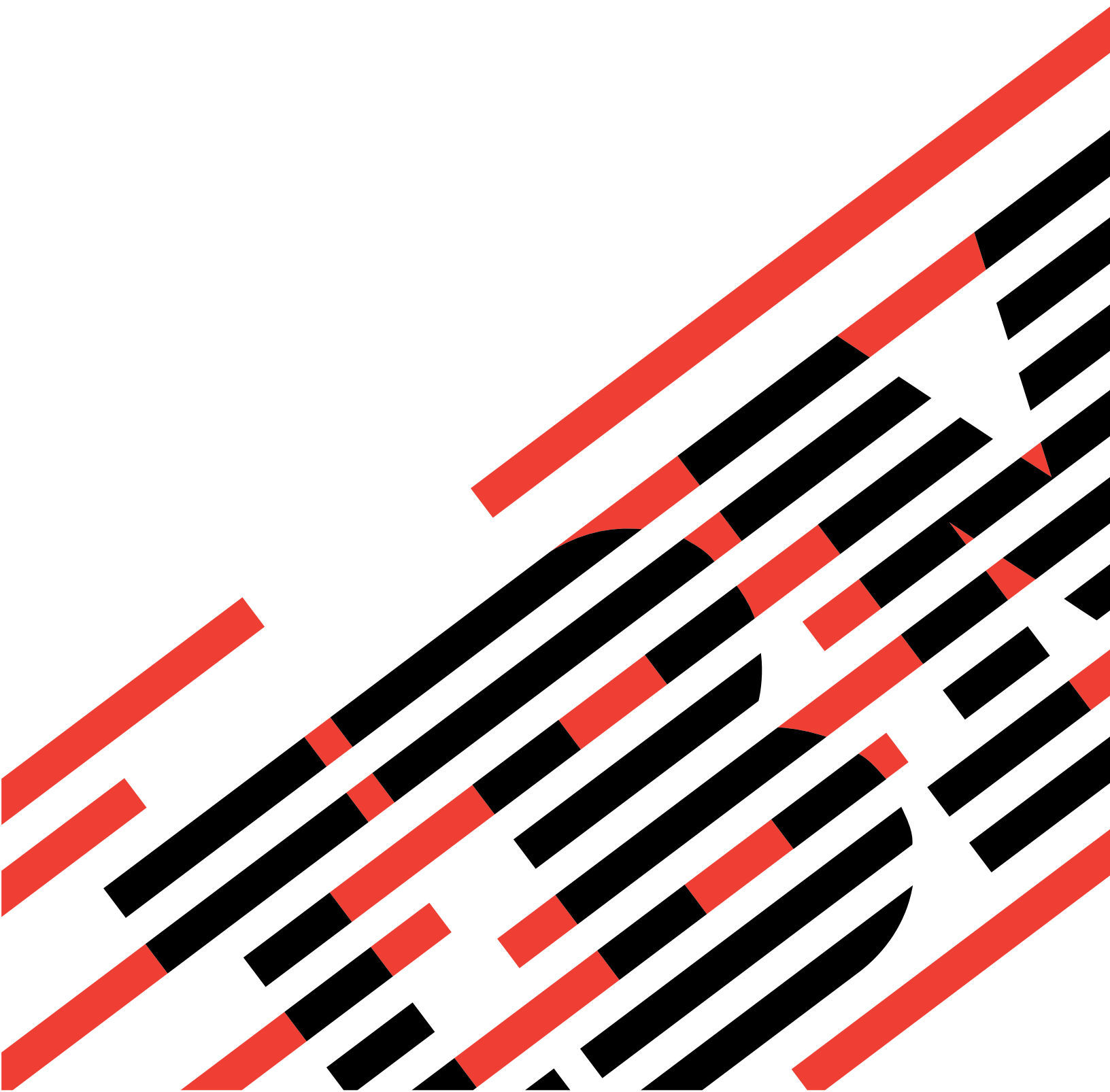




xSeries 450 FAQ  
Hints and Tips







@server

xSeries 450 FAQ  
Hints and Tips

**Note:** Before using this information and the product it supports, be sure to read the general information in "Notices", on page 35.

**First Edition (May 2003)**

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## Chapter 1. Introduction

The information provided in this document is based on technical observations and it is intended to supplement the IBM® @server™ xSeries™ 450 publications provided with the server. The topics are arranged alphabetically to help you find the information easily.

The latest versions of the xSeries 450 publications are available in Portable Document Format (PDF) from the IBM web site at <http://www.ibm.com/pc/support/>. (See "Locating updated xSeries 450 publications" on page 2 for detailed instructions.)

The xSeries 450 publications include the following:

- *IBM @server xSeries 450 Installation Guide*  
This printed publication is provided with the server and is on the IBM *xSeries 450 Documentation* CD. It contains instructions for setting up the server and basic instructions for installing some options. It also contains general information about the server.
- *IBM @server xSeries 450 User's Guide*  
This publication is provided on the IBM *xSeries 450 Documentation* CD. It contains general information about the server, including information about features, how to configure the server, and how to get help.
- *IBM @server xSeries 450 Option Installation Guide*  
This publication is provided on the IBM *xSeries 450 Documentation* CD. It contains detailed instructions for installing, removing, and connecting optional devices that the server supports.
- *IBM @server xSeries 450 Hardware Maintenance Manual and Troubleshooting Guide (HMM)*  
This publication is provided on the IBM *xSeries 450 Documentation* CD. It contains the information to help you solve server problems yourself, and information for service technicians.
- *IBM @server xSeries 450 Rack Installation Instructions*  
This printed publication is provided with the server and is on the IBM *xSeries 450 Documentation* CD. It contains instructions for installing the server in a rack.
- *IBM Safety Information*  
This publication is provided on the IBM *xSeries 450 Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *IBM Safety Information* book.
- *IBM @server xSeries 450 Planning and Installation Guide*  
This document is available for download from the IBM Web site at <http://www.ibm.com/redbooks/>.

You can obtain up-to-date information about the xSeries 450 server and other IBM server products at <http://www.ibm.com/eserver/xseries/>.

---

## Locating updated xSeries 450 publications

Complete the following steps to check for updated documentation and technical updates:

1. Go to <http://www.ibm.com/pc/support/>.
2. In the **Learn** section, click **Online publications**.
3. On the "Online publications" page, in the **Brand** field, select **Servers**.
4. In the **Family** field, select **xSeries 450**.
5. Click **Display documents**.

---

## Before you begin

Please read the following before you use the information in this document:

- Review the "Safety information" and "Handling static-sensitive devices" sections in the documentation provided with the server. These guidelines will help you work safely while working with the server or options.
- Back up all important data before you make changes to disk drives.
- For a list of supported options for the xSeries 450, refer to <http://www.ibm.com/pc/us/compat/> on the World Wide Web.

---

## Getting started

After you receive and unpack the server, verify the following:

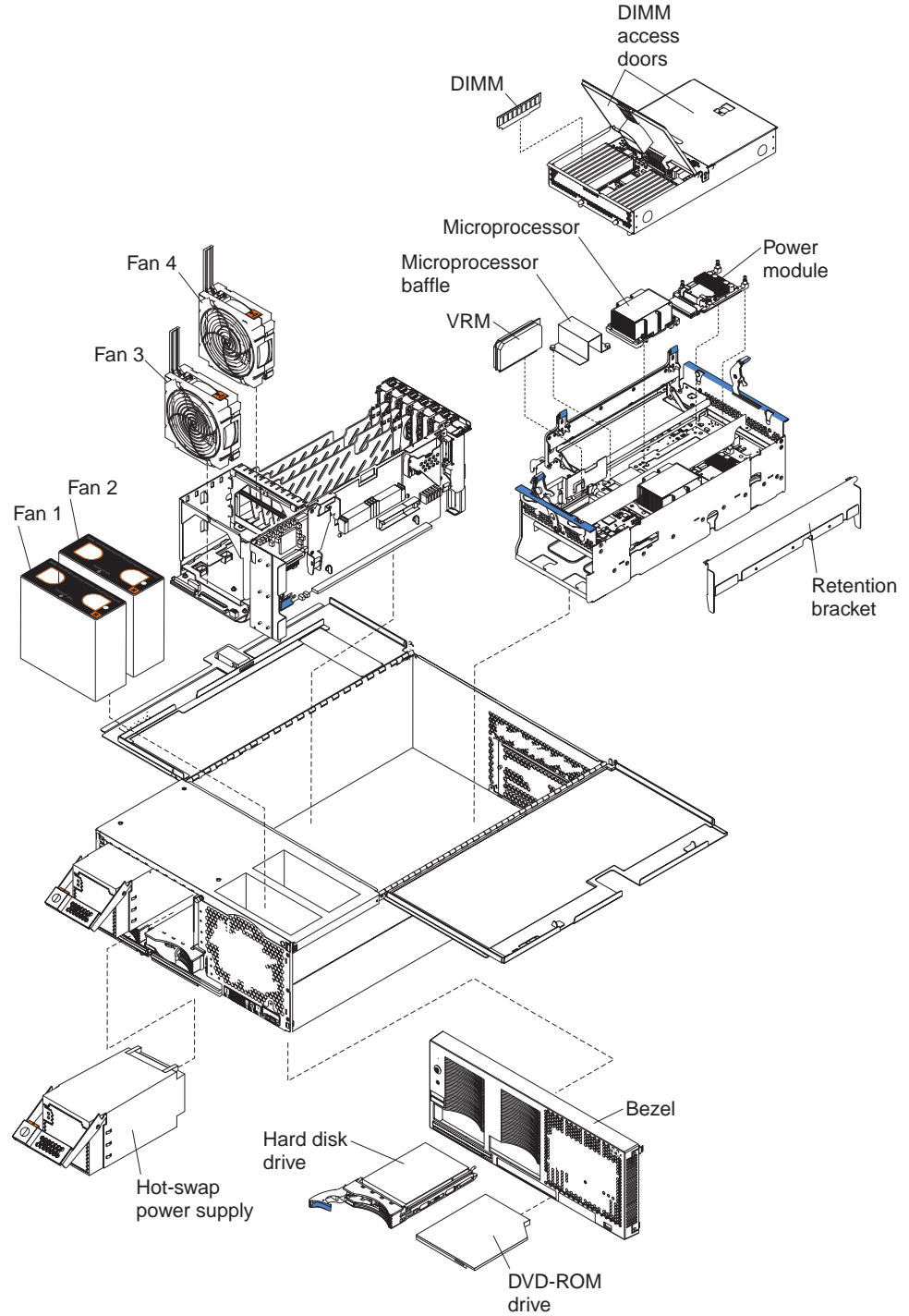
- All adapters, boards, fans, power supplies, and internal devices are fully seated and connected properly.
- All cables and cords are connected securely to the server and to any installed options.
- Each drive bay has either a drive or a filler panel installed.
- Each unoccupied PCI-X slot has an expansion-slot cover installed.
- Power supplies are installed in both power supply bays.
- Both power cords are plugged into the power supplies and into an ac power source.
- For redundant and hot-swappable operation, the power supplies are connected to 200-240 V ac. The power supplies are hot-swappable and redundant only at 200-240 V ac.
- All microprocessors have the same cache size and type, and the same clock speed.
- There is space around the server to allow the cooling system to work properly.
- The top cover is closed during normal operation. For proper cooling, do not leave the cover open for more than 15 minutes.
- The rack into which you plan to install the server has perforated doors.



# Major components of the xSeries 450

The following illustration shows the locations of major components in the xSeries 450 server.

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



# Features and specifications of the xSeries 450

The following table provides a summary of the server features and specifications:

<p><b>Microprocessor:</b></p> <ul style="list-style-type: none"> <li>Intel® Itanium® 2 900 MHz or higher, depending on server model</li> <li>1.5 MB (minimum) Level-3 cache</li> <li>200 MHz front-side bus (FSB), at two data transfers per cycle, yielding a 400 MHz system bus (minimum)</li> <li>Support for up to four microprocessors</li> <li>Xcel4™ Server Accelerator Cache: 64 MB</li> </ul> <p><b>Active Memory™:</b></p> <ul style="list-style-type: none"> <li>Minimum: 1 GB</li> <li>Maximum: 40 GB</li> <li>Type: 2-way interleaved PC2100, ECC DDR SDRAM, registered DIMMs only</li> <li>Supports 512 MB, 1 GB, and 2 GB dual inline memory modules (DIMMs)</li> </ul> <p><b>Drives standard:</b></p> <p>DVD/CD-RW: IDE</p> <p><b>Expansion bays:</b></p> <ul style="list-style-type: none"> <li>Two removable media bays (one DVD/CD-RW preinstalled)</li> <li>Supports up to two internal Ultra320 SCSI hard disk drives</li> </ul> <p><b>Active™ PCI-X expansion slots:</b></p> <p>Six 64-bit Active PCI-X expansion slots:</p> <ul style="list-style-type: none"> <li>Two 66 MHz PCI-X slots</li> <li>Two 100 MHz PCI-X slots</li> <li>Two 133 MHz PCI-X slots</li> </ul> <p><b>Cooling:</b></p> <p>Four hot-swap fans</p> <ul style="list-style-type: none"> <li>Two 150 mm x 51 mm fans</li> <li>Two 150 mm x 38 mm fans</li> </ul> <p><b>Acoustical noise emissions:</b></p> <ul style="list-style-type: none"> <li>Declared sound power, idle: 6.5 bels</li> <li>Declared sound power, operating: 6.5 bels</li> <li>Bystander sound pressure, idle: 49 dBa</li> <li>Bystander sound pressure, operating: 49 dBa</li> </ul>	<p><b>Power supply:</b></p> <p>Two power supplies: 550 watts at 100-127 V ac or 1050 watts at 200-240 V ac (hot-swappable and redundant at 200-240 V ac only)</p> <p><b>Video:</b></p> <ul style="list-style-type: none"> <li>Integrated ATI RageXL video</li> <li>PCI bus interface</li> <li>Compatible with SVGA</li> <li>8 MB SDRAM video memory</li> </ul> <p><b>Size (4 U):</b></p> <ul style="list-style-type: none"> <li>Height: 17.8 cm (7 inches, 4 U)</li> <li>Depth: 69.85 cm (27.5 inches)</li> <li>Width: 48.3 cm (19 inches)</li> <li>Maximum weight: 38.6 kg (85 lb), depending on the configuration</li> </ul> <p><b>Integrated functions:</b></p> <ul style="list-style-type: none"> <li>Broadcom 5704 10/100/1000 dual port Ethernet controller</li> <li>Light Path Diagnostics™</li> <li>One external and one internal Ultra320 SCSI port (dual-channel integrated controller with RAID capabilities)</li> <li>Remote Supervisor Adapter (service processor) <ul style="list-style-type: none"> <li>ASM interconnect (peer-to-peer) port</li> <li>Ethernet port</li> <li>Serial port</li> </ul> </li> <li>IDE controller</li> <li>RXE Management Port</li> <li>RXE Expansion Ports</li> <li>Three USB ports</li> <li>SCSI ports</li> <li>Serial port</li> <li>Wake on LAN®</li> </ul> <p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>Air temperature: <ul style="list-style-type: none"> <li>Server on: 10° to 35°C (50.0° to 95.0°F). Altitude: 0 to 914 m (2998.7 ft)</li> <li>Server on: 10° to 32°C (50.0° to 89.6°F). Altitude: 0 to 2133 m (6998.0 ft)</li> <li>Server off: -40° to 60°C (-104° to 140°F). Maximum altitude: 2133 m (6998.0 ft)</li> </ul> </li> <li>Humidity: <ul style="list-style-type: none"> <li>Server on: 8% to 80%</li> <li>Server off: 5% to 100%</li> </ul> </li> </ul>	<p><b>Heat output:</b></p> <p>Approximate heat output in British thermal units (Btu) per hour</p> <ul style="list-style-type: none"> <li>Minimum configuration: 854 Btu (250 watts)</li> <li>Maximum configuration: 2646 Btu (775 watts)</li> </ul> <p><b>Electrical input:</b></p> <ul style="list-style-type: none"> <li>Sine-wave input (50-60 Hz) required</li> <li>Input voltage low range: <ul style="list-style-type: none"> <li>Minimum: 100 V ac</li> <li>Maximum: 127 V ac</li> </ul> </li> <li>Input voltage high range: <ul style="list-style-type: none"> <li>Minimum: 200 V ac</li> <li>Maximum: 240 V ac</li> </ul> </li> <li>Input kilovolt-amperes (kVA) approximately: <ul style="list-style-type: none"> <li>Minimum: 0.250 kVA</li> <li>Maximum: 1.3 kVA</li> </ul> </li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>Power consumption and heat output vary depending on the number and type of optional features installed and the power-management optional features in use.</li> <li>These levels were measured in controlled acoustical environments according to the procedures specified by the American National Standards Institute (ANSI) S12.10 and ISO 7779 and are reported in accordance with ISO 9296. Actual sound-pressure levels in a given location might exceed the average values stated because of room reflections and other nearby noise sources. The declared sound-power levels indicate an upper limit, below which a large number of computers will operate.</li> </ol>
--	---	---

---

## Chapter 2. Hints and tips

This chapter contains some installation and troubleshooting hints and tips related to the @server xSeries 450 server. This information is intended to supplement the existing IBM @server xSeries 450 documentation (listed on page 1).

---

### Cursor disappears after exiting LSI utility

**Description:** When you exit from the LSI configuration utility to the Extensible Firmware Interface (EFI) prompt, the LSI configuration utility does not restore the standard blinking cursor.

**Solution:** To re-enable the blinking cursor, type `exit` at the EFI prompt; then, select **EFI Shell** from the Boot Manager.

---

### Device drivers

**Related topics:**

- "PCI hot-plug features with the Linux operating system" on page 20.
- "Resource CD" on page 31.

The *Resource CD* that comes with the xSeries 450 server contains the following device drivers:

- Ethernet device driver
- Debug port and debug support EFI device drivers

To download the latest Active PCI, Advanced System Management, and Ethernet device drivers for the xSeries 450, go to the IBM Support Web site at <http://www.ibm.com/pc/support/> on the World Wide Web.

---

## Drives

### Diskette drive

The xSeries 450 server supports one diskette drive.

- The diskette drive must be installed in the left drive bay.
- The operating system in use must support a diskette drive.

**Note:** The IDE drives in the xSeries 450 server are not hot-swappable.

### DVD/CD-RW drive

The xSeries 450 server supports up to two CD-ROM drives, or two DVD-ROM drives, or a combination.

- If you have only one IDE device installed, it must be installed in the right removable-media bay.
- CD-ROM or DVD-ROM drives can be installed in either removable-media bay.

### Hot-swap hard disk drives

The xSeries 450 supports up to two internal Ultra160 or Ultra320 SCSI hot-swap hard disk drives. The internal hard disk drive bays are connected directly to the integrated LSI 1030 SCSI controller. Connecting the internal hard disk drive bays to an optional SCSI adapter is not supported.

#### Notes:

1. To help ensure signal quality, do not mix drives with different speeds and data rates. Always install either two Ultra160 drives or two Ultra320 drives.
2. You must have level 27 (MZKT27A) or later SAL/EFI code installed to use the RAID level-1 feature of the integrated LSI 1030 SCSI controller.

### Using the diskpart utility to partition a drive

Complete the following steps to use the diskpart utility:

1. Start the server.
2. Select **EFI shell** from the EFI Boot Manager startup options.

**Note:** If EFI shell is not a choice on the list, the server has a customized startup configuration. Contact the System Administrator for further instructions.

3. Ensure that the media or file system (fsx:) where the diskpart utility resides is visible to EFI.
4. Type the following EFI command to start the diskpart utility:  
`diskpart`
5. Type the following EFI command to view the list of drives that can be modified:  
`list`
6. Type the following EFI command to select a drive to partition:  
`select x`

where x is the number of a drive listed in step 5.

7. Complete one of the following steps:
  - To clear all data from the partition:
    - a. Type the following EFI command:  
clean
    - b. Respond to the prompts as follows:  
y  
\$C
  - To clear all data from the partition and overwrite the disk with zeros:
    - a. Type the following EFI command:  
clean all
    - b. Respond to the prompts as follows:  
y  
\$C
- Notes:**
  - a. These commands might take a while to complete.
  - b. Additional commands are available to create MBR or GPT structures and partitions on the cleaned disk. Use the EFI Help command to view a list of the commands available. (Type help at the EFI prompt.)
8. When you are finished, repeat steps 6 and 7 to work with another drive; or, type the following command to exit the diskpart utility:  
exit
9. If you created a system partition using the diskpart.efi utility, you can use the efifmt.efi utility to format the partition. To view the syntax for the format command, type the following EFI command from the EFI shell:  
efifmt

---

## Error messages and indicators

**Related topics:**

- “Firmware updates” on page 9.
- “Light Path Diagnostics feature” on page 14.
- “Power supplies” on page 28.
- “Remote Supervisor Adapter” on page 28.
- “Remote console numeric keypad behaves unpredictably” on page 30.
- “System Health web page lists Intelligent I/O Expansion Unit fan failures” on page 30.
- “Troubleshooting” on page 31.

## Messages appear after a service processor flash update

**Description:** One or both of the following messages might appear in the event log after performing a service processor flash update:

```
Service Processor not configured for static partition.  
Recover Service Processor not configured for static partition.
```

**Solution:** No solution required. You can ignore these messages.

## Service processor logs system complex powered up and down messages during a system reset

**Description:** During POST, the xSeries 450 System Abstraction Layer (SAL) code can reset the system if it detects a potential initialization problem. If this occurs, the service processor might identify the reset as a power-off and power-on event, and then log messages similar to the following in the event log:

```
1  SERVPROC  03/21/03  18:38:53  System Complex Powered Up
2  SERVPROC  03/21/03  18:37:34  System Complex Powered Down
3  SAL/EFI    03/21/03  18:18:20  System initialization
4  SERVPROC  03/21/03  18:08:53  System Complex Powered Up
5  SERVPROC  03/21/03  18:07:34  System Complex Powered Down
```

The logged messages are normal and will vary, based on the operating system in use. Windows Server 2003 normally logs the following messages when you restart the system after using the Start→Shutdown procedure.

```
1  SAL/EFI    03/21/03  18:18:20  System initialization
2  SERVPROC  03/21/03  18:08:53  System Complex Powered Up
3  SERVPROC  03/21/03  18:07:34  System Complex Powered Down
4  SAL/EFI    03/21/03  18:18:20  Cold reset request
```

SuSE normally logs the following messages after you log off and restart the system:

```
1  SAL/EFI    03/21/03  18:18:20  System initialization
2  SERVPROC  03/21/03  18:08:53  System Complex Powered Up
3  SERVPROC  03/21/03  18:07:34  System Complex Powered Down
4  SAL/EFI    03/21/03  18:18:20  Warm reset request
```

When you use the Reset button on the front of the server to reset the system, the following messages are logged:

```
1  SERVPROC  03/21/03  18:08:53  System Complex Powered Up
2  SERVPROC  03/21/03  18:07:34  System Complex Powered Down
```

When ac power is removed from the system, the Remote Supervisor Adapter can no longer function. When this occurs, an entry might not appear in the event log indicating the loss of ac power.

**Solution:** No solution is required. These messages are informational only and do not affect system operation.

## Microprocessors report soft corrected errors

**Description:** Unlike IA-32 microprocessors, Itanium2 microprocessors using the Intel Machine Check Abort architecture might report soft corrected errors to the operating system, such as microprocessor cache soft errors.

- Linux users might find occasional reports of corrected errors when they view the Linux error log.
- Windows® users might see a yellow Machine Check Event indicator on the system console, which signifies that an error condition was reported to the Windows error log. Upon examination, you might find occasional entries in the event log of corrected errors reported by microprocessors.

**Solution:** Occasional soft correctable microprocessor errors are normal and can occur at any time using any operating system. These errors are handled with error correcting codes and other mechanisms, and system operation is not affected.

---

## Ethernet controllers

**Related topics:**

- “Resource CD” on page 31.
- “Wake on LAN” on page 32.

For device drivers and information about configuring the integrated Ethernet controllers, see the *Resource CD* that comes with the xSeries 450. For updated information about configuring the controllers, go to <http://www.ibm.com/pc/support/>.

---

## Firmware updates and recovery process

**Related topics:**

- “Creating a backup copy of the nonvolatile EFI variables” on page 29.
- “Restoring the nonvolatile EFI variables” on page 29.
- “Remote video graphics look incomplete when using Linux” on page 30.

## Firmware updates

IBM will periodically make firmware updates available for the xSeries 450 server. Firmware updates for the xSeries 450 are available from <http://www.ibm.com/pc/support/> on the World Wide Web.

**Note:** UpdateXpress does not provide support for the xSeries 450 server.

The update package will contain a ZIP file and an ISO image. The ZIP file and ISO image will contain xSeries 450 firmware updates for the following:

- System Abstraction Layer Extensible Firmware Interface (SAL/EFI) code
- Service Processor Drawer Management Controller (SP-DMC) code
- Hot Plug Controller (HPC) code
- Diagnostic code
- CMOS Programmable Logic Devices (CPLD) code

The method you use to update the xSeries 450 firmware depends on the operating system in use.

- If you are using the Windows Server 2003 operating system, see “Creating an update directory when using Windows Server 2003” on page 10 for more information.
- If you are using the SuSE Linux Enterprise Server 8 (SLES-8) for the Itanium Processor Family (IPF) operating system, see “Creating an update CD when using SLES-8” on page 10 for more information.

## Creating an update directory when using Windows Server 2003

If you are using the Windows Server 2003 operating system, use the instructions in this section to create an update directory on the system partition; then, refer to the readme.txt file in the root, under EFI.

Complete the following steps to create the update directory:

1. Log on to the server with administrative privileges.
2. Open a command prompt.
3. Type the following command to gain access to the EFI system partition:

```
mountvol x: /s
```

where x is any available drive letter. You now can access the system partition like you would any other system drive.

4. Create a directory on the system-partition drive (x:) to store the firmware update files.
5. Go to the IBM support site at <http://www.ibm.com/pc/support> on the World Wide Web; then, download the update package for the xSeries 450 to the directory you created in step 4.
6. Extract the xSeries 450 update package into the directory you created in step 4.

### Notes:

- a. When you extract the files, be sure to maintain the folder structure.
  - b. Detailed instructions for updating the firmware are provided in the readme files in each code-specific folder.
7. Shutdown the operating system; then, reboot the system to the EFI shell.
  8. Switch to the file system (fsx:) that corresponds to the system partition; then, change directories to the update directory.
  9. Use the instructions provided in the package readme.txt files to install the firmware updates.

## Creating an update CD when using SLES-8

If you are using the SLES-8 operating system, use the instructions in this section to create a firmware update CD from the ISO image; then, refer to the readme.txt file in the root of the firmware update CD, under EFI.

**Note:** Detailed instructions for using the CD to update the firmware are provided with the code in each code-specific subdirectory

Complete the following steps to create the CD:

1. The Linux IDE ATAPI CD-ROM driver uses SCSI emulation for CD-ROM Read and Write operations. If a boot option to enable IDE-SCSI emulation was not included during the initial install process, you will need to add the boot option manually to the `elilo.conf` file. In most cases, the IDE DVD/CD-RW in the xSeries 450 will be the first IDE device. To enable the IDE-SCSI emulation, add the following boot option to the stanza for the kernel you are booting:

```
append="hda=ide-scsi"
```



For example, if your stanza appears as follows:

```
image=/vmlinuz
label=linux
root=802
initrd=/initrd
append="console=ttyS0,115200n8, console=tty0"
```

Once modified, your stanza would appear as follows:

```
image=/vmlinuz
label=linux
root=802
initrd=/initrd
append="console=ttyS0,115200n8, console=tty0 hda=ide-scsi"
```

2. Restart the system.
3. Run the following command to verify that the ide-scsi driver is loaded; then, review the list of modules currently loaded and look for 'ide-scsi'.  

```
# lsmod
```
4. If the ide-scsi driver is in the list, go to step 5. If the ide-scsi driver is not in the list, run the following command to manually load the ide-scsi driver:  

```
# insmod ide-scsi
```
5. Run the following command to determine the SCSI bus (b), target (t), and lun (l) parameters for the DVD/CD-RW drive in the xSeries 450:  

```
# cdrecord -scanbus
```

Data similar to the following will appear:

```
scsibus0:
0,0,0 0) 'IBM-ESXS' 'ST318305LC !#' 'B244' Disk
0,1,0 1) 'IBM-ESXS' 'ST318305LC !#' 'B244' Disk
0,2,0 2) *
0,3,0 3) *
0,4,0 4) *
0,5,0 5) *
0,6,0 6) *
0,7,0 7) *
0,8,0 8) 'IBM ' '25P3495a S320 1' '1 ' Processor
scsibus2:
2,0,0 200) 'HL-DT-ST' 'RW/DVD GCC-4160N' '0012' Removable CD-ROM
2,1,0 201) *
2,2,0 202) *
2,3,0 203) *
2,4,0 204) *
2,5,0 205) *
2,6,0 206) *
2,7,0 207) *
```

6. Insert a blank, writable CD into the DVD/CD-RW drive; then, run the following command to burn the firmware update CD from the xSeries 450 ISO image:

```
# cdrecord -v dev=b,t,1 <ISO-image-file>
```

where 'ISO-image-file' is the name of the xSeries 450 ISO image file, 'b' is the SCSI bus, 't' is the SCSI target, and 'l' is the SCSI lun for your DVD/CD-RW device.

7. Use the instructions provided with the ISO image to install the firmware updates.

## Recovering SAL/EFI code

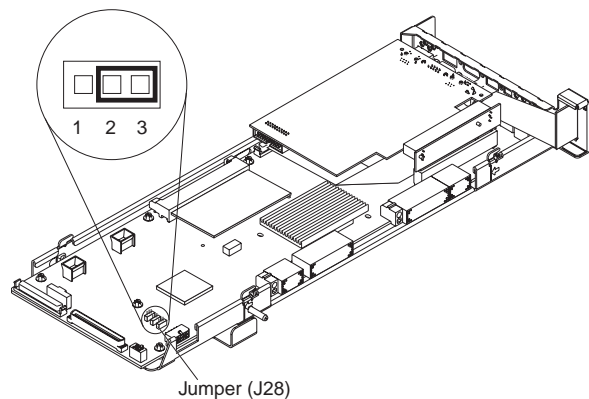
If the SAL/EFI code becomes damaged, such as from a power failure during a flash update, you can recover the SAL/EFI code using the SAL/EFI code-page jumper (J28 on the I/O board) and the Recovery program provided on the *Resource* CD that comes with the xSeries 450.

Complete the following steps to recover the SAL/EFI code.

1. Insert the *Resource* CD into the DVD/CD-RW drive.
2. Shut down the server; then, turn off the server.
3. Disconnect the cables and power cords from the rear of the server.

**Attention:** When you handle static-sensitive devices, take precautions to avoid damage from static electricity. See the documentation provided with the server for details about handling these devices.

4. Remove fans 3 and 4 from the I/O area.
5. Locate the SAL/EFI code-page jumper (J28) on the I/O board.



6. If there is a jumper on J28, move the jumper from pins 1-2 to pins 2-3 to enable the SAL/EFI backup code page. If there is no jumper, add one to J28 pins 2-3.
7. Replace fans 3 and 4.
8. Reconnect the cables and power cords to the rear of the server.
9. Restart the server. After 5-10 seconds, the blue Attention LED on the light path card will blink.
10. Within 2 minutes, the green Access LED on the DVD/CD-RW drive blinks several times, indicating that the recovery flash image is being read. If the LED does not blink, press the Reset button on the front panel of the server to restart the procedure.

If the LED still does not blink, you might need to have the I/O board replaced to correct the problem. Call for service.

11. When the DVD/CD-RW LED stops blinking, wait at least 5 minutes for the flash update to complete.
12. Remove the *Resource* CD from the drive.
13. Repeat steps 2 on page 12 through 5 on page 12. Then, continue with step 14.
14. Move the jumper on J28 to pins 1-2 to return to the normal start up mode.
15. Replace fans 3 and 4; then, close the covers.
16. Reconnect the cables and power cords to the rear of the server.
17. Restart the server.

**Note:** The SAL/EFI code recovery process is complete and the system should be functional. You also might need to update the SAL/EFI to the current level. See “Firmware updates” on page 9 for more information.

## Remote update of SAL/EFI code using the service processor might fail

**Description:** While updating the SAL/EFI code remotely using the service processor, the update might fail and the following message might appear in the error log: Flash of BIOS (I32) via LAN failed for USERID ... Failed due to incorrect checksum.

**Solution:** In the unlikely event that this problem occurs, retry the remote update.

---

## Keyboards

**Related topics:** “Remote console numeric keypad behaves unpredictably” on page 30.

The TrackPoint® keyboard is not supported on the xSeries 450 server.

## Integrated mouse does not work

**Description:** The integrated mouse on the TrackPoint keyboard does not work in the Extensible Firmware Interface (EFI).

**Solution:** The TrackPoint keyboard is not supported on the xSeries 450 server. If you want to use a mouse with the EFI, use a standard USB mouse.

## Repeat characters appear

**Description:** When using the Extensible Firmware Interface (EFI), the repeat-key sequence occasionally is initiated incorrectly.

**Solution:** In the unlikely event that this problem occurs, you can backspace over the repeated characters; then, type in the desired characters.

## Initial keystrokes not recognized

**Description:** If the keyboard remains idle for 30 minutes or longer when using the Extensible Firmware Interface (EFI), your initial keystrokes might not be recognized when you start typing again.

**Solution:** Type a few characters and the keyboard will respond properly.

---

## Light Path Diagnostics feature

You can use the Light Path Diagnostics panel to identify the possible cause of a problem. The Light Path Diagnostics panel is inside the drawer on the front right of the server. If the system-error LED on the front of the drawer is lit, press on the front of the drawer to open it and view the LEDs on the Light Path Diagnostics panel. Additional LEDs to help you isolate and identify a failing device are located on the top of the server, and on various boards and devices inside the server.

See the *IBM @server xSeries 450 Hardware Maintenance Manual and Troubleshooting Guide* for more detailed information.

---

## Memory

### DIMM installation

See the ServerProven<sup>®</sup> list at <http://www.ibm.com/pc/compat/> on the World Wide Web for a list of memory modules you can use with the xSeries 450.

Review the following guidelines before installing additional memory in the xSeries 450:

- The xSeries 450 supports 512 MB, 1 GB, and 2 GB DIMMs, for a maximum of 40 GB of system memory. The server supports 2.5 V, 184 pin, PC2100, ECC DDR SDRAM, 133 MHZ DIMMs.
- The xSeries 450 supports a maximum of 20 DIMMs (10 per port) if any connector contains a 2 GB DIMM.
- The xSeries 450 supports a maximum of 28 DIMMs (14 per port) if only 512 MB and 1 GB DIMMs are installed.
- The xSeries 450 comes with a minimum of two 512 MB DIMMs, installed in slots 1 and 14.
- When installing additional DIMMs, you must install two DIMMS at a time. Each DIMM in a pair must be of the same size and technology to ensure that the server will operate properly.
- When using memory mirroring, you must install two pairs of DIMMs at a time. The four DIMMs in each set must be identical.

Refer to the *IBM @server xSeries 450 Option Installation Guide* on the *IBM xSeries Documentation* CD for complete memory installation instructions.

### POST reports incorrect amount of installed memory

**Description:** POST reports less memory than the amount of memory installed in the server.

**Solution:** To correct or isolate the problem, do the following:

- Verify that the installed DIMMs are supported on the xSeries 450.
- Reseat the DIMMs and VRMs to ensure that they are properly installed and fully seated in the connectors.
- Using the Configuration/Setup utility, verify that the DIMM connectors are enabled.
- Ensure that the DIMM configuration of port 1 is identical to the DIMM configuration of port 2 before you enable memory mirroring. If the memory ports configurations are not identical when you enable memory mirroring, the system will disable the connectors associated with the unmatched DIMMS.

## Microprocessors

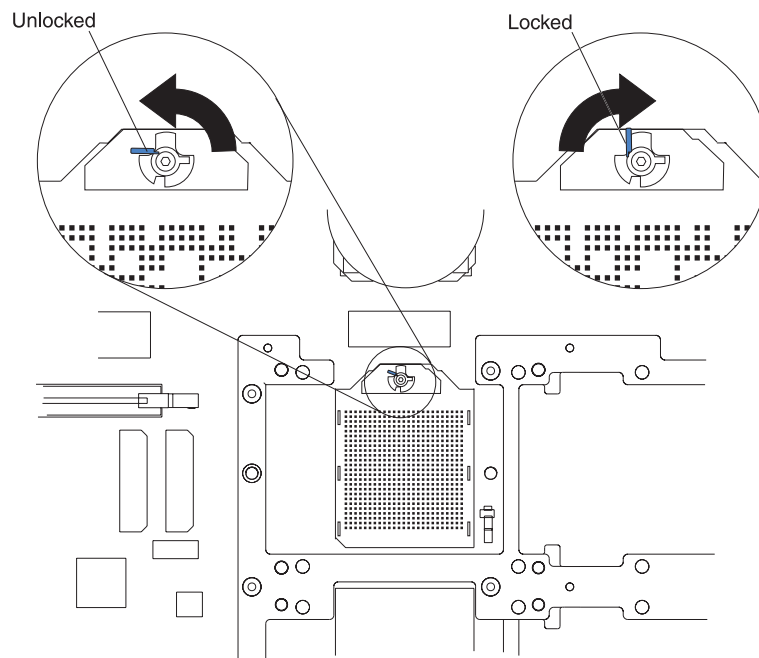
**Related topics:** “Microprocessors report soft corrected errors” on page 8.

### Microprocessor installation and replacement requirements

**Attention:** To avoid irreparable damage to the microprocessor, processor-board assembly, or other server components when you install additional microprocessors or replace existing microprocessors, observe the following guidelines:

- The socket for the Itanium microprocessor has a locking mechanism that is very difficult to see once the microprocessor assembly is in place. Before you attempt to seat a microprocessor in the socket, be sure to familiarize yourself with the socket locking mechanism. Use the hex wrench provided with the microprocessor option to lock and unlock the socket. As you rotate the hex wrench, observe the position of the locking flag. Also note the resistance of the locking mechanism when it is in the locked position. Forcing the locking mechanism beyond the locked position might damage the microprocessor socket.

**Note:** The use of a flashlight might improve the visibility of the locking flag.



- Follow the installation instructions provided with the microprocessor option verbatim. Failure to do so might result in damage to the server, the microprocessor, or both.
- Follow the microprocessor removal instructions provided with the microprocessor option and provided in the *xSeries 450 Hardware Maintenance Manual and Troubleshooting Guide*. Failure to do so might result in damage to the server, the microprocessor, or both.
- To ensure proper server operation, always install microprocessors that have the same cache size and type, and the same clock speed.

## Microprocessor testing

During startup, POST performs basic functionality tests on each installed microprocessor and each microprocessor performs its own built-in-self test (BIST). If you suspect that an installed microprocessor is failing, complete the following steps:

1. Shut down the server; then, turn off the server.
2. Restart the server.
3. Watch the monitor to see if POST reports any microprocessor errors.

---

## Operating systems

### Related topics:

- “Using the diskpart utility to partition a drive” on page 6.
- “Firmware updates and recovery process” on page 9.
- “PCI hot-plug features with the Linux operating system” on page 20.
- “Enabling Wake on LAN with Linux” on page 32.
- “Remote console numeric keypad behaves unpredictably” on page 30.

Instructions for installing an operating system on the server can be found at <http://www.ibm.com/pc/support/> on the World Wide Web. Each set of instructions specifies everything you need to perform the installation. Operating systems and versions that are officially supported for the xSeries 450 are listed on the ServerProven website at <http://www.ibm.com/pc/us/compat/> on the World Wide Web.

## Using the United Linux hwinfo and hwscan utilities

**Description:** The hwinfo and hwscan utilities provided in United Linux distributions are used to detect the system configuration and to maintain the SuSE hardware configuration database. Excessive use of these utilities can cause software failures (such as hung processes or system crashes) that might result in data corruption. Typically, these utilities run once during startup to perform a hardware scan and reconfiguration, or to configure hot-added hardware that requires configuration, or to create a detailed report of the system hardware and kernel configuration information.

Two specific problems, described below, are known to occur when running these utilities excessively. These problems are generic kernel bugs and they are not specific to SLES-8 or the United Linux kernel. Both problems can occur with SLES-8 or Red Hat Advanced Server 2.1 for IPF.

- IDE driver bug: This problem occurs when issuing specific control commands to an IDE device while the system is under relatively heavy load. A fix has been identified for this problem and a patch will be available when United Linux 1.0 Service Pack 1 for IPF is released. Red Hat currently has no plans to provide a kernel update to fix this problem until their third-quarter errata is available.
- Excessive loading and unloading of kernel modules: Running the hwscan utility with specific options, such as printer and storage--ctrl, causes process hangs and kernel panics due to the excessive loading and unloading of the device drivers. If you believe you are experiencing such a problem, examine the kernel log buffer to determine whether the kernel has faulted.

A typical backtrace might look similar to the following:

```
ia64_page_valid+0x70
statm_pgd_range+0x3a0
proc_pid_statm+0x410
proc_info_read+0xe0
sys_read+0x1c0
```

**Solution:** While the system is being used for normal operation, avoid running the `hwinfo` and `hwscan` utilities excessively, for example continuously in a script. In addition, avoid running any sequence of commands that would result in device drivers being loaded and unloaded multiple times while concurrently running any utility (such as `top`, `ps`, etc.) that might access specific process table attributes.

## Creating a CD from an ISO image when using SLES-8

If you are using the SLES-8 operating system, you can use the following instructions to create a CD from an ISO image; then, refer to the documentation provided with the ISO image for further instructions.

Complete the following steps to create the CD:

1. The Linux IDE ATAPI CD-ROM driver uses SCSI emulation for CD-ROM Read and Write operations. If a boot option to enable IDE-SCSI emulation was not included during the initial install process, you will need to add the boot option manually to the `elilo.conf` file. In most cases, the IDE DVD/CD-RW in the xSeries 450 will be the first IDE device. To enable the IDE-SCSI emulation, add the following boot option to the stanza for the kernel you are booting:

```
append="hda=ide-scsi"
```

For example, if your stanza appears as follows:

```
image=/vmlinuz
label=linux
root=802
initrd=/initrd
append="console=ttyS0,115200n8, console=tty0"
```

Once modified, your stanza would appear as follows:

```
image=/vmlinuz
label=linux
root=802
initrd=/initrd
append="console=ttyS0,115200n8, console=tty0 hda=ide-scsi"
```

2. Restart the system.
3. Run the following command to verify that the `ide-scsi` driver is loaded; then, review the list of modules currently loaded and look for `'ide-scsi'`.

```
# lsmod
```
4. If the `ide-scsi` driver is in the list, go to step 5. If the `ide-scsi` driver is not in the list, run the following command to manually load the `ide-scsi` driver:

```
# insmod ide-scsi
```
5. Run the following command to determine the SCSI bus (b), target (t), and lun (l) parameters for the DVD/CD-RW drive in the xSeries 450:

```
# cdrecord -scanbus
```

Data similar to the following will appear:

scsibus0:

```
0,0,0 0) 'IBM-ESXS' 'ST318305LC !#' 'B244' Disk
0,1,0 1) 'IBM-ESXS' 'ST318305LC !#' 'B244' Disk
0,2,0 2) *
0,3,0 3) *
0,4,0 4) *
0,5,0 5) *
0,6,0 6) *
0,7,0 7) *
0,8,0 8) 'IBM ' '25P3495a S320 1' '1 ' Processor
```

scsibus2:

```
2,0,0 200) 'HL-DT-ST' 'RW/DVD GCC-4160N' '0012' Removable CD-ROM
2,1,0 201) *
2,2,0 202) *
2,3,0 203) *
2,4,0 204) *
2,5,0 205) *
2,6,0 206) *
2,7,0 207) *
```

6. Insert a blank, writable CD into the DVD/CD-RW drive; then, run the following command to burn the CD from the ISO image:

```
# cdrecord -v dev=b,t,l <ISO-image-file>
```

where 'ISO-image-file' is the name of the ISO image file, 'b' is the SCSI bus, 't' is the SCSI target, and 'l' is the SCSI lun for your DVD/CD-RW device.

7. See the instructions provided with the ISO image to use the CD.



## PCI hot-plug expansion slots

**Related topics:** “PCI hot-plug features with the Linux operating system” on page 20.

The xSeries 450 has six hot-plug expansion slots on the PCI-X board. You can install 64-bit, 3.3 V and universal adapters in these PCI slots. (5.0 V adapters are not supported.)

- Video adapters are not supported.
- You can install both PCI and PCI-X adapters on the same bus. However, if you install a PCI adapter and a PCI-X adapter on the same bus, the PCI-X features of the PCI-X adapter will be disabled, and the adapter will function as a PCI adapter.
- You can install PCI or PCI-X adapters of speeds faster than what is labeled for a particular PCI-X bus. For example, if you install two 133 MHz adapters into slots that are labeled as 100 MHz slots, the adapters will operate at 100 MHz.
- If you install a 33 MHz and a 66 MHz adapter on the same bus, the bus speed will match that of the slowest adapter.
- Each expansion slot has a green Power LED and an amber Attention LED. The Attention LED is visible on the back of the server, but you must open the server cover if you want to view both LEDs. With the server cover open, you can use the light pipes located on the PCI-X dividers to view the LEDs.

Poor lighting and inconsistencies in the light-pipe material might impede the visibility of the LEDs. If you are not sure about the state of the LEDs, do not view them through the light pipes; instead, view them directly.

- The internal PCI scan order for the xSeries 450 is as follows: first the integrated devices are scanned; then, PCI slots 1, 2, 6, 5, 3, 4.

If an RXE-100 enclosure is attached to an xSeries 450, the scan order is as follows: first the integrated devices; then, PCI slots 1, 2, 6, 5, 3, 4; then, the RXE-100 PCI slots 11, 12, 9, 10, 7, 8, 17, 18, 15, 16, 13, and 14

See the following table for additional information about the expansion slots:

Slot	Bus <sup>1</sup>	Bus <sup>2</sup>	Supported adapter speed (MHz)
1	A	2	66
2	A	2	66
3	B	9	100 (133 if slot 4 is empty)
4	B	9	100 (133 if slot 3 is empty)
5	C	7	133
6	D	5	133

**Notes:**

1. The PCI bus letter designators appear in the documentation, on the system labels, and in some configuration utilities.
2. The PCI bus numeric designators might appear in some error logs and diagnostic programs.

---

## PCI hot-plug features with the Linux operating system

The SuSE Linux Enterprise Server 8 (SLES8) for the Itanium Processor Family (powered by United Linux 1.0) operating system does not build or load the PCI hot-plug driver by default. Use the instructions and information in the following sections to build the driver, load the driver, and use the PCI hot-plug features with the SLES8 operating system.

### Building the PCI hot-plug driver

1. The kernel-source RPM must be installed before you can build the driver. Run the following command to determine if the kernel-source RPM is installed:

```
# rpm -q kernel-source
```

2. If the kernel source is installed, go to step 4. Otherwise, continue with step 3.
3. Complete the following steps to install the kernel-source RPM:
  - a. Locate the United Linux for IPF CD 2 and insert it into the DVD/CD-RW drive on the xSeries 450.
  - b. Run the following command:

```
# yast2
```
  - c. Select **Software** → **Install or remove software**.
  - d. Select **Search** from the Filter menu and search for `kernel-source`.
  - e. Mark the kernel-source package for installation using the check box or the Actions menu.
  - f. Click **OK** or **Accept** and wait for the installation to complete.
  - g. Exit from `yast2`.
4. Complete the following steps to build the hot-plug driver (`acpiphp`):

**Note:** To build the `acpiphp` driver, you can copy the contents of the kernel-source directory (`/usr/src/linux--2.4.19.SuSE`) to a local subdirectory; or, you can build the driver directly from the kernel source directory.

- a. Copy the default kernel configuration file (`/boot/vmlinuz.config`) to the top-level directory containing the Linux kernel source; then, rename the configuration file from `vmlinuz.config` file to `.config`. For example, run the following commands:

```
# cd /usr/src/linux-2.4.19.SuSE
# cp /boot/vmlinuz.config .config
```

- b. From the top-level directory containing the kernel source, complete the following steps:
  - 1) Run the following command:

```
# make menuconfig
```
  - 2) Select **General setup** → **PCI Hotplug Support**.
  - 3) Move the cursor to ACPI PCI Hotplug driver and press **m** to build the driver as a loadable module.
  - 4) Exit the Menu program and answer **Yes** when prompted to save the kernel configuration.

- 5) Run the following command:
 

```
# make depend
```
- 6) Run the following command:
 

```
# make modules SUBDIRS=drivers/hotplug
```
5. Complete the following steps to install the acpihp driver:
  - a. From the top-level directory containing the kernel source, run the following command to copy the acpihp driver to the /lib/modules directory.
 

```
# cp drivers/hotplug/acpihp.o \
/lib/modules/2.4.19-SMP/kernel/drivers/hotplug
```
  - b. Run the following command:
 

```
# depmod
```
  - c. View the /lib/modules/2.4.19-SMP/modules.dep file and search for the pci\_hotplug entry; then, ensure that the following text was included in the file:
 

```
/lib/modules/2.4.19-SMP/kernel/drivers/hotplug/acpihp.o:
/lib/modules/2.4.19-SMP/kernel/drivers/hotplug/pci_hotplug.o
```

## Loading the PCI hot-plug driver

1. Run the following command to load the pci\_hotplug and acpihp drivers:
 

```
# modprobe acpihp
```
2. Run the following command to verify that both the pci\_hotplug and acpihp modules are loaded:
 

```
# lsmod
```
3. Run the following command to mount the PCI hot-plug file system:
 

```
# mount -t pcihpfs none /proc/bus/pci/slots
```

**Note:** A subdirectory for each hot-plug PCI slot now exists in the /proc/bus/pci/slots directory.

## Installing a hot-plug PCI adapter

Refer to the information provided with the xSeries 450 and the following instructions to install a hot-plug PCI adapter in an empty slot.

**Note:** You must log in as root to issue hot-plug commands.

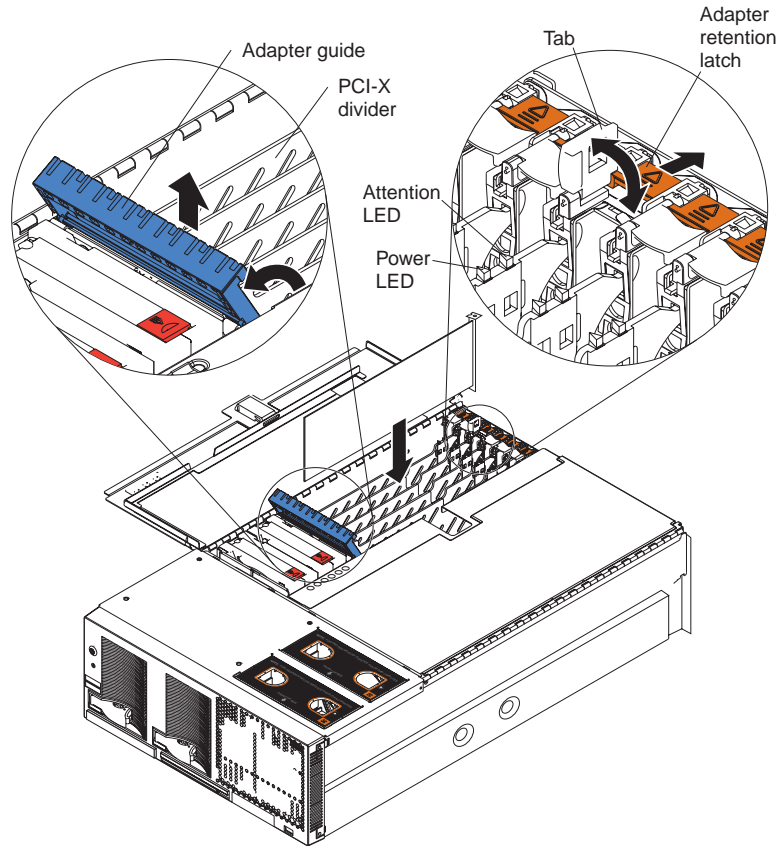
1. Run the following command and examine the output to verify that the pci\_hotplug and acpihp drivers are loaded:
 

```
# lsmod
```
2. Run the following command and examine the output to verify that the PCI hot-plug file system is mounted:
 

```
# mount
```
3. Save a listing of the PCI devices currently installed. For example, run the following command:
 

```
# lspci > /tmp/lspci$$$.out1
```

- Slide the adapter-retention latch while lifting the tab for an empty PCI slot.



- Install the new PCI adapter:
  - If you are installing a full-length adapter, open the blue adapter guide by lifting the front edge, as shown in the illustration.
  - Carefully grasp the adapter by its top edge or upper corners, and align it with the connector on the PCI-X board.
  - Press the adapter *firmly* into the adapter connector.  
**Attention:** When you install an adapter, be sure the adapter is correctly seated in the connector. Improperly seated adapters might cause damage to the PCI-X board or to the adapter.
  - Connect the cables for the adapter, if required.
  - Push down on the blue adapter guide to keep the adapter steady.
  - Close the tab; then, ensure that the adapter-retention latch clicks into place, securing the adapter.
- Verify that the green Power LED next to the slot in which you just installed the adapter is now lit.
- Save an updated listing of the installed PCI devices. For example, run the following command:

```
# lspci > /tmp/lspci$$$.out2
```
- Compare the before and after installation listings to confirm that the new PCI adapter was detected, and to determine the bus and slot numbers where it is installed. For example, run the following command:

```
# diff /tmp/lspci$$$.out1 /tmp/lspci.out2
```

9. Change to the directory (within /proc/bus/pci/slots) for the PCI slot identified by <busnum>:<slotnum> in step 8 on page 22. For example, run the following command:  

```
# cd /proc/bus/pci/slots/ACPI*-<busnum>:<slotnum>
```
10. Run the following command to verify that the power file contains a value of “1”, which indicates that the PCI slot power is turned on:  

```
# cat power
```

The new PCI adapter is now available for use.

## Removing a hot-plug PCI adapter

Refer to the information provided with the xSeries 450 and the following instructions to remove an existing hot-plug PCI adapter.

**Note:** You must log in as root to issue hot-plug commands.

1. Run the following command and examine the output to verify that the pci\_hotplug and acpihp drivers are loaded:  

```
# lsmod
```
2. Run the following command and examine the output to verify that the PCI hot-plug file system is mounted:  

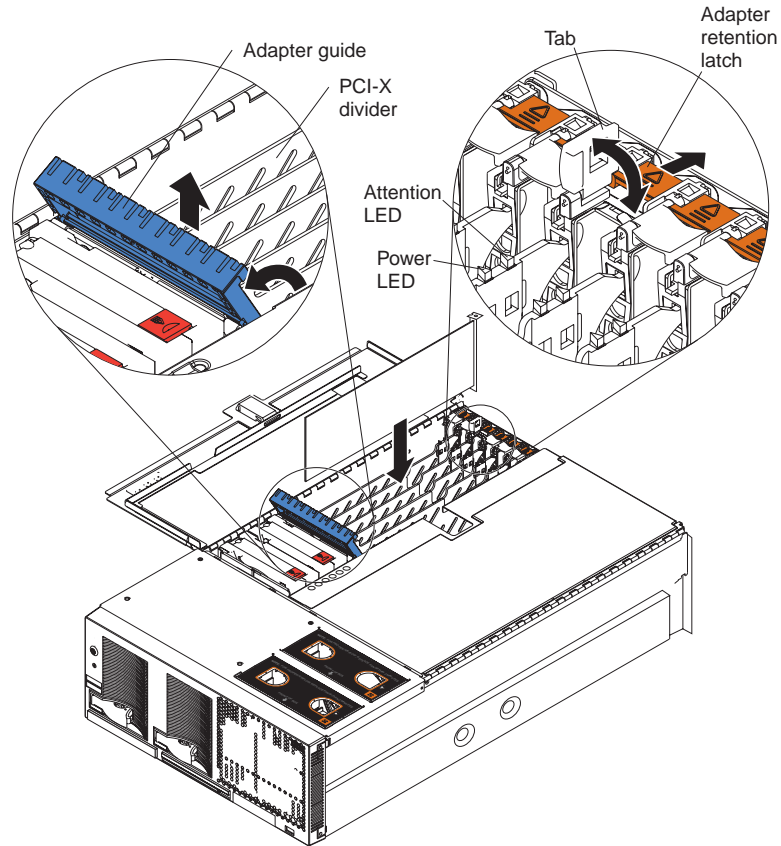
```
# mount
```
3. Run the following command and examine the output to determine the bus and slot numbers for the existing PCI adapter:  

```
# lspci
```
4. Run the following command to confirm that the output shows the PCI adapter you want to remove:  

```
# lspci -s <busnum>:<slotnum>
```
5. Change to the directory (within /proc/bus/pci/slots) for the PCI slot identified by <busnum>:<slotnum> in step 4. For example, run the following command:  

```
# cd /proc/bus/pci/slots/ACPI*-<busnum>:<slotnum>
```

6. Verify that the green Power LED next to each populated slot is lit.



7. Run the following command to verify that the power file contains a value of “1”, which indicates that the PCI slot power is turned on:  

```
# cat power
```
8. Run the following command to turn off the PCI slot power:  

```
# echo 0 > power
```
9. Run the following command to verify that the power file contains a value of “0”, which indicates that the PCI slot power is turned off:  

```
# cat power
```
10. Verify that the amber Attention LED next to the slot that was powered off is lit and the green Power LED is off.
11. Run the following command to verify that the output no longer shows the PCI adapter you want to remove:  

```
# lspci -s <busnum>:<slotnum>
```
12. If cables are attached to the adapter you are removing, disconnect the cables and remove them from the server.
13. Slide the adapter-retention latch while lifting the tab; then, remove the PCI adapter.
14. Close the tab; then, ensure that the adapter-retention latch clicks into place.

## Replacing a hot-plug PCI adapter

Refer to the information provided with the xSeries 450 and the following instructions to replace an existing hot-plug PCI adapter.

**Note:** You must log in as root to issue hot-plug commands.

1. Run the following command and examine the output to verify that the `pci_hotplug` and `acpiphp` drivers are loaded:  

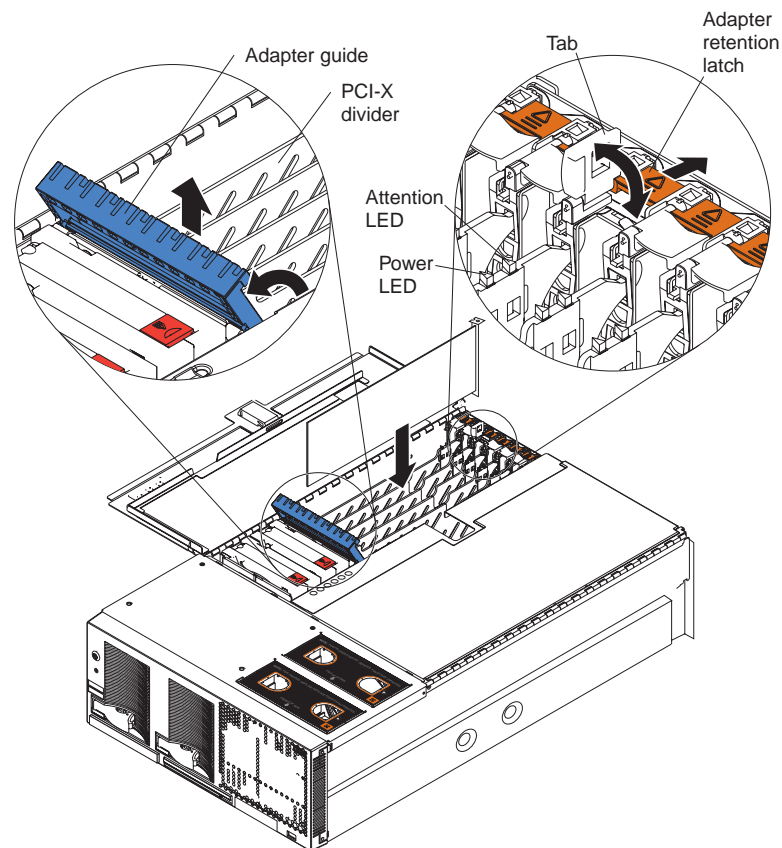
```
# lsmod
```
2. Run the following command and examine the output to verify that the PCI hot-plug file system is mounted:  

```
# mount
```
3. Run the following command and examine the output to determine the bus and slot numbers for the existing PCI adapter:  

```
# lspci
```
4. Run the following command to confirm that the output shows the PCI adapter you want to replace:  

```
# lspci -s <busnum>:<slotnum>
```
5. Change to the directory (within `/proc/bus/pci/slots`) for the PCI slot identified by `<busnum>:<slotnum>` in step 4. For example, run the following command:  

```
# cd /proc/bus/pci/slots/ACPI*-<busnum>:<slotnum>
```
6. Verify that the green Power LED next to each populated slot is lit.



7. Run the following command to verify that the power file contains a value of "1", which indicates that the PCI slot power is turned on:  

```
# cat power
```

8. Run the following command to turn off the PCI slot power:  

```
# echo 0 > power
```
9. Run the following command to verify that the power file contains a value of “0”, which indicates that the PCI slot power is turned off:  

```
# cat power
```
10. Verify that the amber Attention LED next to the slot that was powered off is lit and the green Power LED is off.
11. Run the following command to verify that the output no longer shows the PCI adapter you want to replace:  

```
# lspci -s <busnum>:<slotnum>
```
12. If cables are attached to the adapter you are replacing, disconnect the cables and remove them from the server.
13. Slide the adapter-retention latch while lifting the tab; then, remove the existing PCI adapter.
14. Install the new PCI adapter:
  - a. If you are installing a full-length adapter, open the blue adapter guide by lifting the front edge, as shown in the illustration.
  - b. Carefully grasp the adapter by its top edge or upper corners, and align it with the connector on the PCI-X board.
  - c. Press the adapter *firmly* into the adapter connector.  
**Attention:** When you install an adapter, be sure the adapter is correctly seated in the connector. Improperly seated adapters might cause damage to the PCI-X board or to the adapter.
  - d. Connect the cables for the adapter, if required.
  - e. Push down on the blue adapter guide to keep the adapter steady.
  - f. Close the tab; then, ensure that the adapter-retention latch clicks into place, securing the adapter.
15. Verify that the green Power LED is now lit, and the amber Attention LED is off.
16. Run the following command to verify that the output shows the new PCI adapter:  

```
# lspci -s <busnum>:<slotnum>
```
17. Run the following command to verify that the power file contains a value of “1”, which indicates that the PCI slot power is turned on:  

```
# cat power
```

The new PCI adapter is now available for use.



## Using the PCI hot-plug GUI

You can use the open-source PCI hot-plug graphical user interface (GUI) application (pcihpview) to perform hot-plug operations and to view the status of each of the PCI slots.

You can obtain a copy of the pcihpview application at <http://www.ibiblio.org/pub/linux/X11/xutils> on the World Wide Web. The instructions for building the pcihpview GUI are included in the compressed image.

Complete the following steps to perform a hot-plug operation using the GUI:

1. Ensure that the PCI hot-plug drivers and pcihpfs file system are loaded (see “Loading the PCI hot-plug driver” on page 21); then, run the following command to launch the GUI:

```
# pcihpview
```

2. Using the left-mouse button, highlight the slot description for the adapter you plan to replace.
3. Press the right-mouse button to invoke the pop-up menu; then from the pop-up menu, select **Power Off**.
4. Verify that the amber Attention LED next to the slot that was powered off is lit and the green Power LED is off.
5. If cables are attached to the adapter you are replacing, disconnect the cables and remove them from the server.
6. Slide the adapter-retention latch while lifting the tab; then, remove the existing PCI adapter.
7. Install the new PCI adapter:
  - a. If you are installing a full-length adapter, open the blue adapter guide by lifting the front edge.
  - b. Carefully grasp the adapter by its top edge or upper corners, and align it with the connector on the PCI-X board.
  - c. Press the adapter firmly into the adapter connector.

**Attention:** When you install an adapter, be sure the adapter is correctly seated in the connector. Improperly seated adapters might cause damage to the PCI-X board or to the adapter.
  - d. Connect the cables for the adapter, if required.
  - e. Push down on the blue adapter guide to keep the adapter steady.
  - f. Close the tab; then, ensure that the adapter-retention latch clicks into place, securing the adapter.
8. Verify that the green Power LED is now lit, and the amber Attention LED is off.
9. Using the GUI, verify that the new adapter is present.

---

## Power supplies

The xSeries 450 comes with two power supplies, each providing 550 watts at 100-127 V ac or 1050 watts at 200-240 V ac. The power supplies are hot-swappable and redundant at 200-240 V ac only. Both power supplies must be connected to the power source for operation at 100-127 V ac.

The xSeries 450 also comes with two power cords. The power cords can be connected to an external source, such as a properly grounded electrical outlet, or to a primary power unit inside the rack cabinet, such as a properly grounded power distribution unit or uninterruptible power supply.

**Attention:** During normal operation, always ensure that both power supplies are installed, and that both power cords are plugged into the power supplies and into an ac power source. Failure to do so might cause system errors. For example, the system might hang during startup.

---

## Remote Supervisor Adapter

**Related topics:**

- “Error messages and indicators” on page 7.
- “Firmware updates” on page 9.
- “Remote update of SAL/EFI code using the service processor might fail” on page 13.

## Replacing the Remote Supervisor Adapter

The Extensible Firmware Interface (EFI) in the xSeries 450 stores its variables with nonvolatile attributes in NVRAM on the Remote Supervisor Adapter. Before you remove or replace the Remote Supervisor Adapter or clear the NVRAM, be sure to make a backup copy of the nonvolatile EFI variables. After you install a new Remote Supervisor Adapter, you must restore the EFI variables previously stored in NVRAM.

The EFI variables stored in NVRAM on the Remote Supervisor Adapter include the following:

- Console definitions
- Boot options / Drivers
- Boot order / Timeout

You can use the xSeries 450 Backup and Restore utilities to backup or restore the nonvolatile EFI variables stored in NVRAM. These utilities are included in the most current version of the System Abstraction Layer Extensible Firmware Interface (SAL/EFI) code. See “Creating a backup copy of the nonvolatile EFI variables” on page 29 and “Restoring the nonvolatile EFI variables” on page 29 for instructions.

## Creating a backup copy of the nonvolatile EFI variables

Complete the following steps to create a backup copy of the EFI variables:

1. Ensure that the formatted media where you plan to store the backup file is installed.
2. Start the server.
3. Select **EFI shell** from the EFI Boot Manager startup options.

**Note:** If EFI shell is not a choice on the list, the server has a customized startup configuration. Contact the System Administrator for further instructions.

4. Change to the file system for the formatted media where you want to store the backup copy.
5. Type the following EFI command to create a backup copy of the EFI variables:  
`backup filename`

Where *filename* is the eight-character name you want to assign to the backup copy (for example, efibckup.001).

6. Type one of the following EFI commands to verify that the backup file was created successfully:  
`dir` or `ls`

The backup procedure is now completed.

## Restoring the nonvolatile EFI variables

Complete the following steps to restore the nonvolatile EFI variable settings:

1. Ensure that the formatted media that contains the backup copy of the EFI variables is installed.
2. Start the server.
3. Select **EFI shell** from the EFI Boot Manager startup options.

**Note:** If EFI shell is not a choice on the list, the server has a customized startup configuration. Contact the System Administrator for further instructions.

4. Change to the file system that contains the backup copy of the EFI variables.
5. Type one of the following EFI commands to verify that the backup file exists:  
`dir` or `ls`
6. Type the following EFI command to restore the EFI variables:  
`restore filename`

Where *filename* is the name you assigned to the backup copy.

7. When the message Delete existing non-volatile efi variables? [y/n] appears, type:  
`y`
8. Type the following EFI command to reset the system:  
`reset`

The restore procedure is now completed.

## Remote video graphics look incomplete when using Linux

**Description:** In 64-bit Linux operating systems, the color of remote-graphic images appears incomplete. All colors will not appear when using screen resolution settings of 256 colors in the 8-bit mode.

**Solution:** A future release of Remote Supervisor Adapter firmware will correct this problem. Use the 16-bit or 65535 color mode until the firmware update becomes available.

## Remote console numeric keypad behaves unpredictably

**Description:** The symptoms vary depending on the operating system in use:

- Windows Server 2003: The num-lock button bar icon has no effect on the signals sent to the server from the numeric-keypad keys of the client. The numeric keypad behavior is controlled solely by the num-lock key on the client keyboard.
- SuSE Linux Enterprise Server 8 (SLES-8): When the num-lock function is turned on at both the client and server, numeric characters are sent when you press the keys on the numeric keypad. Otherwise, the action signals (Home, PgUp, etc.) are sent.
- Red Hat Advanced Server 2.1 for IPF: When the num-lock function is turned on at both the client and server, incorrect characters are sent when you press the keys on the numeric keypad. Otherwise, the action signals (home, PgUp, etc.) are sent.

**Solution:** Avoid using the numeric keypad when running any version of Linux. Instead, use the regular keyboard keys. You can use the numeric keypad when running Windows, but only the num-lock state at the client has any effect.

## System Health web page lists Intelligent I/O Expansion Unit fan failures

**Description:** The Remote Supervisor Adapter System Health web page might list Intelligent I/O Expansion Unit fan failures for either Side A or Side B. All fans in the Intelligent I/O Expansion Unit are shared between Side A and Side B. The Remote Supervisor Adapter System Health web page can list an Intelligent I/O Expansion Unit fan failure as being detected by Side A when the system event log lists the same fan failure as being detected by Side B.

**Solution:** The referenced fan is the same regardless of whether the fault was detected by Side A or Side B. Replace the fan if it is failing.

---

## Resource CD

**Related topics:**

- “Device drivers” on page 5.
- “Firmware updates and recovery process” on page 9.

The *Resource* CD contains device drivers, Ethernet diagnostic code, operating system installation information, and the xSeries 450 SAL/EFI recovery code and instructions.

**Note:** You can download the latest device drivers and other code updates from the World Wide Web. Go to <http://www.ibm.com/eserver/xseries/>, click IBM Server Support, and make the selections for the server.

The *Resource* CD contains the following:

- Device drivers for the following:
  - Ethernet device driver for Windows Server 2003
  - Debug port and debug support
- Broadcom Ethernet diagnostic code
- Operating system installation information
- SAL/EFI recovery code
  - SAL/EFI recovery instructions
  - Information regarding the EFI disk utilities

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## Supported options

For a list of supported options for the xSeries 450 server, go to <http://www.ibm.com/pc/us/compat/> on the World Wide Web.

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## Support telephone numbers

View support telephone numbers at <http://www.ibm.com/planetwide/> on the World Wide Web.

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## Troubleshooting

**Related topics:**

- “Cursor disappears after exiting LSI utility” on page 5.
- “Error messages and indicators” on page 7.
- “Messages appear after a service processor flash update” on page 7.
- “Service processor logs system complex powered up and down messages during a system reset” on page 8.
- “Microprocessors report soft corrected errors” on page 8.
- “Integrated mouse does not work” on page 13.
- “Repeat characters appear” on page 13.
- “Initial keystrokes not recognized” on page 13.
- “Light Path Diagnostics feature” on page 14.
- “POST reports incorrect amount of installed memory” on page 14.
- “Improper server shutdown disables Wake on LAN” on page 32.

---

## Wake on LAN

### Enabling Wake on LAN with Linux

The default setting for the Wake on LAN (WOL) function in some Ethernet device drivers is set to disabled. If you are using a Linux operating system, such as SuSE Linux Enterprise Server 8 (SLES8) for the Itanium Processor Family (powered by United Linux 1.0) or Red Hat Advanced Server 2.1 for IPF, you can use the `ethtool` to enable the WOL functionality.

1. Run the following command to determine if WOL is enabled for a specific Ethernet interface:

```
# ethtool ethX
```

where X is the Ethernet interface number.

If the `ethtool` command returns a “No data available” message, the Ethernet device driver does not support the `ethtool` software interface. If the Ethernet device driver supports the `ethtool` software interface, data regarding various Ethernet adapter settings will be displayed.

The **Supports Wake-on** entry indicates whether the Ethernet controller supports WOL. The **Wake-on** entry indicates whether the WOL function is enabled or disabled. A “d” indicates that the WOL function is disabled. A “g” indicates that the WOL Magic Packet is enabled.

2. Run the following command to enable the WOL Magic Packet:

```
# ethtool -s ethX wol g
```

After you run the command in step 2, the WOL function will be enabled for the Ethernet adapter associated with `ethX`. (See the `ethtool(8)` man page for more information.)

### Improper server shutdown disables Wake on LAN

**Description:** Improper shutdown of a server will not allow that server to restart using the Wake on LAN feature. An improper shutdown occurs when the system power is turned off by pressing and holding the power button on the server front panel while the operating system is running, or while the Extensible Firmware Interface (EFI) is loading.

**Solution:** There are two ways to re-enable the Wake on LAN feature:

- Turn off the ac power; then, turn on the ac power.
- or
- Perform a proper server shutdown; then, press the button on the server front panel to turn on the system.

---

## Chapter 3. Getting help and technical assistance

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

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### Before you call

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

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM Support Web site at <http://www.ibm.com/pc/support/> to check for technical information, hints, tips, and new device drivers.
- Use an IBM discussion forum on the IBM Web site to ask questions.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most xSeries and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

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### Using the documentation

Information about your IBM xSeries or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, README files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/pc/support/> and follow the instructions. Also, you can order publications through the IBM Publications Ordering System at <http://www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi>

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### Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM xSeries and IntelliStation products, services, and support. The address for IBM xSeries information is <http://www.ibm.com/eserver/xseries/>. The address for IBM IntelliStation information is <http://www.ibm.com/pc/intellistation/>.

You can find service information for your IBM products, including supported options, at <http://www.ibm.com/pc/support/>. If you click **Profile** from the support page, you can create a customized support page. The support page has many sources of information and ways for you to solve problems, including:

- Diagnosing problems, using the IBM Online Assistant
- Downloading the latest device drivers and updates for your products
- Viewing Frequently Asked Questions (FAQ)
- Viewing hints and tips to help you solve problems
- Participating in IBM discussion forums
- Setting up e-mail notification of technical updates about your products

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## Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, go to <http://www.ibm.com/services/sl/products/>.

For more information about Support Line and other IBM services, go to <http://www.ibm.com/services/> , or go to <http://www.ibm.com/planetwide/> for support telephone numbers.

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## Hardware service and support

You can receive hardware service through IBM Integrated Technology Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. Go to <http://www.ibm.com/planetwide/> for support telephone numbers.

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



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## Important notes

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

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

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

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

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

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

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Part Number: 90P0408

Printed in U.S.A.

(1P) P/N: 90P0408

