the clip nuts or cage nuts when installing your server in a rack.



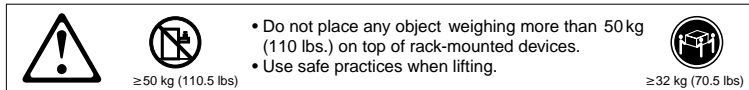
Front of Template

Rear of Template

NOTE TO PRINTER: Final Size 5" X 9" Colors: Black

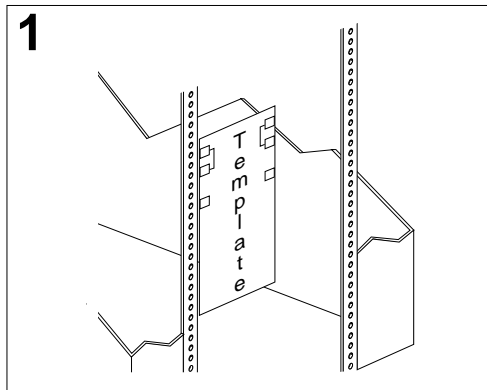
Rack Mounting Instructions

- Review the documentation that comes with your rack enclosure.
- Maintain 15 cm (6 in.) of clearance around your server for air circulation.
- Ensure the room air temperature is below 35°C (95°F).
- Plan the server installation working from the bottom of the rack up.
- Remove the rack doors and the side panels during the installation, if necessary.
- Position the template to the rack so that the edges of the template do not overlap any other devices to be installed.
- Connect all power cords on the server and on other devices to properly wired and grounded electrical outlets.
- Take precautions to prevent the rack from overloading the power outlets when you install multiple devices in a rack.

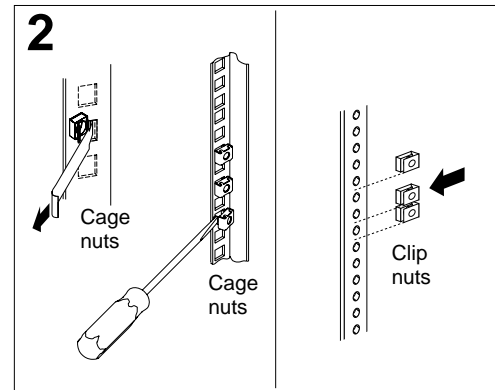


The following is a list of items shipped in your rack installation kit. If any items are missing or damaged, contact your place of purchase.

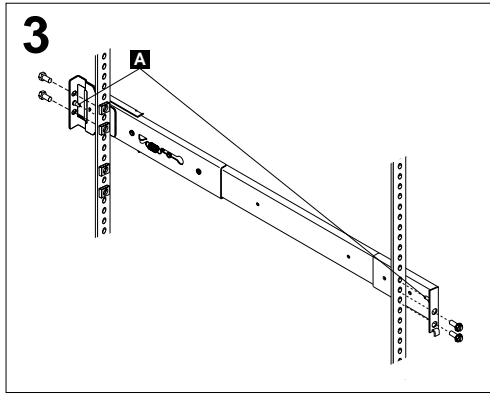
- Cable-management assembly
- Cable straps (7)
- Cable ties (10)
- Cage nuts (12)
- Clip nuts (12)
- Screw packages (2)
- Slide rails (2)



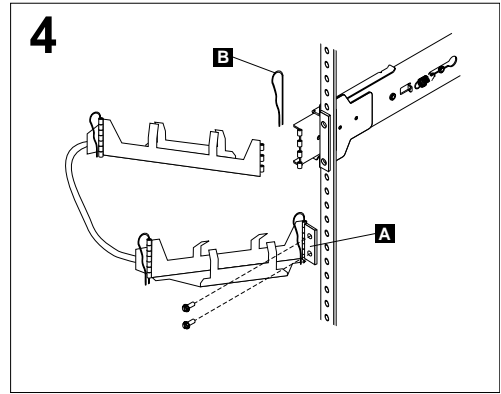
1 Use the attached stickers to mark the holes on the front and the rear of the rack in the locations indicated by the arrows on the template.



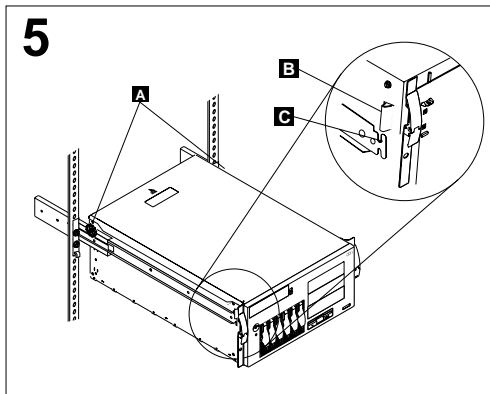
2 Use a screwdriver or the cage-nut-insertion tool to insert the cage nuts, or slide on the clip nuts, as required for your rack, into all the marked holes.



Use the pins **A** on the slide rail to align the slide rail to the rack. Use the M6 screws to bolt the slide rail to the rack (left front of rack shown here). Repeat this step for the other slide rail.



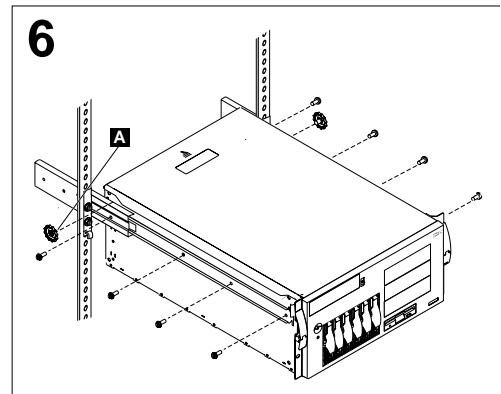
Use the M6 screws to attach the hinge bracket **A** to the rear of the rack. Then, use the hinge pin **B** to attach the cable-management assembly to the slide rail. (Right rear of rack shown here).



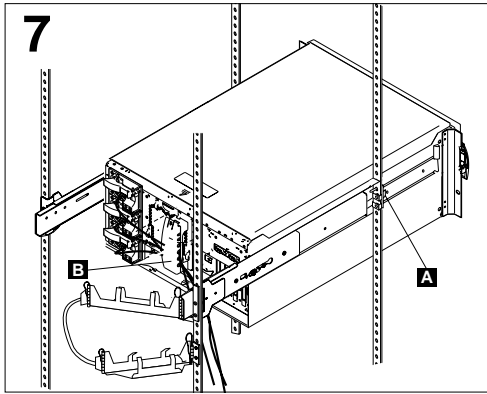
Attention: To avoid injury, do not place your fingers around the rack-support wheels when lowering the server onto the rails.

Fully extend the slide rails out of the rack. Lift the server above the rails; then, rest the rack-support wheels **A** located on the rear of the server on the slide rails. Lower the front of the server onto the slide rails.

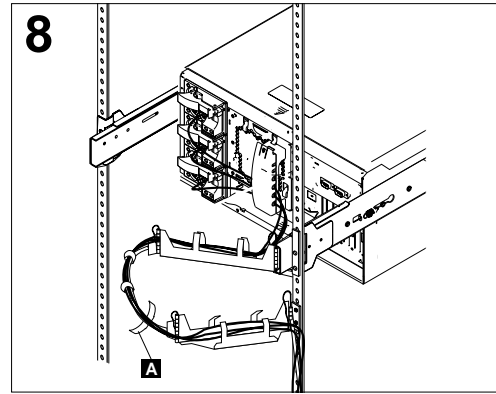
Note: Be sure the bracket notches **B** on the front of the server fit securely on the tabs **C** located on the front of the slide rails.



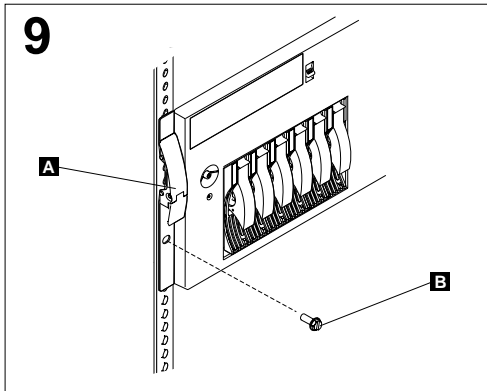
Use the M4 screws to secure the server to the rails. Unscrew the rack-support wheels **A** and store them in a safe place.



Press in on the safety latches **A** and slide the server halfway into the rack. Attach the power, keyboard, mouse, and monitor cables (if required) to the server and route them through the cable restraint bracket **B**. Then, attach all other required cables to the server.



Route all the cables through the cable-management assembly as shown. Then, use the cable straps **A** or the cable ties to secure the cables to the cable-management assembly.



Slide the server into the rack until the release latches **A** snap shut. Then, insert the M6 screws **B** through the release-latch-bracket assembly. **Note:** Inserting the M6 screws **B** is optional, unless you are moving the rack or the rack is in a vibration-prone area.

Refer to your server documentation to complete the installation.

Store these instructions in the binder that comes with your server.



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Appendix B. Product warranties and notices

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

Warranty Statements

The warranty statements consist of two parts: Part 1 and Part 2. Part 1 varies by country. Part 2 is the same for all countries. Be sure to read both the Part 1 that applies to your country and Part 2.

- **United States, Puerto Rico, and Canada (Z125-4753-05 11/97)**
(page 39, Part 1 - General Terms)
- **Worldwide except Canada, Puerto Rico, Turkey, and United States (Z125-5697-01 11/97)**
("Part 1 - General Terms," on page 42)
- **Worldwide Country-Unique Terms**
("Part 2 - Worldwide Country-Unique Terms" on page 45)

IBM Statement of Limited Warranty for United States, Puerto Rico, and Canada (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 may 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 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.

Machine- @server xSeries 150

Warranty Period* - Three Years

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

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. 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.

During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

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. The replacement may not be new, but will be in good working order.

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.

Unless specified otherwise, IBM provides non-IBM machines **WITHOUT WARRANTIES OF ANY KIND.**

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 the Machine, contact your reseller or IBM. In the United States, call IBM at 1-800-772-2227. In Canada, call IBM at 1-800-565-3344. You may be required to present proof of purchase.

IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, 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. IBM may repair the failing Machine or exchange it at its discretion.

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.

Any feature, conversion, or upgrade IBM or your reseller services must be installed on a Machine which is 1) for certain Machines, the designated, serial-numbered Machine and 2) at an engineering-change level compatible with the feature, conversion, or upgrade. 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.

Production Status

Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

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), 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 greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

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 (INCLUDING LOST PROFITS OR 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.

IBM Statement of Warranty Worldwide except Canada, Puerto Rico, Turkey, United States (Part 1 – General Terms)

This Statement of Warranty includes Part 1 - General Terms and Part 2 - Country-unique Terms. **The terms of Part 2 may replace or modify those of Part 1.** The warranties provided by IBM in this Statement of 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 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.

Machine- @server xSeries 150

Warranty Period* - Three Years

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During the warranty period IBM or your reseller, if approved by IBM to provide warranty service, will provide repair and exchange service for the Machine, without charge, under the type of service designated for the Machine and will manage and install engineering changes that apply to the Machine.

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. The replacement may not be new, but will be in good working order.

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.

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IBM or your reseller provides certain types of repair and exchange service, either at your location or at a service center, 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. IBM may repair the failing Machine or exchange it at its discretion.

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.

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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.

Production Status

Each IBM Machine is manufactured from new parts, or new and used parts. In some cases, the Machine may not be new and may have been previously installed. Regardless of the Machine's production status, IBM's appropriate warranty terms apply.

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), 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 greater of U.S. \$100,000 (or equivalent in local currency) or the charges (if recurring, 12 months' charges apply) for the Machine that is the subject of the claim.

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 (INCLUDING LOST PROFITS OR 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.

Part 2 - Worldwide Country-Unique Terms

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 legislation and are only limited to the extent permitted by the applicable legislation.

Extent of Warranty: The following replaces the first and second sentences of this Section:

The warranty does not cover the repair or exchange of a Machine resulting from misuse, accident, modification, unsuitable physical or operating environment, operation in other than the Specified Operating Environment, improper maintenance by you, or failure caused by a product for which IBM is not responsible.

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, 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.

PEOPLE'S REPUBLIC OF CHINA: Governing Law: The following is added to this Statement:

The laws of the State of New York govern this Statement.

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 Warranty, IBM's liability will be limited to the charge paid by you for the individual Machine that is the subject of the claim.

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.

EUROPE, MIDDLE EAST, AFRICA (EMEA)

The following terms apply to all EMEA countries.

The terms of this Statement of Warranty apply to Machines purchased from an IBM reseller. If you purchased this Machine from IBM, the terms and conditions of the applicable IBM agreement prevail over this warranty statement.

Warranty Service

If you purchased 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 purchased 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.

The applicable laws, Country-unique terms and competent court for this Statement are those of the country in which the warranty service is being provided. However, the laws of Austria govern this Statement if the warranty service is provided in Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Federal Republic of Yugoslavia, Georgia, Hungary, Kazakhstan, Kirghizia, Former Yugoslav Republic of Macedonia (FYROM), Moldova, Poland, Romania, Russia, Slovak Republic, Slovenia, and Ukraine.

The following terms apply to the country specified:

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

2. 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.

Applicability of suppliers and resellers (unchanged).

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

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

GERMANY: 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 are 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.

Production Status: The following paragraph replaces this Section:

Each Machine is newly manufactured. It may incorporate in addition to new parts, re-used parts as well.

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

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

In item 2, replace "U.S. \$100,000" with "1.000.000 DEM."

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

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

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 the greater of Irish Pounds 75,000 or 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: (item 1 unchanged) 2) as to any other actual damage arising in all situations involving non-performance 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 second 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.

TURKIYE: Production Status: The following replaces this Section:

IBM fulfills customer orders for IBM Machines as newly manufactured in accordance with IBM's production standards.

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 the greater of Pounds Sterling 150,000 or 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 will be limited to damages.

NORTH AMERICA

CANADA: Warranty Service: The following is added to this section:

To obtain warranty service from IBM, call **1-800-565-3344**.

UNITED STATES OF AMERICA: Warranty Service: The following is added to this section:

To obtain warranty service from IBM, call **1-800-772-2227**.

End-User License Agreement: Microsoft Windows Powered Operating System

IMPORTANT—READ CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and the manufacturer ("Manufacturer") of the computer system (as defined below, "xSeries 150") with which you acquired the Microsoft software product identified above ("Product"). If the Product is not accompanied by a new xSeries 150, you may not use or copy the Product. The Product includes computer software, the associated media, any printed materials, and any "online" or electronic documentation. This EULA is valid and grants the end-user license rights **ONLY** if the Product is genuine and a genuine Certificate of Authenticity for the Product is included as part of the Product. Any software provided along with the Product that is associated with a separate end-user license agreement is licensed to you under the terms of that license agreement. By installing, copying, downloading, accessing or otherwise using the Product, you agree to be bound by the terms of this EULA. If you do not agree to the terms of this EULA, Manufacturer and Microsoft Licensing, Inc. ("MS") are unwilling to license the Product to you. In such event, you may not use or copy the Product, and you should promptly contact Manufacturer for instructions on return of the unused Product in accordance with Manufacturer's return policies.

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The capitalized terms used in this EULA are defined as follows:

- "xSeries 150" shall mean the computer with which you acquired the Product acting solely as an Appliance server;
- 1. **GRANT OF LICENSE.** This EULA grants you the following rights to the Product provided you comply with all its terms and conditions:
 - a. **Processor Limits.** You may use the Product with no more than two processors at any one time unless a higher number of allowed processors is indicated on the Certificate of Authenticity for the Product.

- b. **General Purpose Functionality.** The Product may contain services and functionality of a general-purpose server. Notwithstanding that software for such services and functionality may be included as part of the Product, you agree not to use the following general-purpose functionality.
- **File Services**, (accessing or managing files or disk storage)
 - **Print Services**, (printing to a printer managed by the Product)
 - **Terminal Services**, except to the limited extent necessary to administer the Product in Administration Mode, on the xSeries 150 or remotely, for up to two connections;
 - **Microsoft Clustering Service**, other than the Windows Load Balancing Service;
 - **Network Infrastructure Services**, including without limitation Dynamic Host Configuration Protocol (DHCP) services, Domain Name System (DNS) service, Routing and Remote Access Service or Windows Internet Name Service (WINS);
- and
- **Authentication Services**, including but not limited to direct use of the Product or indirect use through other computers or servers of: (i) domain controller (DCPromo.exe) functionality, (ii) the Windows NT Server or Windows 2000 Server Integrated Sign-On Service or (iii) the Product to receive credentials from the Windows NT Server or Windows 2000 Directory Services.

If you wish to make use of such functionality, you must acquire licenses for Windows 2000 Server or Windows 2000 Advanced Server.

- c. **Client Access License ("CAL") Requirements.** You must acquire a separate CAL for each electronic device that accesses or makes use of Authentication Services.
- d. **Deploying CALs.** You may deploy CALs for the Product only in "**Per Seat**" mode. In "Per Seat," you need a separate CAL for each unique electronic device that accesses or utilizes the Server Software, as described in Section 1.d. above.
- e. **Other Rights and Limitations.**
- **Language Version Selection.** Manufacturer may have elected to provide you with a selection of language versions of the Product. In such event, you are licensed to use only one of the language versions provided. As part of the setup process for the Product you will be given a one-time option to select a language version. Upon selection, the language version selected by you will be set up on the xSeries 150, and the language version(s) not selected by you will be automatically and permanently deleted from the hard disk of the xSeries 150.
 - **Single EULA.** The package for the Product may contain multiple versions of this EULA, such as multiple translations and/or multiple media versions (e.g., in the user documentation and in the software). In this case, you are only licensed to use one (1) copy of the Product.
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 9. **BACK-UP COPY.** If Manufacturer has not included a back-up copy of the Product with the xSeries 150, you may make a single back-up copy of the Product. You may use the back-up copy solely for archival purposes.
 10. **SINGLE COMPUTER.** The Product is licensed with the xSeries 150 as a single integrated product. The Product may only be used with the xSeries 150, except as expressly provided in this EULA.
 11. **LEASED HARDWARE.** In the event that you receive the xSeries 150 under the terms of a lease from Manufacturer or Manufacturer's third-party representative, the following additional terms shall apply: (i) you may not transfer the Product to another user as part of the transfer of the xSeries 150, whether or not transfer of the Product with the xSeries 150 is otherwise allowed in this EULA; (ii) your rights with respect to any Product upgrades shall be as determined by the lease you signed for the xSeries 150; and (iii) you may not use the Product after your lease terminates, unless you purchase the xSeries 150 from Manufacturer.

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End-User License Agreement: Microsoft Windows Services for NetWare Version 5.0

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 - b. **Installation -- Services for NetWare Administrative Tools.** In addition to the rights granted in Section 1(a) above, you may install and use the "Services for NetWare Administrative Tools" of the Server Software on any computer that is running a validly licensed copy of Microsoft Windows 2000, for the purpose of administering access to file services.
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OS/2

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Federal Communications Commission (FCC) Class A Statement

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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

Canadian Department of Communications Compliance Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled *Digital Apparatus*, ICES-003 of the Department of Communications.

Avis de conformité aux normes du ministère des Communications du Canada

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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 community directive conformance statement

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electro-magnetic compatibility.

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Taiwan electrical emission statement

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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, Czech Republic, Egypt, Finland, France, French Guiana, Germany, Greece, Guinea, Hungary, Iceland, Indonesia, Iran, Ivory Coast, Jordan, Lebanon, Luxembourg, Macau, 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
14F0033	Antigua, Bahrain, Brunei, Channel Islands, Cyprus, Dubai, Fiji, Ghana, Hong Kong, 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
62X1045	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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