



Operation and Maintenance Guide

HP Integrity rx2600 server and HP workstation
zx6000

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September 2003

This manual contains an overview of system specifications, instructions for removing and replacing system components, information on configuring your system using the included tools and interfaces, and detailed troubleshooting information.

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WARNING: Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

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Important Safety Warnings



WARNING: *Avoid electrical shocks.* To avoid electrical shock, do not open the power supplies. There are no user-serviceable parts inside.

To avoid electrical shock and harm to your eyes by laser light, do not open the DVD laser module. The laser module should be serviced by service personnel only. Do not attempt to make any adjustment to the laser unit. Refer to the label on the DVD for power requirements and wavelength. This product is a class I laser product.



WARNING: *Removing and Replacing the Cover.* For your safety, never remove the system side cover without first disconnecting the power cord from the power outlet and removing any connection to a telecommunications network. If a Power Protection Device is fitted to your system, you must shut down your computer using its on/off switch, then remove the power cord before removing the system's side cover. Remove the Power Protection Device cables before any servicing operation. Always replace the side cover before switching the system on again.



WARNING: *Battery Safety Information.* There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn an old battery. Replace the battery with the same or equivalent type, as recommended by the manufacturer.

The battery in this system is a lithium battery that does not contain any heavy metals. However, to protect the environment, do not dispose of batteries in household waste. Return used batteries either to the shop from which you bought them, to the dealer from whom you purchased your system, or to HP so that they can either be recycled or disposed of in the correct way. Returned batteries will be accepted free of charge.



WARNING: *Avoid Burn Injuries.* Some parts inside the computer will be hot. Wait approximately three to five minutes for them to cool down before touching them.



CAUTION: *Avoid Static Electricity.* Static electricity can damage electronic components. Turn OFF all equipment before installing an accessory card. Don't let your clothes touch any accessory card. To equalize the static electricity when replacing an accessory card, rest the accessory card bag on top of the system unit while you are removing the card from the bag. Handle the card as little as possible and with care.



CAUTION: *Information on Ergonomic Issues.* It is strongly recommended that you read the ergonomics information, available in the "Working In Comfort" section of this manual, before using your system. You can access more extensive ergonomics information at: www.hp.com/ergo

NOTE: *Recycling your system.* HP has a strong commitment toward the environment. Your HP system has been designed to respect the environment as much as possible. HP can also take back your old system for recycling when it reaches the end of its useful life. HP has a product take-back program in several countries. The collected equipment is sent to an HP recycling facilities in Europe or the U.S.A. As many parts as possible are reused. The remainder is recycled. Special care is taken for batteries and other potential toxic substances, these are reduced into non-harmful components through special chemical processes. If you require more details about the HP product take-back program, contact your local dealer or your nearest HP Sales Office.

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Product Overview

This chapter provides an overview of your system:

- system configurations
- system features
- physical characteristics
- power specifications
- environmental specifications
- front panel
- rear panel

System Configurations

The HP Integrity rx2600 server and HP workstation zx6000 are available in *tower* and *rack-mount* configurations

Configuration	Accessory slots	Fan Type/Speed	Management Processor	Redundant Hot-swap Power Supply
zx6000 workstation Tower	3 PCI 1 AGP	Quiet/ Low	No	No
zx6000 workstation Rack-mount	3 PCI 1 AGP	Hi Capacity/ High	Optional	Optional
Integrity rx2600 server Tower	4 PCI	Hi Capacity/ High	Yes	Yes
Integrity rx2600 server Rack-mount	4 PCI	Hi Capacity/ High	Yes	Yes

System Features

The rx2600 and zx6000 are available in many configurations. The table below provides an overview of the system features.

- For a complete and current list of supported parts, components, and accessories, see:
 - <http://partsurfer.hp.com>**
- For information on the specific features and components of your system:
 - ❑ On systems with *firmware revision 1.9 or lower*, use the EFI **info** command. See “Configuration Commands” on page 3-7.
 - ❑ On systems with *firmware revision 2.0 or higher*, see “Advanced System Configuration Menu” on page 3-23.

Feature	Description
Processor(s)	Single or dual-processor <ul style="list-style-type: none"> • Intel® Itanium® 2 processor: <ul style="list-style-type: none"> • 900 MHz with 1.5 MB cache on chip • 1 GHz with 3 MB cache on chip • 1.3 GHz with 3 MB cache on chip • 1.5 GHz with 6 MB cache on chip
Firmware	8 MB flash EEPROM Configured using Extensible Firmware Interface (EFI)
Operating system	Red Hat® Linux® Advanced Workstation 2.1 for the Itanium® Processor HP-UX 11i v2 Microsoft® Windows®: <ul style="list-style-type: none"> • XP 64-Bit Edition Version 2003 (zx6000 workstation) • Server 2003, Enterprise Edition (Integrity rx2600 server)
Main memory	Capacity: <ul style="list-style-type: none"> • zx6000 workstation: 512 MB min.(2 x 256 MB) • Integrity rx2600 server: 1 GB min. (4 x 256 MB) • 24 GB max. Type: PC2100 ECC registered DDR266 SDRAM Slots: Twelve DIMM slots Modules supported: 256MB, 512MB, 1GB, 2 GB Bus Bandwidth: up to 8.5 GB/s NOTE: For memory loading order and detailed memory installation, see page 2-24.

Feature	Description
Hard drives	Internal bays: 3 hot-plug SCSI disk bays Hard disk drives supported: <ul style="list-style-type: none"> • 36 GB (10k or 15k rpm) • 73 GB (15k rpm) • 146 GB (10k rpm) Maximum internal storage: 438 GB
Optical drives	1 open bay for 8x slimline DVD-ROM or CD-RW/DVD-ROM
SCSI controller	Two Ultra 320 SCSI channels One external SCSI port (rear panel): <ul style="list-style-type: none"> • 68-pin standard, high density SCSI connector • Must use cables designated as U320-capable with U320 devices • 12 m maximum bus length • SCSI ID: <ul style="list-style-type: none"> • may not use SCSI ID 2 when a drive is installed in internal bay 2 • may use SCSI ID 2 for the external port if there is no drive in bay 2 • Termination: <ul style="list-style-type: none"> • must be terminated if there are devices attached • must not be terminated if no devices are attached (automatically terminates if no devices are attached) • Device support: <ul style="list-style-type: none"> • LVD devices • Legacy SE devices • SE, narrow devices
IDE controller	Ultra ATA-100 capable controller Supports one IDE optical drive (CD/DVD)
Graphics controllers	zx6000 workstation supports one of the following options: <ul style="list-style-type: none"> • AGP graphics card (see Appendix A) • Management Processor (MP) card VGA port Integrity rx2600 server: <ul style="list-style-type: none"> • Management Processor (MP) card VGA port

Feature	Description
Accessory card slots	zx6000 workstation: <ul style="list-style-type: none">• One AGP Pro 4× 32-bit slot supporting 1.5V AGP cards• Three 64-bit 133 MHz Peripheral Component Interconnect (PCI-X 1.0) slots, supporting all bridges and multifunction PCI-X devices; all three PCI-X slots comply with PCI-X 1.0 specification Integrity rx2600 server: <ul style="list-style-type: none">• Four 64-bit 133 MHz Peripheral Component Interconnect (PCI-X 1.0) slots
Management Processor card (standard on Integrity rx2600 server, optional on zx6000 workstation)	25-pin serial connector (with console/remote/USP extensions; requires breakout cable) 10/100 BT Management LAN 15-pin VGA connector <ul style="list-style-type: none">• The graphics display port functionality on the HP Management Processor Card is not supported on zx6000 workstations with an AGP graphics card installed; all other HP Management Processor Card functionality is supported
Rear connectors (labeled)	Four USB connectors: <ul style="list-style-type: none">• High speed 480 Mb/sec. capable• Full speed 12 Mb/sec. and low speed 1.5 Mb/sec.• HP-UX supports HP USB keyboard and mouse• Linux supports all 1.1 USB devices• Windows supports USB keyboard and mouse, as well as other USB devices with driver support Two 9-pin serial ports: <ul style="list-style-type: none">• UART 16550 buffered• RS-232-C External 68-pin LVDS/SE SCSI connector (see SCSI controller above)
LAN connectors	<ul style="list-style-type: none">• 10/100 BT Management LAN• 10/100/1000 BT Gigabit LAN• 10/100 BT MP Card LAN (on systems with MP card)

Physical Characteristics

Standard configuration as shipped, excluding keyboard and monitor.

Weight:

- | | |
|---------------------|--|
| • Tower system | Min: 22.4 kg (49.4 lb.)
Max: 25.5 kg (56.3 lb.) |
| • Rack-mount system | Min: 17.5 kg (38.6 lb.)
Max: 22.2 kg (49.0 lb.) |

Dimensions (DxWxH):

- | | |
|---------------------|---|
| • Tower system | 67.5 cm (26.6 in.) x 29.5 cm (11.6 in.) x 49.4 cm (19.5 in.) |
| • Rack-mount system | 67.9 cm (26.8 in.) max. x 48.3 cm (19.0 in.) x 8.6 cm (3.4 in.) |

Footprint (tower)	0.2 m ² (2.1 sq. ft.)
Rack units (rack-mount)	2U

Power Specifications

Power specifications are based on systems with one *or* two power supplies installed.

Parameter	Total Rating	Peak (15 sec.)	Max. per PCI-X Slots 64-bit, 133MHz	Maximum for AGP Slot Standard Connector
Input voltage	100-127 VAC 200-250 VAC	N/A	N/A	N/A
Input frequency	50 to 60 Hz	N/A	N/A	N/A
Maximum input current ¹	7.2A 3.6A	N/A	N/A	N/A
Maximum output power ²	600W	N/A	85W total for PCI slots and AGP slot	
Max current at +12V	49A	N/A	0.5A	4.8A
Max current at -12V	0.35A	N/A	0.1A	N/A
Max current at +3.3V	34A	N/A	4.6A	12.1A
Max current at +5V	18A	31A	3A	2A
Max current at +3.3V stdby	3.5A	N/A	N/A	N/A

1. Corresponds to the maximum DC power the power supply can provide to the system.

2. The worst case/highest current given the lowest input voltage and the maximum input power.

If an overload triggers the power supply overload protection, the system is immediately powered off. To reset the power supply unit:

1. Disconnect the power cord.
2. Determine what caused the overload by contacting an HP support representative.
3. Reconnect the power cord, then reboot the system.

If an overload occurs twice, there is an undetected short circuit somewhere.

When you use the front panel power button to turn off the system, power consumption falls below the low power consumption but doesn't reach zero. To reach zero power consumption in "off" mode, either unplug the system or use a power block with a switch.

Power Consumption and Cooling

The power consumptions listed in the following table are valid for a standard configuration as shipped (one 1 GHz processor, 6 GB of memory, 600W power supply, three hard disk drives, one graphics card, one LVD SCSI card).

All information in this section is based on primary power consumptions with one power supply installed.

Additional Component	Power Consumption	
• Processor	130W	443.6 Btu/h
• SCSI hard disk drive (with I/O access)	23W	78.4 Btu/h
• SCSI hard disk (idle)	16W	54.5 Btu/h
• PCI card	10W to 25W	34.12 Btu/h to 85.30 Btu/h
• AGP card	70W	238.4 Btu/h

Environmental Specifications

Operating temperature and humidity ranges may vary depending on the installed mass storage devices. High humidity levels can cause improper disk operation. Low humidity levels can aggravate static electricity problems and cause excessive wear of the disk surface.

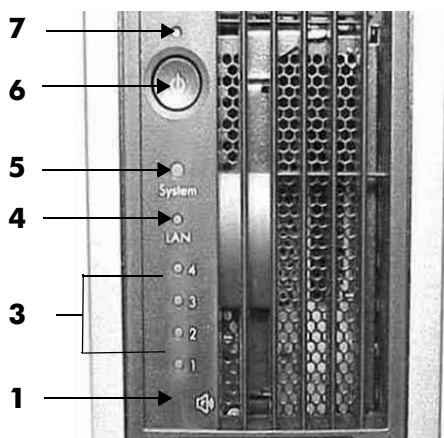
Environmental specifications (system processing unit with hard disk)	
Operating temperature	+5° C to +35° C (+41° F to +95° F)
Storage temperature	-40° C to +70° C (-40° F to +158° F)
Over-temperature shutdown	+40° C (+104° F)
Operating humidity	15% to 80% relative (noncondensing)
Storage humidity	8% to 85% relative (noncondensing)
Acoustic noise emission (ISO 7779)	Sound power level ³
Tower System:	
• Typical configuration ¹ (disk idle)	LwA ⁴ =5.1 BA
• Maximum configuration ² (disk idle)	LwA =5.4 BA
• Maximum configuration ² (disk active)	LwA =6.2 BA
Rack System:	
• Typical configuration ¹ (disk idle)	LwA =6.4 BA
• Maximum configuration ² (disk idle)	LwA =6.4 BA
• Maximum configuration ² (disk active)	LwA =7.2 BA
Operating altitude	3048 m (10,000 ft.) max
Storage altitude	4600 m (15,000 ft.) max

1. Single processor, one to two SCSI hard disk drives and less than 8 GB of memory
2. Dual processor, one to two SCSI hard disk drives and less than 8 GB of memory
3. Typical configuration at room temperature (25° C)
4. LwA = A-weighted sound power level in dB(A)

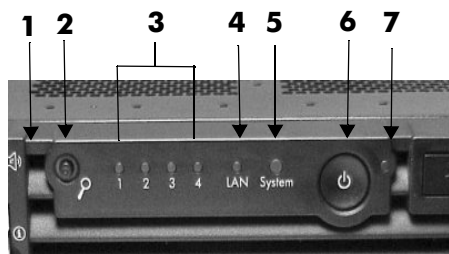
Front Panel

The front panels of the rx2600 and zx6000 have the following features:

- **Power LED** is green when the power is on, or the power button is pushed in. If the power is on and the button is pushed in, the light stays on even after the system is powered down. When the button is released, the green light turns off.
- **Power Button** turns the system power on and off.
- **LAN LED** indicates communication over the Gigabit or Management LAN.
- **System and Diagnostic LEDs** identify errors on zx6000 workstations with no MP card.
- **Locator LED and Button** (rack-mount configuration only) identify the rack position of the system.
- **Disk Activity LEDs** on each hard drive turn green when the disk is accessed.
- **e-buzzer** icon indicates the position of the internal speaker.



Front Panel, Tower Configuration



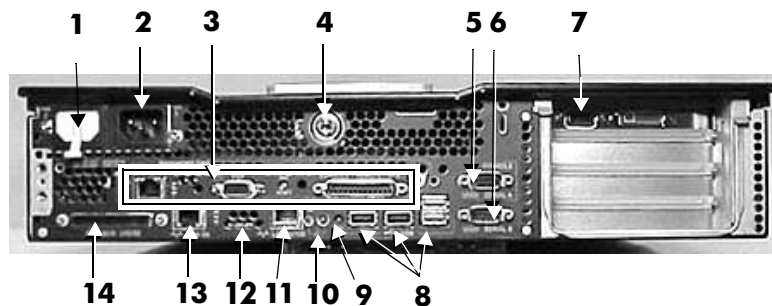
Front Panel, Rack-mounted Configuration

1 e-buzzer icon	5 System LED
2 Locator LED and button (<i>rack-mounted system only</i>)	6 Power button
3 Diagnostic LEDs 1-4 (active only on zx6000 workstations with no MP card installed)	7 Power LED
4 LAN LED	

Rear Panel

The rear panel has the following features:

- **Connectors** are shaped to go in one way only to prevent improper cable attachment.
- **Ports** are labeled for easy identification.
- **Management Processor (MP)** ports are positioned above (rack-mount) or to the right of (tower) standard connectors (optional on zx6000 workstation).
- **LAN LEDs** provide additional information:
 - Four **Gigabit LAN LEDs**
 - Two **System Management 10/100 LAN LEDs**
 - Four **MP LAN LEDs** (optional on zx6000 workstation)
- **Monitor Connector** (on graphics card). zx6000 workstations may include graphics cards with single or multiple monitor support.
- **Locator LED** (rack-mount configuration only) identifies the rack position of the system.



Rear Panel Connectors

1 Power (PWR2)	8 USB ports (mouse and keyboard ports labelled)
2 Power (PWR1)	9 TOC button
3 MP card: VGA, serial, LAN, reset (optional on zx6000 workstation)	10 Locator LED and button
4 System lock	11 10/100 BT Management LAN with integrated LEDs
5 Serial port A (console)	12 10/100/1000 BT Gigabit LAN LEDs
6 Serial port B	13 10/100/1000 BT Gigabit LAN
7 Monitor connector(s) (zx6000 workstation only)	14 LVD/SE SCSI

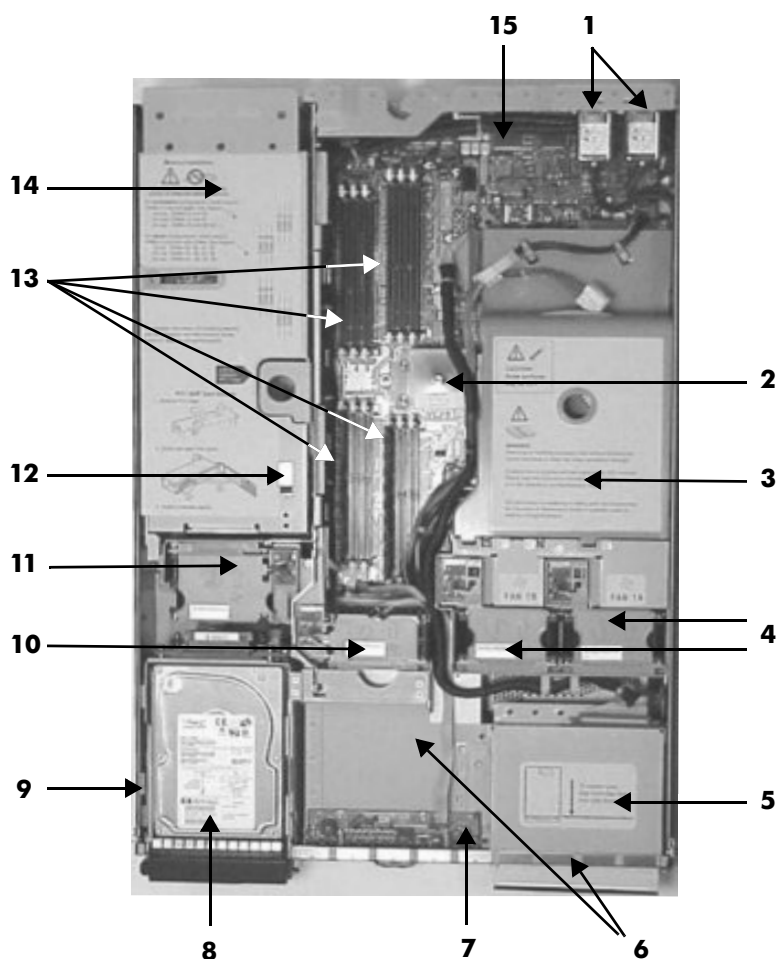
CAUTION: Do not connect a SCSI terminator to the SCSI connector on the back of the system; the connector is automatically terminated. If an external SCSI device is the last device connected externally to the system, you must connect a SCSI terminator to that device.

Installing or Replacing Parts and Accessories

This chapter provides information on:

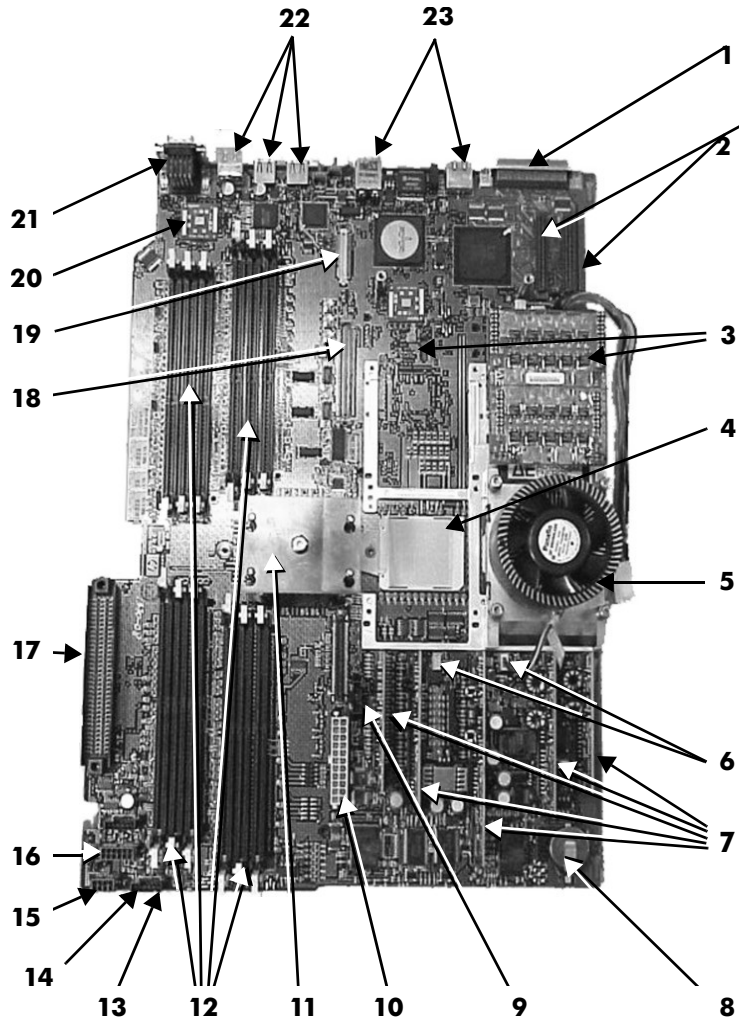
- Location of Internal Components and Connectors
- Remove/Replace Prerequisites
- System Covers and Bezel
- Removing/Replacing Hot-swap and Hot-plug Devices
- Removing/Replacing Internal Components

Location of Internal Components and Connectors



Internal Physical Layout (front of system at bottom of photo)

1 Power receptacles (PWR1 left, PWR2 right)	9 Hard disk lock
2 HP ZX1 memory and I/O controller	10 Memory fan(s)
3 Airflow guide	11 PCI fan
4 System fans (1A right, 1B left)	12 Intrusion switch
5 Slimline optical drive	13 Memory slots
6 Power supplies (PSU1 center, PSU2 under optical drive)	14 PCI/AGP cage
7 Status panel board	15 Management Processor (MP) card (optional)
8 Hot-swappable hard drives (up to 3)	



System Board Connectors and Slots (front of system at bottom of photo)

1 External SCSI connector	13 Status panel connector
2 SCSI connectors A & B	14 Control and standby power connector
3 Processor power Pod(s)	15 SCSI backplane power connector
4 CPU1 (empty socket)	16 PCI/Memory fan cable connector
5 CPU0 (processor under Turbo Fan)	17 PCI/AGP backplane connector
6 Turbo fan power connectors	18 Optical drive connector
7 Five VRM cards	19 Management Processor card connector
8 Battery	20 HP ZX1 I/O adapter
9 System fan connector	21 Serial ports (2)
10 Main power connector	22 USB connectors (4)

11 HP ZX1 Memory and I/O Controller (under heatsink)

23 LAN Connectors (2)

12 Memory Slots

Remove/Replace Prerequisites

Before you remove or replace parts, you must:

- Read the power and EMI warning and note below. (Your safety is important!)
- Gather your tools.
- Follow electrostatic discharge (ESD) precautions.

Read the Power and EMI Warning and Note



WARNING: For most of the installation and removal procedures in this chapter, you must:

1. Power off the system.
 2. Unplug the system power cord from the AC power outlet.
-



CAUTION: To maintain FCC Electromagnetic Interference (EMI) compliance, verify that all covers are replaced and that all screws are properly seated.

Gather Your Tools

You need:

- Flat blade screwdriver
- T-15 Torx driver
- Special processor tool (HP part number A7231-67046)
- Static-free mat
- Static strap

Follow Electrostatic Discharge (ESD) Precautions

To prevent damage to this system, observe all of the following ESD precautions while performing the system parts removal/replacement procedures:

- Work on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge is discharged from your body to ground.
- Create a common ground for the equipment you are working on by connecting the static-free mat, static strap, and peripheral units to that piece of equipment.
- Keep uninstalled printed circuit boards in their protective antistatic bags.
- Handle printed circuit boards by their edges once you have removed them from their protective antistatic bags.

System Covers and Bezel

To upgrade, remove, or replace most system components, you must first remove the covers from the system chassis. This section explains how to remove and replace the covers for both tower and rackmount configurations.



WARNING: Do not remove the system cover(s) without first turning the system off and unplugging the power cord from the outlet or Power Protection Device unless you are *only* replacing a hot-swappable fan. Always replace the cover(s) before turning the system on.

Tower System

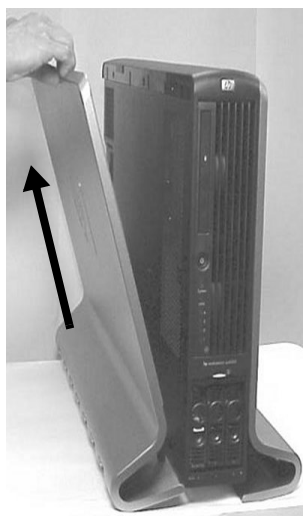
To access the internal components on a tower system, you must remove the plastic and metal left-side covers.

Removing the Side Covers

1. Turn off the system and disconnect the power cable and all other cables from the back of the system.

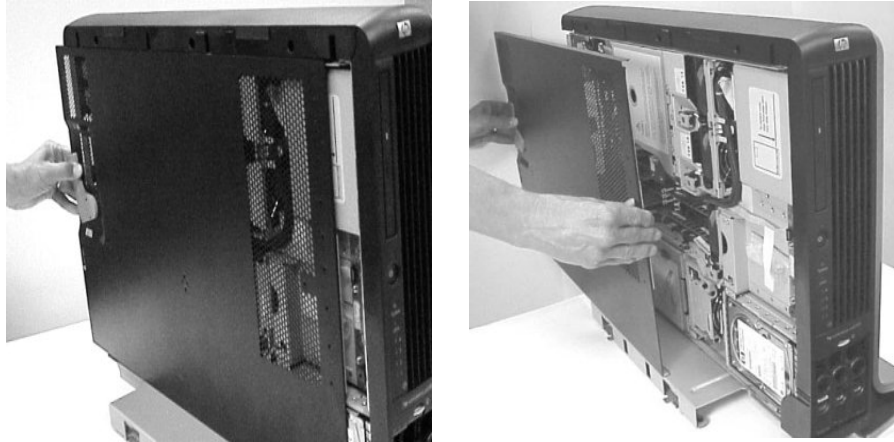
NOTE: If you are removing *only* a hot-swappable system fan or a hot-plug hard drive, you can leave the system on and the power cables connected.

2. Remove the plastic cover.
 - a. Grasp both indentations at the top of the side panel and pull outward.
 - b. Lift the plastic cover off of the system chassis.




Removing the Left-side Panel

3. Remove the metal cover:
 - a. Turn the top cover lock keyswitch is in the unlocked position.
 - b. Rotate the blue release handle to release the latch.
 - c. Slide the cover toward the back of the chassis, then lift it off.



Removing the Metal Side Cover

 **CAUTION:** The zx6000 and rx2600 systems depend on the access panels for proper cooling of internal components. Operating the system with the side cover removed can cause the system to quickly overheat.

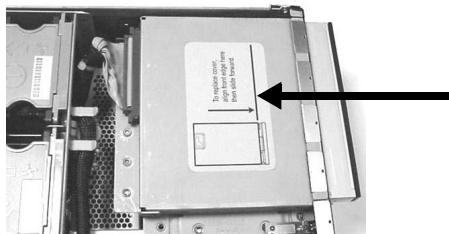
Replacing the Covers

1. Replace the metal cover:



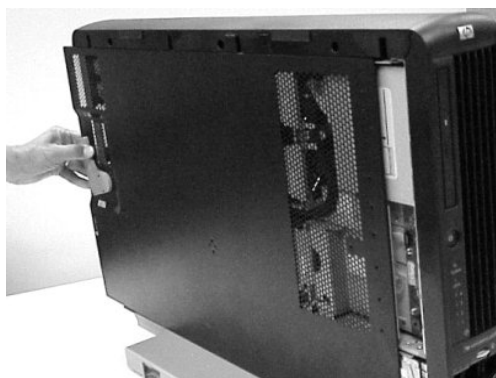
CAUTION: Secure any wires or cables in your system so they do not get cut or interfere with the replacement of the cover.

- a. Align the front edge of the metal cover with the alignment mark on the optical drive bay.



Metal Cover Alignment Mark

- b. Place the metal cover on the chassis and slide it toward the front of the system until the blue release lever snaps in place.



Replacing the Metal Cover

2. Replace the plastic cover:
 - a. Align the cover's mounting holes with the matching tabs on the system chassis.
 - b. Close the cover until it snaps onto the system chassis.



Replacing the Plastic Cover

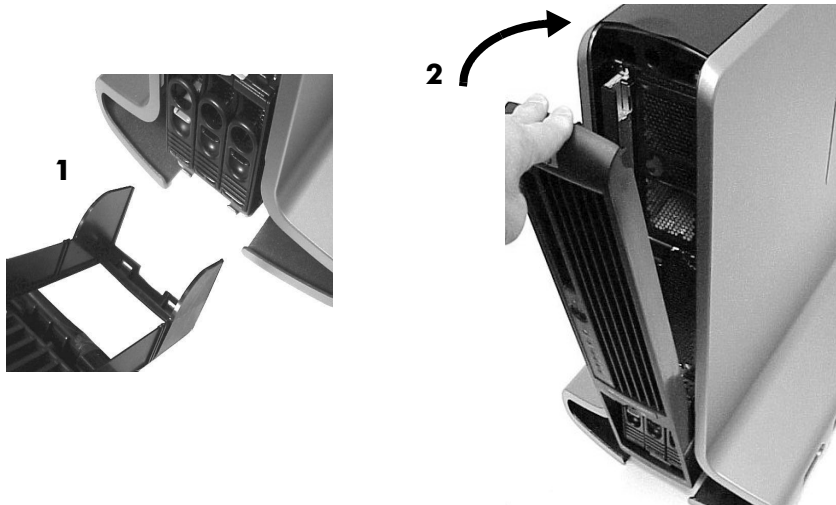
Removing the Front Bezel

You must remove the front bezel from the chassis to upgrade, remove, or replace the power supplies or the optical drive.

1. Firmly grasp the finger grip at the top of the bezel and pull forward until the bezel snaps open.
2. Lift the bezel off of the chassis.

Replacing the Front Bezel

1. Insert the bezel's latches into the matching slots on the system chassis.
2. Close the bezel and push toward the front of the system until it snaps into place.



Aligning the Front Bezel

Rack-mount System

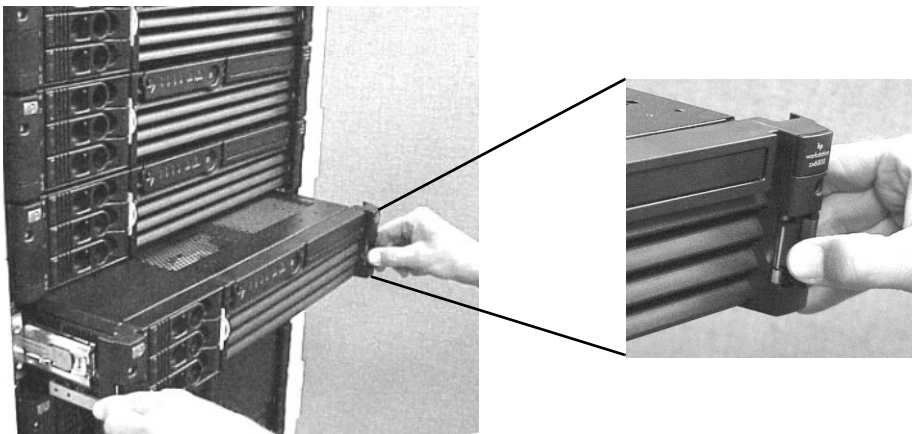
To access the internal components on a rack-mounted system, pull the system out on the rail guides and remove the metal cover.

Removing the Metal Cover

1. Turn off the system and disconnect the power cable and all other cables from the back of the system.

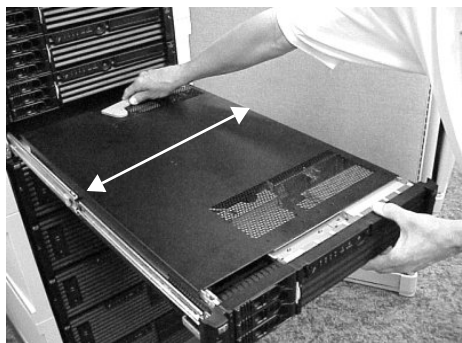
NOTE: If you are removing *only* a hot-swappable system fan or a hot-plug hard drive, you can leave the system on and the power cables connected.

2. Release the rack latches by rotating them outward.



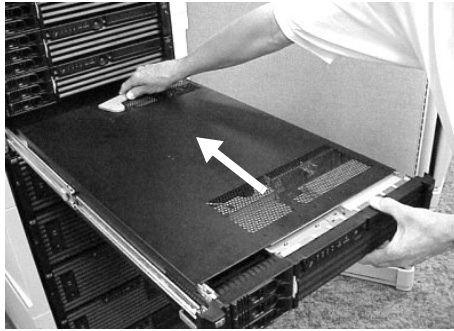
Releasing the Rack Latches

3. Slide the system out of the rack until the guide-rail release clips are visible.

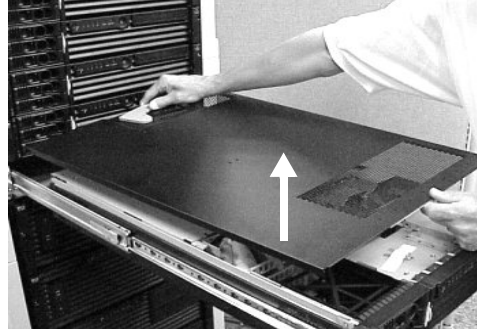


Guide-rail Release Clips

4. Ensure the top cover lock keyswitch is in the unlocked position, then rotate the blue release lever toward the back of the system and slide the panel toward the back of the system.
5. Lift the panel off the system chassis.



Removing the Metal Cover

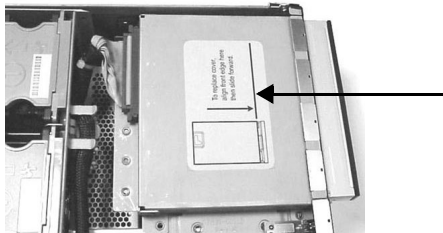


Replacing the Cover



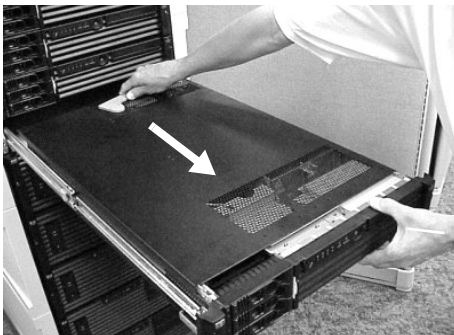
CAUTION: Secure any wires or cables in your system so they do not get cut or interfere with the replacement of the cover.

1. Align the front edge of the cover with the alignment mark on the optical drive bay.



Metal Cover Alignment Mark

2. Grasp the blue release lever and slide the cover toward the front of the system until the lever snaps into place.



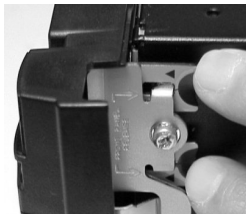
Replacing the Metal Cover

3. Slide the system into the rack enclosure and reconnect the power cables.

Removing the Front Bezel

You must remove the front bezel from the chassis to upgrade, remove, or replace the power supplies or the optical drive.

1. Press in on the retaining clips located on the right-side of the front panel.

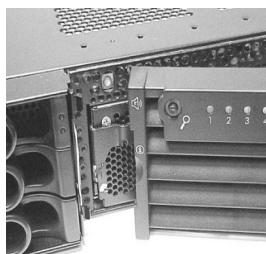


Retaining Clip

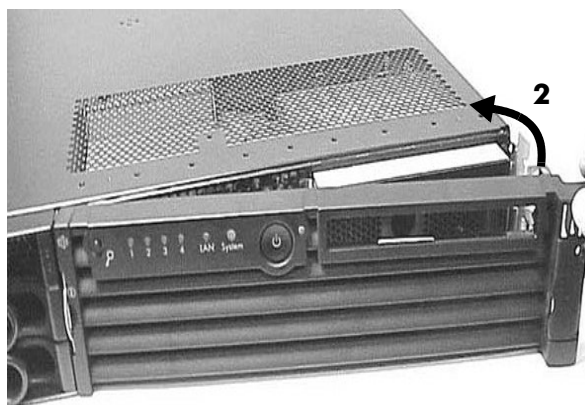
2. Rotate the front panel outward and lift it off the system chassis.

Replacing the Front Bezel

1. Insert the bezel latches into the matching slots on the system chassis.
2. Close the bezel and push toward the front of the system until it snaps into place.



Align the Front Bezel




Removing/Replacing Hot-swap and Hot-plug Devices

The rx2600 and zx6000 have hard disk drives that are hot-pluggable and power supplies and fans that are hot-swappable. This section explains how to swap the following devices while the system is running:

- System fans
- Power supplies
- Hard drives

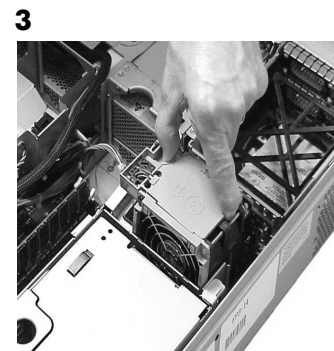
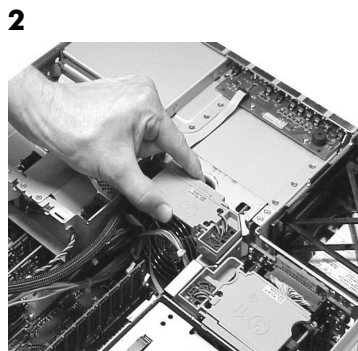
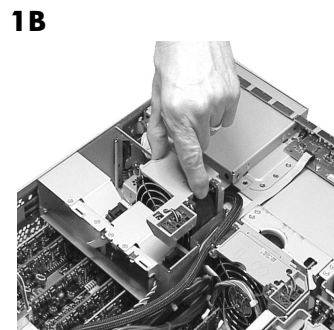
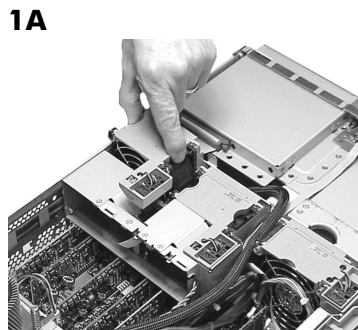
System Fans

There are four system fans to keep the system cool when it is running. The system fans are hot-swappable, allowing you to replace a fan while the system is running.

 **CAUTION:** When the system is running, the metal cover must be replaced within four minutes to prevent components from overheating.

Removing a System Fan

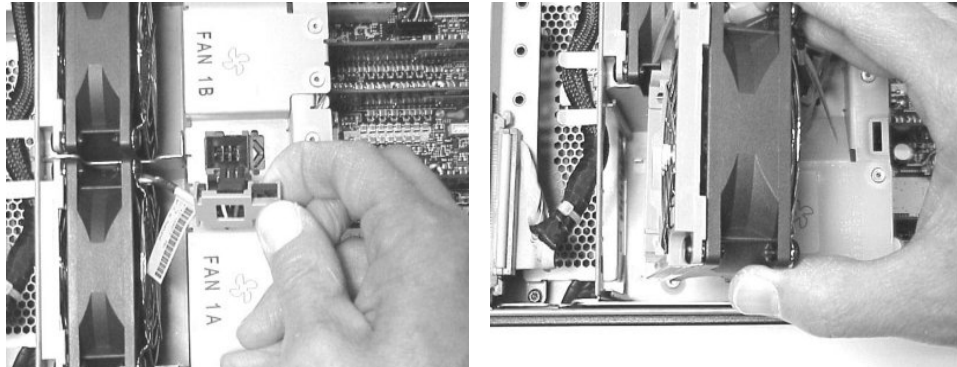
1. Remove the system cover(s).
2. Remove the fan.
 - a. To remove:
 - ◆ fan 1A, 1B, 2, or 3 from a rack-mounted system, or
 - ◆ fan 3 from a tower system, grasp the appropriate fan and lift it out of the fan socket.



Removing System Fans

b. To remove *fan 1A, 1B, or 2* from a *zx6000* tower system:

- ◆ Unplug the fan power connector, then
- ◆ Remove the fan from the system.



Removing Fans 1A, 1B, or 2 from a Tower System

Replacing a System Fan

1. Grasp the replacement fan module and insert it into its fan socket.




CAUTION: Replace the metal cover within four minutes to prevent damage to the system components.

2. Verify that the fan has been properly installed by observing the LED signals on the front of the system for the appropriate fan information (see Chapter 3).

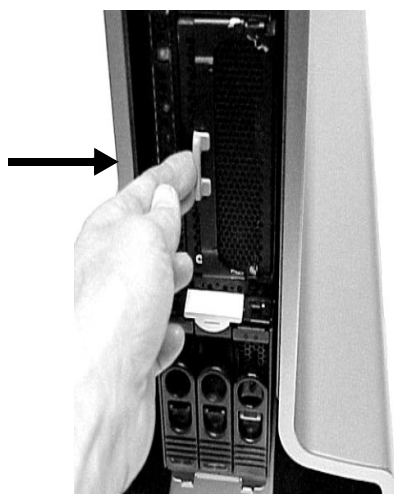
Power Supplies

The power supplies in the zx2600 and zx6000 systems are hot-swappable; that is, if one power supply stops working or exhibits voltage problems, the remaining supply can support the system until the failed unit is replaced. On systems with two power supplies, one power supply can be removed and replaced without turning off the system.

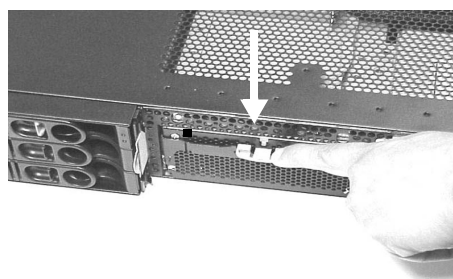
 **CAUTION:** Before removing a power supply, make sure the second power supply is functioning properly. The two green LEDs inside the supply must **both** be lit on the second supply before the failed power supply can be safely removed.

Removing a Power Supply

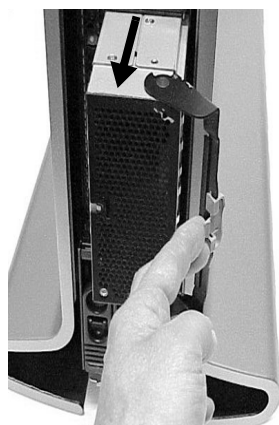
1. Remove the front bezel from the system.
2. Press the power supply retaining clip to unlatch the power supply release lever.



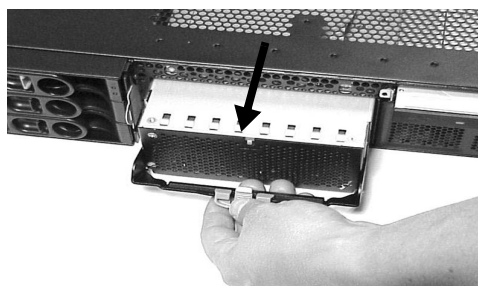
Releasing the Power Supply Retaining Clip



3. Depress the power supply release lever and slide the power supply out of the system.

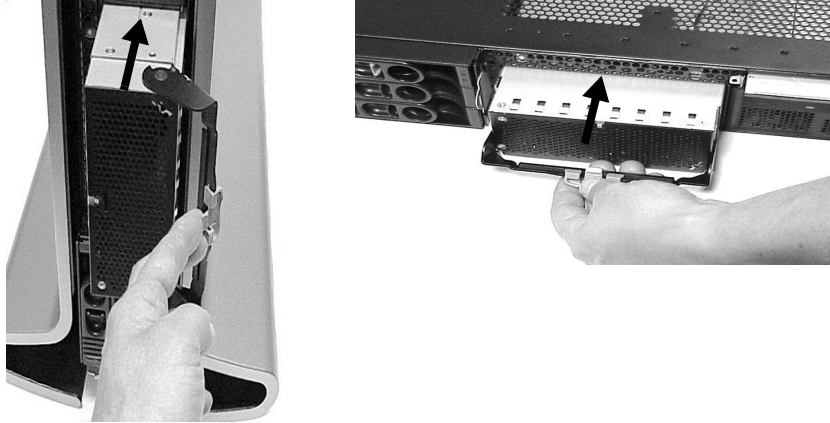


Removing the Power Supply from the System



Replacing a Power Supply

1. Remove the front bezel from the system and remove the defective power supply if you have not already done so.
2. Open the power supply release lever and slide the power supply into place.



Sliding the Power Supply into Place


3. Push in on the power supply release lever to lock the retaining clip in place.
4. Replace the front bezel.

Hard Drives

The zx6000 and rx2600 systems can support up to three **hot-pluggable**, Low-Voltage Differential (LVD) hard disk drives. These hard disk drives are 3.5-inch form factor, 10K and 15K RPM devices that connect to Ultra 320 Wide LVD (Low Voltage Differential) SCSI interfaces on the disk bay backplane.

There is a significant difference between the terms *hot-pluggable* and *hot-swappable*:


- Hot swapping happens at the device level; that is, a hot-swappable device manages insertion/removal on its own without assistance from operating system commands.
- The hot-plug process allows you to replace a defective disk drive in a high-availability system while it is running.

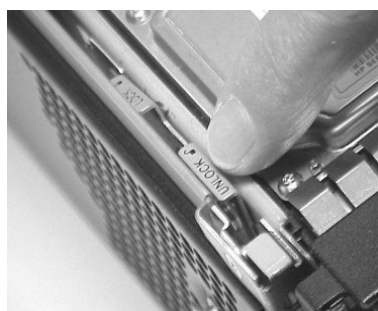
 **CAUTION:** The disk drives in the zx6000 and rx2600 are not hot-swappable; they are merely hot-pluggable. A manual software procedure must be done in order to safely remove or insert disk drives while the system is running. To avoid damage to the hard drives:

- See the documentation provided with the drive for additional details on inserting/removing a disk drive.
 - See your OS documentation for instructions on preparing the OS for inserting/removing a hard drive.
-

Removing a Hard Drive

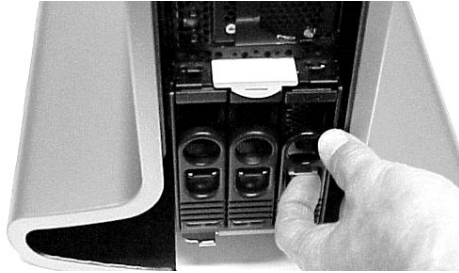
1. If the system is powered on and the OS is running, prepare the OS to have the disk drive removed. See your OS documentation for instructions on preparing the OS for removing and inserting hard drives.
2. If you have locked your hard drives, you must unlock them before removing or replacing a drive:
 - a. Remove the cover(s).
 - b. Press down on the **Unlock** lever to unlock the drive.

 **CAUTION:** If you try to remove a hard disk drive *without* unlocking it from the system, you will damage the hard drive bay.

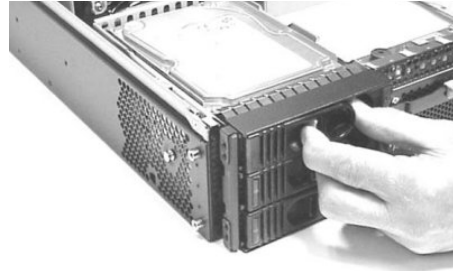


Unlocking the Hard Drives

3. Squeeze inward on the colored release clip on the hard drive release lever.



Releasing the Hard Drive Release Clip



4. Pull outward on the release lever to remove the drive from the system.



Removing the Hard Disk Drive



Replacing a Hard Drive

1. If the system is powered on and the OS is running, prepare the OS to have the disk drive removed. See your OS documentation for instructions on preparing the OS for removing and inserting hard drives.
2. Insert the hard disk drive into the drive bay from which you removed the drive and push inward on the release lever until the drive no longer slides forward. You must leave the release lever in the open position, as shown, when you push the drive into the system.
3. Push in on the release lever to secure the drive in the bay and to ensure that the drive connector is seated properly.
4. Reset the system to the EFI Boot Maintenance Menu to rescan the hard drives.
5. If desired, lock the hard drive in place. Replace the system covers if they were removed to unlock drives.
6. Use the EFI shell **map** command to verify that the new drive has successfully been installed.

Removing/Replacing Internal Components

To upgrade, remove, or replace most system components, you must first remove the covers from the system chassis.



WARNING: Do not remove the system cover(s) without first turning the system off and unplugging the power cord unless you are *only* replacing a hot-swappable system fan. Always replace the cover(s) before turning the system on.

Airflow Guides

The system has the following airflow guides:

- The **processor airflow guide** provides the proper volume of air-flow for cooling the processor(s) and voltage regulator modules (VRMs).

You must remove the processor airflow guide:

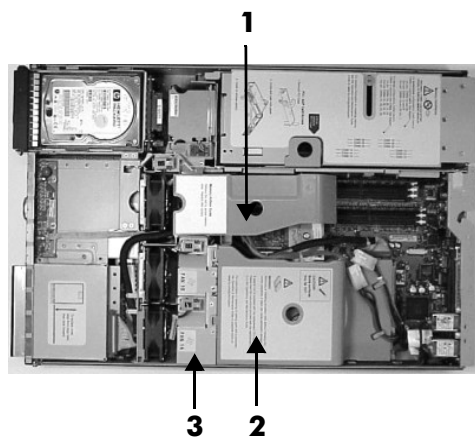
- if it is damaged to the point that airflow across the processor(s) is restricted
- to access to components under the airflow guide

- The **memory airflow guide** ensures that the proper volume of air flows over the memory cards to cool them.

You must remove the memory airflow guide:

- if it is damaged to the point that airflow across the memory cards is restricted
- to access memory modules and slots

NOTE: Air flows through the system from front to back.

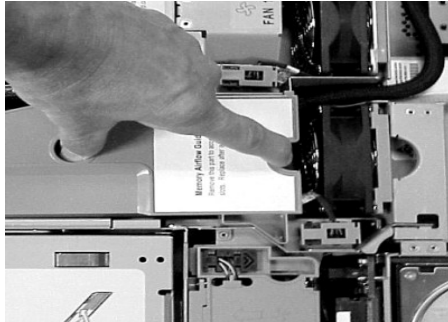


System Airflow Guides

-
- | | |
|----------|------------------------------------|
| 1 | Memory Airflow Guide |
| 2 | Processor Airflow Guide |
| 3 | Processor Airflow Guide Front Half |
-

Removing the Memory Airflow Guide

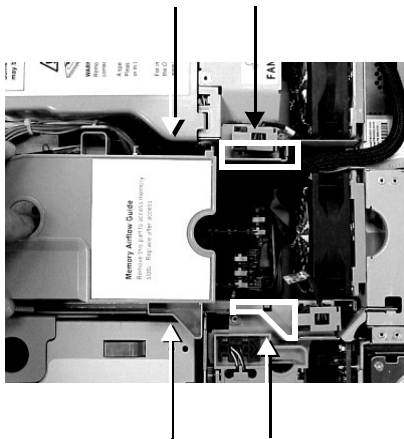
1. Turn off the system, disconnect all power cables, and remove the cover(s).
2. Grasp the memory airflow guide and lift it out of the system.



Removing the Memory Airflow Guide

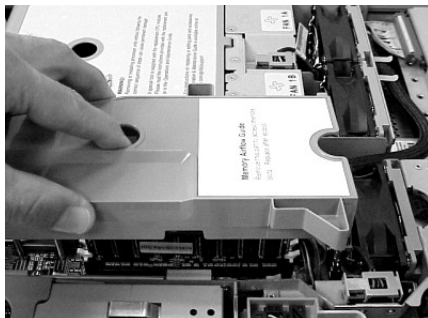
Replacing the Memory Airflow Guide

1. Align the guides on both sides of the airflow guide with the slots on the chassis.



Aligning the Memory Airflow Guide

2. Insert the memory airflow guide in the slots.



Replacing the Memory Airflow Guide

3. Replace the cover(s) and reconnect all of the power cables.

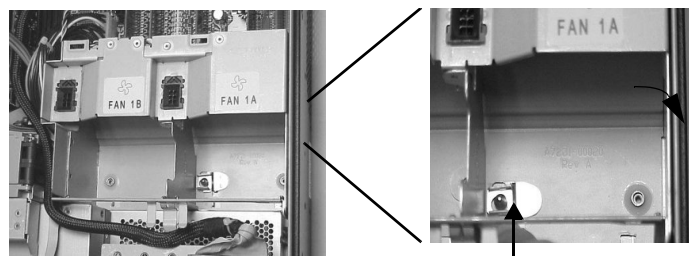
Removing Processor Airflow Guide

1. Turn off the system, disconnect all power and external cables, and remove the system cover(s).
2. Remove the IDE and power cables from the processor airflow guide cable clips.
3. Remove the main portion of the airflow guide:
 - a. Hold the guide using the opening on top of the guide.
 - b. At the same time, grasp the back end of the airflow guide and lift the guide out of the system.



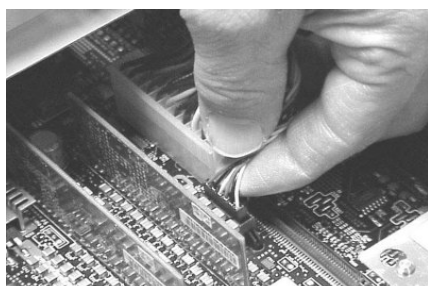
Removing the Main Portion of the Processor Airflow Guide

4. Remove the front portion of the airflow guide:
 - a. Remove system fans 1A and 1B (page 2-14).
 - b. Rotate the clip clockwise to release the latch.



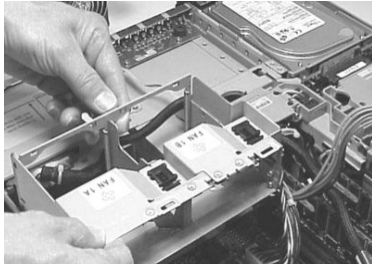
Airflow Guide Release Latch and Post

5. Disconnect the power cable connected to the guide from the system board.



Power Connector for Front Portion of Airflow Guide

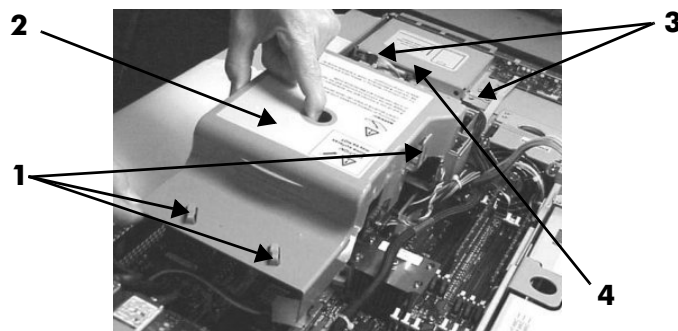
6. Lift the front portion of the airflow guide out of the system.



Removing the Front Portion of the Airflow Guide

Replacing the Processor Airflow Guide

1. Replace the front portion of the airflow guide:
 - a. Align the release latch of the front half of the airflow guide over the release latch post and snap it in place.
 - b. Connect power connector on the front portion of the guide to the connector on the system board.
 - c. Replace system fans 1A and 1B (page 2-15).
2. Replace the main portion of the airflow guide:
 - a. Hold the opening on top of the processor airflow guide.
 - b. At the same time, grasp the back end of the airflow guide and insert the airflow guide into the system.
 - c. Connect the power cable and place the power and IDE cables in the cable clips.
 - d. Insert the two airflow guide retaining tabs into the two slots on the front half of the airflow guide.



Replacing the Processor Airflow Guide

1	Cable clips
2	Main portion of airflow guide
3	Retainer clips
4	Front portion of airflow guide

3. Replace the system cover(s). Reconnect cables.


Memory

Your system has 12 memory slots for installing DDR SDRAM memory modules. Modules can be 256 MB, 512 MB, 1 GB or 2 GB. The system supports combinations from 512 MB (zx6000) or 1 GB (rx2600) up to 24 GB. For HP approved memory modules, see Appendix C.

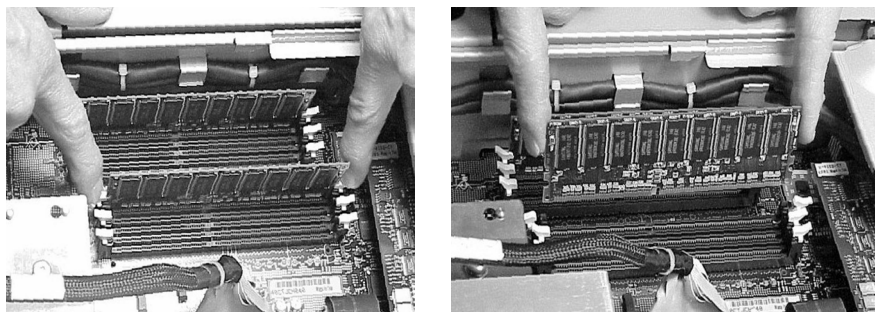
NOTE: zx6000 workstations running Windows XP 64-Bit Edition Version 2003 only support up to 16 GB of RAM.

Removing Memory Modules

1. Turn off the system, disconnect power, LAN and telecommunications cables, and remove the cover(s).

 **CAUTION:** To ensure that memory modules are not damaged during removal or installation, turn off the system and unplug the power cord from the AC power outlet. Wait until the LED on the back of the power supply turns off before removing memory.

2. Press down on the memory module retainer clips and lift the module out of its memory slot.



Memory Module Retainer Clips

3. If the removed memory is functional, store it in a static-free container for future use.

Replacing Memory Modules

Memory modules must be loaded in the correct order:

- In the zx6000 workstation, DIMMs must be installed as ordered pairs of equal size. For example, the DIMM in slot 0A must match 0B, 1A must match 1B, and so forth.
- In the Integrity rx2600 server, DIMMs must be installed in matched quads. Four identical DIMMs must be installed, one pair per memory cell, as listed below:
 - ❑ 0A, 0B and 1A, 1B must match
 - ❑ 2A, 2B and 3A, 3B must match
 - ❑ 4A, 4B and 5A, 5B must match

This loading order must be used to enable chip spare functionality, available only on rx2600 systems. For more information, see Appendix B.

NOTE: DIMMs match if they have the same HP part number.


- Module sizes can be mixed, as long as DIMMs in each pair (zx6000) or quad (rx2600) match. For example:
 - ❑ On zx6000 workstations, it is acceptable to load a pair of 256 MB DIMMs in slots 0A and 0B, and a pair of 1 GB DIMMs in slots 1A and 1B.
 - ❑ On Integrity rx2600 servers, it is acceptable to load a quad of 256 MB DIMMs in slots 0A, 0B, 1A and 1B, and a quad of 1 GB DIMMs in slots 2A, 2B, 3A and 3B.

	Loading Order	Memory Cell 0	Memory Cell 1	Loading Order	
<i>Front</i>	1st	DIMM 0B	DIMM 1B	2nd	<i>Back</i>
	5th	DIMM 4B	DIMM 5B	6th	
	3rd	DIMM 2B	DIMM 3B	4th	
	1st	DIMM 0A	DIMM 1A	2nd	
	5th	DIMM 4A	DIMM 5A	6th	
	3rd	DIMM 2A	DIMM 3A	4th	

Memory Loading Order

To install or replace a memory module:

1. Turn off the system, disconnect all cables, and remove the system cover(s).

 **CAUTION:** To ensure that memory modules are not damaged during removal or installation, power off the system and unplug the power cord from the AC power outlet. Wait until the STBY PWR LED on the System Board turns off before removing or installing memory.

2. Holding the memory module by its left and right edges, insert the module into the slot.

The memory modules are keyed and can only be inserted in one direction. When the module is correctly seated, the retainer clips return to their fully upright position. Snap the clips firmly into place to ensure that the DIMMs are seated properly.

3. Replace the system cover(s), reconnect all cables and turn on the system.
4. Verify correct memory configuration. Either:
 - Run the **info mem** command at the EFI shell prompt (page 3-7).
 - On systems with firmware version 2.0 or higher, check the configuration using the EFI **System Configuration menu** (page 3-22).

Accessory and Graphics Cards

The zx6000 has the following accessory card slots:

- Three 64-bit, 133 MHz PCI-X card slots
- One AGP Pro 4×, 1.5V slot

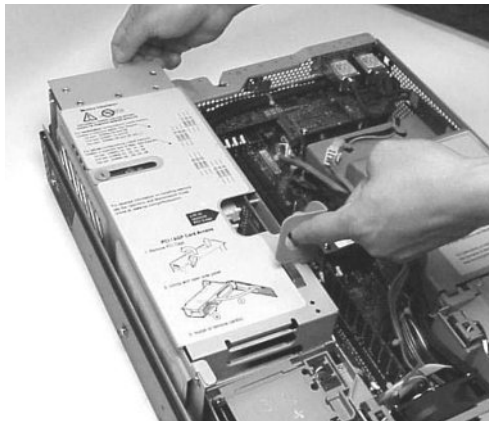
The rx2600 has the following accessory card slots:

- Four 64-bit, 133 MHz PCI-X card slots

Accessory cards are installed in a removable PCI/AGP cage. This section explains how to access the PCI/AGP cage, as well as how to remove and install accessory cards.

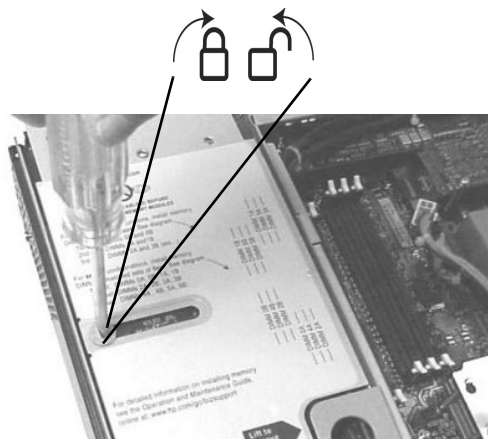
Removing an Accessory or Graphics Card

1. Turn off system, disconnect all power and external cables, and remove the system cover(s).
2. Lift up on the PCI/AGP cage release lever and the back edge of the PCI/AGP cage and lift the PCI/AGP cage out of the system.



Removing the PCI/AGP Cage

NOTE: If you are removing an AGP card, you may also need to remove the AGP shipment retainer. Turn the shipment retainer counterclockwise and lift it out of the system.



Plastic AGP Card Shipment Retainer

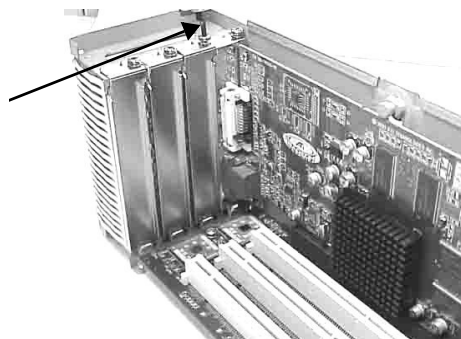
3. Grasp the PCI/AGP cage cover and slide it away from the bulkhead end of the cage, then lift the cover off.



Removing the PCI/AGP Cage Cover

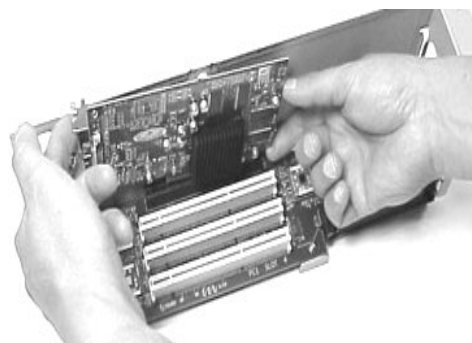
4. Unscrew the bulkhead screw that holds the accessory card in place.

NOTE: If you are removing an audio card, unplug the audio cable from the card.



Removing the Bulkhead Screw

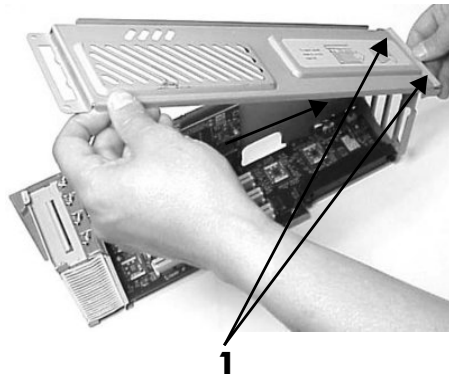
5. Grasp the bulkhead end of the card and the opposite edge and lift the card out of the slot. If you are not installing a new card in the same slot, install a blank in the slot.



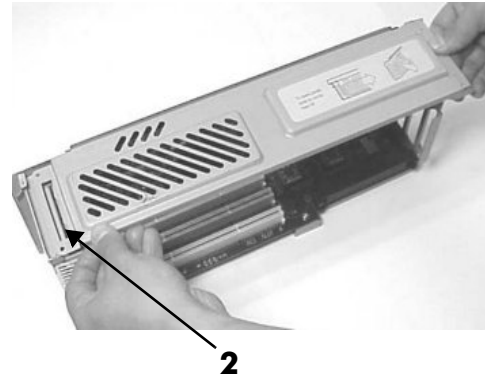
Removing the Accessory Card

Replacing an Accessory or Graphics Card

1. Remove the PCI/AGP cage (page 2-27).
2. Remove any bulkhead blank (if present) from the slot to be used.
3. Insert the card:
 - a. Grasp the bulkhead end of the card and its opposite edge and insert the card into the slot. If you are replacing a card, put the new card into the same slot from which you removed the old card.
 - b. Secure the card by attaching the screw that was used to hold the blank in place.
4. Attach the cover to the cage:
 - a. Slide the retaining tabs on the fan end of the cover into the retaining slots and press the cover down on the accessory board(s).
 - b. Slide the tab at the bulkhead end of cage (1) into the slot on the cover (2).



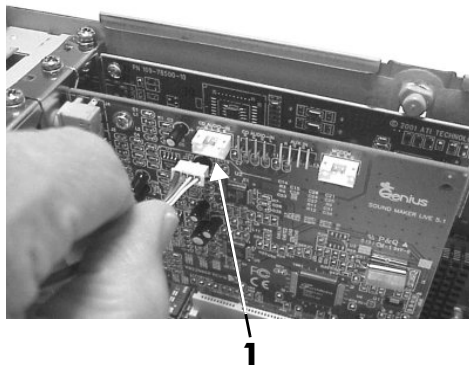
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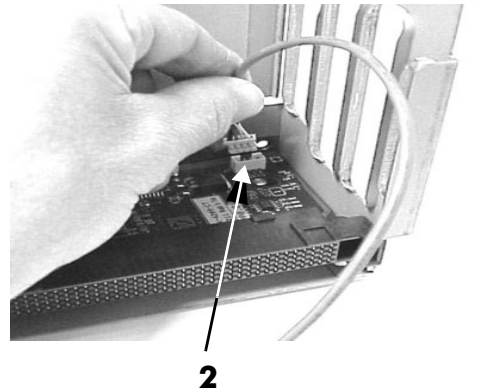
2

Replacing the PCI/AGP Cage Board Cover

5. If you are replacing an audio card, attach the audio cable to the card (1) and to the connector on the PCI/AGP backplane (2).



1



2

Connecting the Audio Cable

6. Place the PCI/AGP cage back in the system and secure it:
 - a. Align the PCI/AGP cage in the system, then depress the release lever to lock the cage in place.
 - b. If you have an AGP card installed, secure the plastic shipment retainer.
7. Replace the cover(s), reconnect all of the power and external cables and turn on the system.
8. Verify that new cards have been correctly installed:
 - Run the **info io** command at the EFI shell prompt (page 3-7) or,
 - On systems with firmware version 2.0 or higher, check the configuration using the EFI **System Configuration menu** (page 3-22).


NOTE: Ensure that the audio cable is properly installed by connecting headphones to the audio OUT jack on the audio card and playing audio media in the optical device.

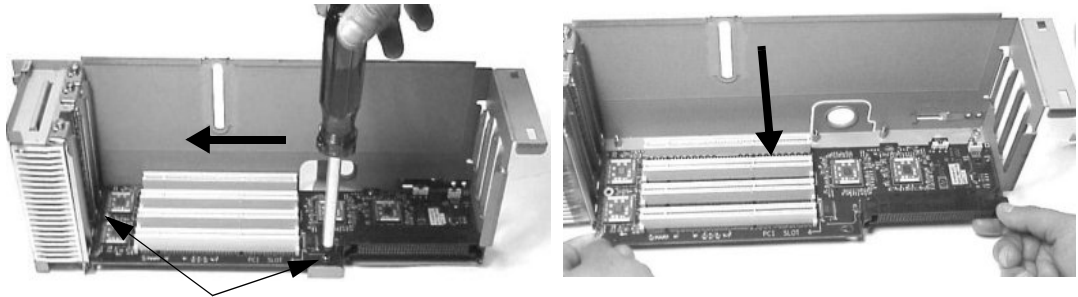
PCI/AGP Backplane

Removing the PCI/AGP Backplane

The backplane for the zx6000 includes one AGP card slot and three PCI card slots. The rx2600 system backplane is called the PCI/AGP backplane. The removal process is the same for both.

1. Remove all accessory and graphics cards.
2. Unscrew the backplane mounting screws and slide the backplane board toward the bulkhead end of the PCI/AGP cage. This unlocks the backplane from its standoffs.
3. Lift the backplane over the top of the standoffs and slide it out of the cage.

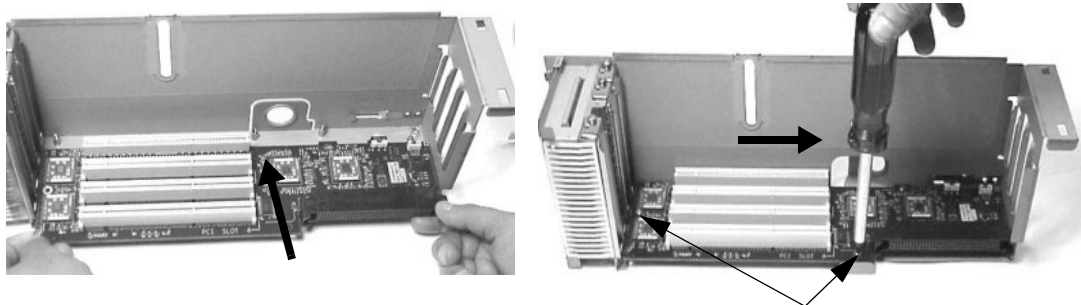
 **CAUTION:** Be careful not to damage the intrusion switch.



Removing the PCI/AGP backplane (rx2600 shown)

Replacing the PCI/AGP Backplane

1. Place the backplane in the cage by aligning the cage standoffs with the holes on the backplane and slide it into place.
2. Secure the PCI/AGP backplane by screwing in its mounting screws.



Replacing the PCI/AGP backplane (rx2600 shown)

3. Replace any accessory and graphics cards.

Optical Drives

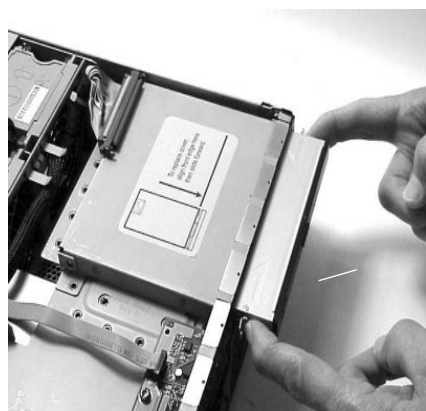
Removing an Optical Drive

1. Turn off the system, disconnect all power and external cables, and remove the system cover(s).
2. Disconnect the IDE cable from the back of the optical drive. Pull back on the retaining clips on the connector cable to release the cable.



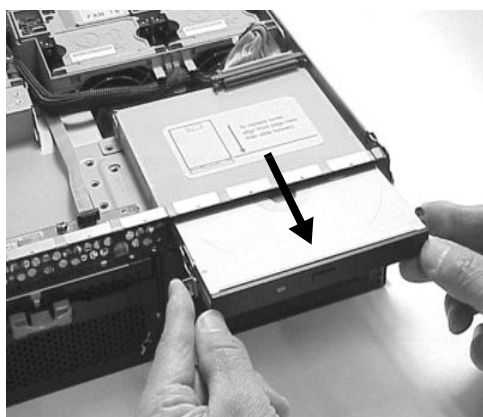
Disconnecting the Optical Drive IDE Cable

3. Press the small retaining clips on both sides of the optical drive inward to release them.



Releasing the Optical Drive Retaining Clips

4. Slide the optical drive out of the optical drive bay.

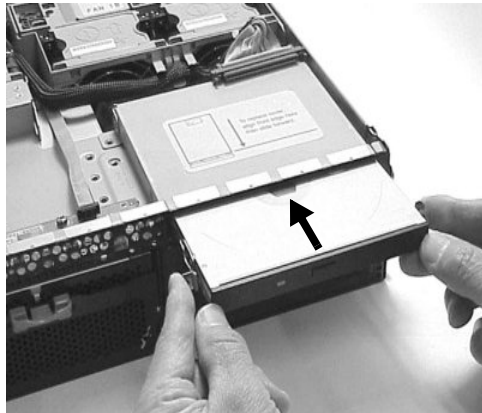


Removing the Optical Drive

Replacing an Optical Drive

1. Slide the optical drive into the drive bay until it stops sliding and the retaining clips on both sides of the optical drive snap into place.

Grasp both sides of the drive without pressing in on the retaining clips and pull outward. If you can pull outward on the optical drive without it sliding out of its bay, the optical drive is securely in place.



Replacing the Optical Drive

2. Connect the IDE cable on the back of the optical drive.
3. Replace the system cover(s), reconnect all of the power and external cables and turn on the system.
4. Verify that the optical drive has been properly installed:
 - Run the **info io** command at the EFI shell prompt (page 3-7) or,
 - On systems with firmware version 2.0 or higher, check the configuration using the EFI **System Configuration menu** (page 3-22).

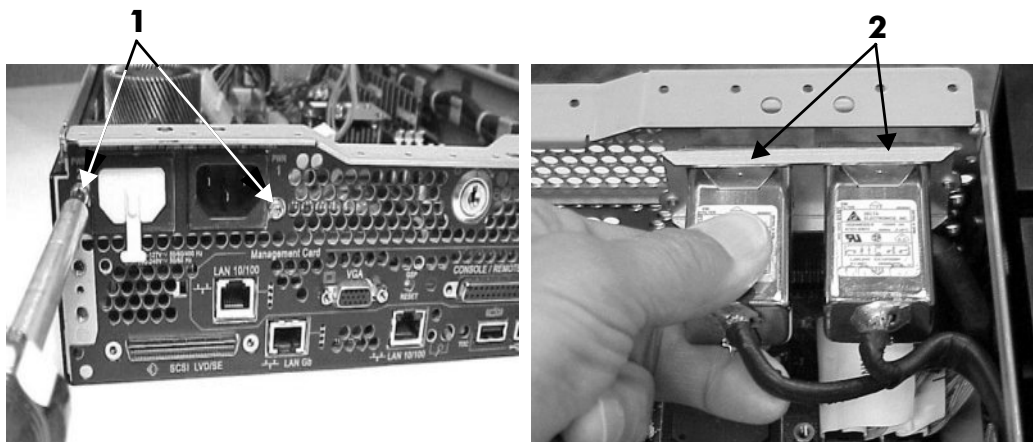
Management Processor Card

The optional Management Processor (MP) card includes these ports:

- 10/100 BT Management LAN port
- 15-pin VGA port
- 25-pin serial port

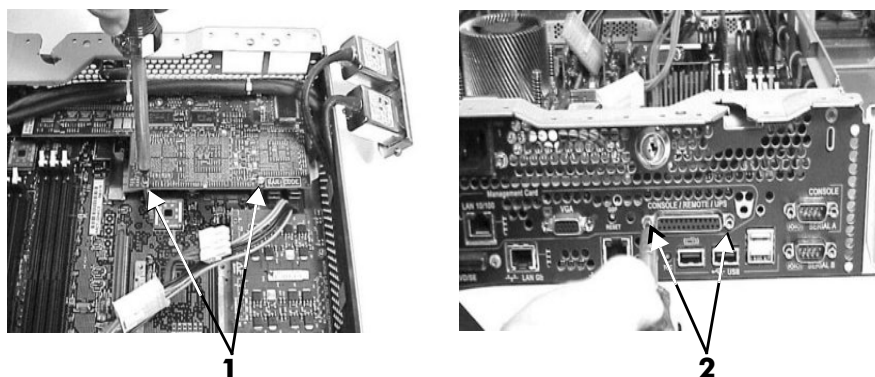
Removing the MP Card

1. Record the network settings from your MP card before beginning this task. See “Management Processor (MP)” on page 3-27.
2. Turn off the system, disconnect all power and external cables and remove the cover(s).
3. Unscrew the two power connector mounting screws (1) and remove the power connector plate (2) from the back of the system.



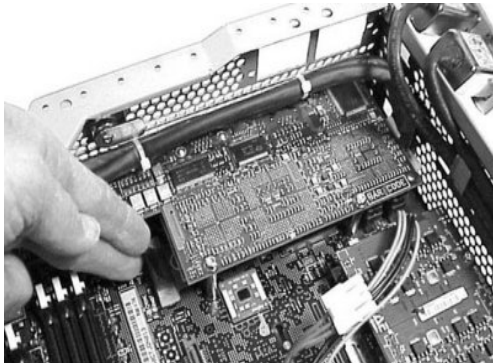
Removing the Power Connectors

4. Unscrew the two mounting screws that connect the MP card to the internal chassis post (1) and the two external mounting screws that are located on both sides of the 25-pin serial connector (2).



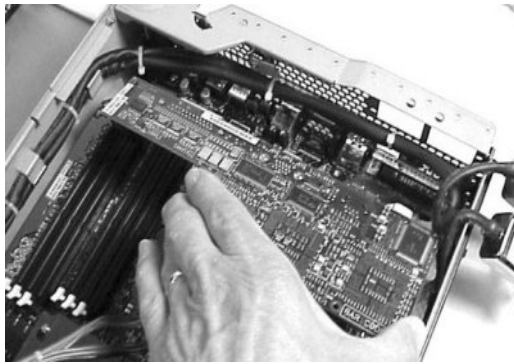
Unscrew the MP Card Mounting Screws

5. Disconnect the MP card connector.



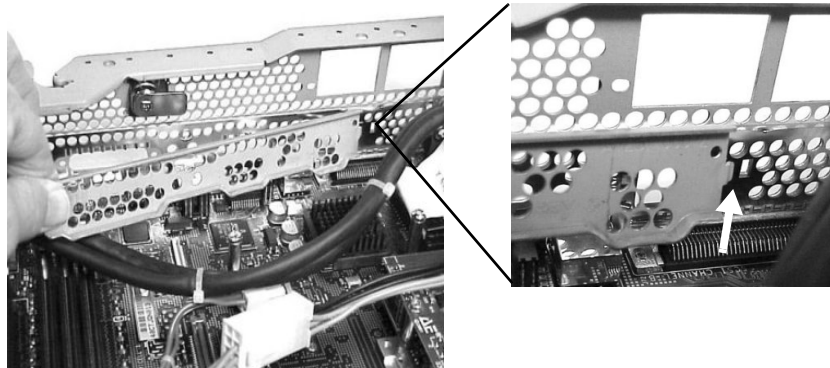
Disconnecting the MP Card Connector

6. Remove the MP card from the system by grasping it by its edges.



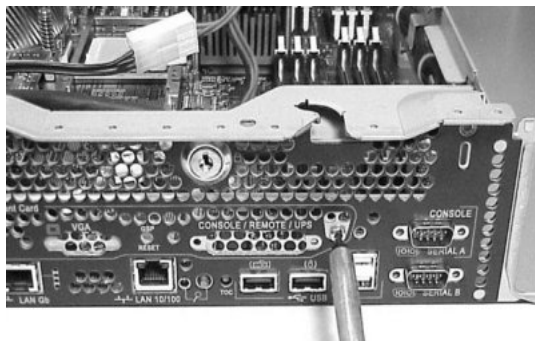
Removing the Card

7. Replace the MP card blank, if available, on the chassis. This blank is used to fill the holes left by the LAN, 15-pin VGA and 25-pin serial connectors.
 - a. Insert the blank retaining tab into the slot on the chassis.



Aligning the MP Card Blank

- b. Push the MP card blank against the inside of the chassis and screw in the blank's mounting screw on the external connector side of the system's chassis.



Securing the MP Card Blank

8. Replace the cover (s) and reconnect the power and external cables.

Replacing/Installing the MP Card

1. Turn off the system, disconnect all power and external cables and remove the system cover(s).
2. If you are installing a new card, remove the MP card blank:
 - a. Unscrew the mounting screw for the MP card blank, located on the external connector side of the system chassis.
 - b. Remove the blank retaining tab out of its slot on the system chassis and remove the blank from the system.
3. Insert the MP card in the system:
 - a. Grasp its edges and place it on the two MP card posts.
 - b. Push the LAN, 15-pin VGA and 25-pin serial connectors through their openings on the back of the system.
4. Connect the MP card:
 - a. Connect the MP card cable to its connector on the system board.
 - b. Screw in the two mounting screws that connect the MP card to the internal chassis post.
 - c. Screw in the two external mounting screws that are located on both sides of the 25-pin serial connector.
 - d. Replace the two power connectors.
5. Replace the system cover(s) and reconnect the power and external cables.

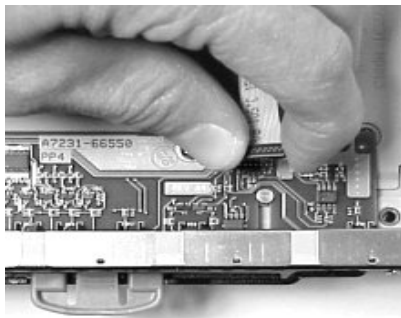
Led Status Panel

The LED status panel card contains the system LEDs and the e-buzzer.

CAUTION: Some system settings are saved to the LED status panel. If you are replacing **both** the LED status panel and the system board, they must be replaced one at a time to avoid loss of system settings. First replace one component, then turn on the system and boot to the EFI prompt. After confirming that the first component has been replaced successfully, shut down the system and replace the second component.

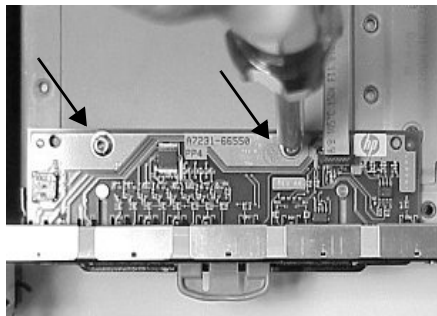
Removing the LED Status Panel

1. Turn off the system, disconnect all power cables, and remove the system cover(s).
2. Disconnect the LED status panel's controller cable.

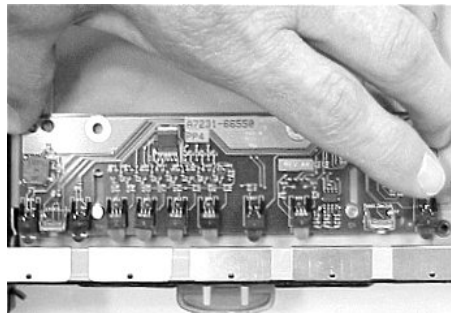


Disconnect the LED Status Card Controller Cable

3. Unscrew the two LED status panel mounting screws and remove the panel.



Remove the LED Status Card



Replacing the LED Status Panel

1. Replace the LED status panel in the system and screw in the two LED status panel mounting screws.
2. Connect the LED status panel controller cable.
3. Replace the system cover(s) and reconnect all power cables. Turn on the system and verify that the system and power LEDs light up.
4. Copy a valid UUID to the new status panel. To do this, during boot up press **Y** at this prompt:

```
EFI version 1.10 [14.57]
Build flags: EFI64 Running on Intel(R) Itanium Processor
EFI 1.10 IA-64 FOUNDATION XPEAK 1.22 [Tue May 14 16:37:12 2002] - HP
Secondary UUID is undefined
Do you want to copy the valid UUID to the new board?
(y/[n])
```

A message similar to this appears:

```
EFI version 1.10 [14.57]
Build flags: EFI64 Running on Intel(R) Itanium Processor
EFI 1.10 IA-64 FOUNDATION XPEAK 1.22 [Tue May 14 16:37:12 2002] - HP
Secondary UUID is undefined
Do you want to copy the valid UUID to the new board?
(y/[n]) 2 0 0x0002F2 0x0000000000000000 UUID was set to valid value
```

This indicates you have successfully assigned the system board UUID to the status panel.

NOTE: If resetting the UUID does not work successfully, contact your HP support representative.

Processor

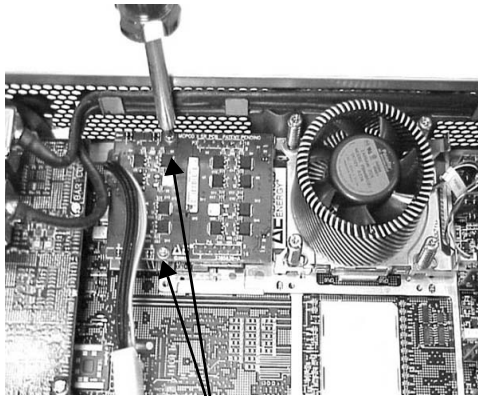
If there are two processors on the system board, the procedure for removing them is the same.



CAUTION: You must **disconnect all power** and follow the correct sequence of steps provided in this section to avoid serious damage to the system.

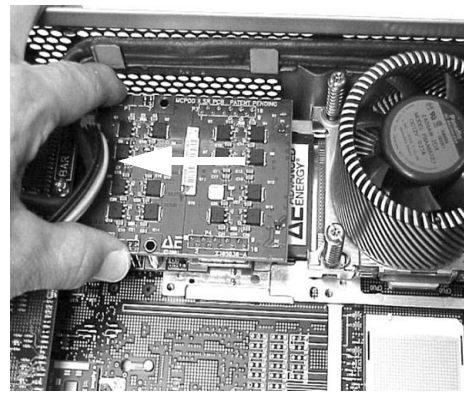
Removing a Processor

1. Turn off the system, **disconnect all power** and external cables and remove the system cover(s).
2. Remove the processor airflow guide and cables.
3. Unscrew the processor power pod mounting screws (1) and disconnect the module from its processor by sliding it toward the back of the system chassis (2).



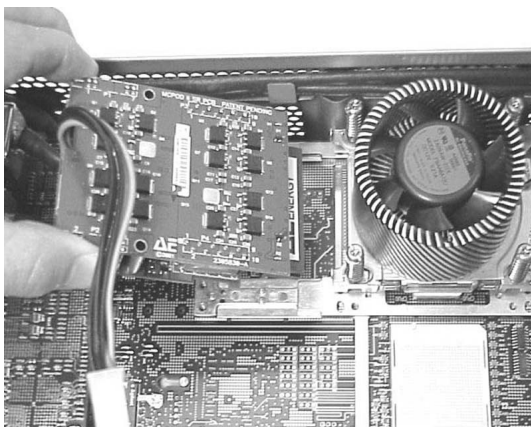
1

Disconnect the Processor Power Pod



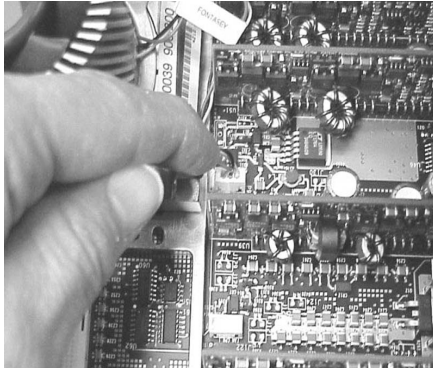
2

4. Remove the processor power pod from the system.



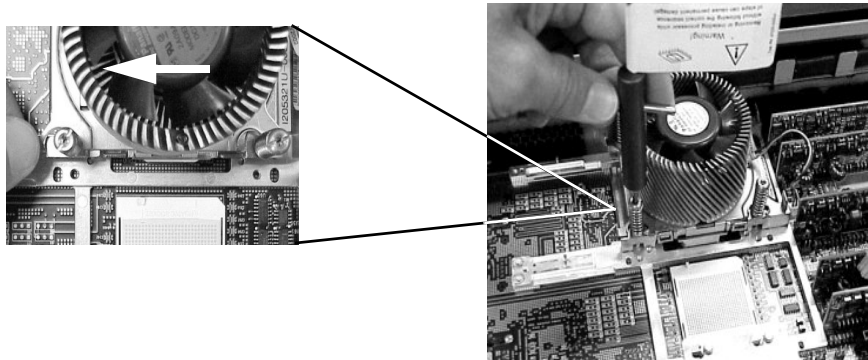
Remove the Processor Power Pod

5. Disconnect the power cable for the processor turbo fan.



Disconnect the Power Cable for the Processor Turbo Fan

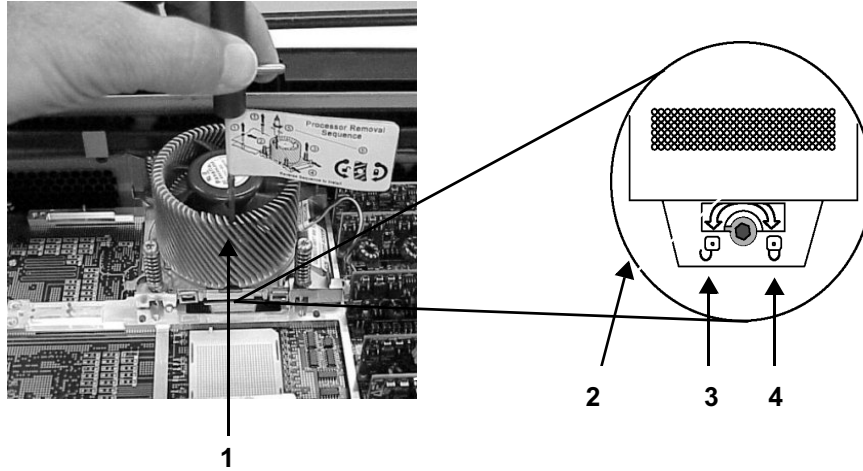
6. Unscrew the four heatsink captive screws using the special processor tool (HP Part Number A7231-67046).
 - ❑ Slide the sequencing retainer plate toward the back of the system to open the hole in the edge of the turbo fan heatsink for insertion of the special processor tool into the processor locking mechanism.



Unscrew the Turbo Fan Heatsink Captive Screws

7. Unlock the processor locking mechanism using the special processor tool shipped with your replacement processor assembly.

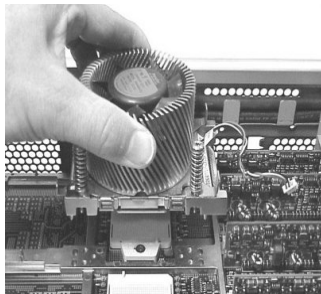
Insert the tool into the hole that runs down through the edge of the turbo fan heatsink and rotate the special processor tool 180 degrees counterclockwise.



Unlocking the Processor Locking Mechanism with the Special Processor Tool

- | | |
|----------|---|
| 1 | Insert special processor tool here |
| 2 | The special processor tool rotates this lock underneath the heat sink |
| 3 | Unlocked |
| 4 | Locked |

8. Remove the turbo fan heatsink and processor from the system.

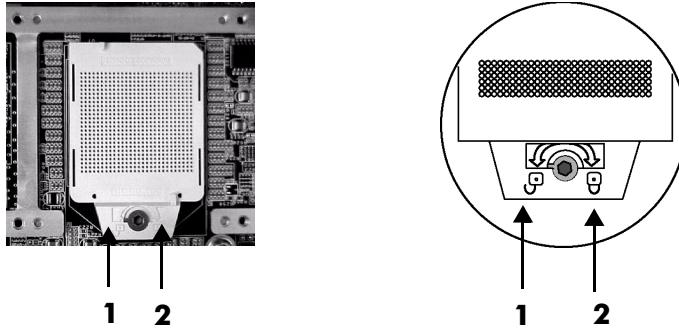


Removing the Turbo Fan Heatsink and the Processor

Replacing or Installing a Processor

You **must** have a processor in socket CPU0 before installing one in socket CPU1.

1. If you are installing a second processor, turn off the system, disconnect all power and external cables and remove the system cover(s).
2. If you are replacing a processor, remove the old processor.
3. Ensure that the processor locking mechanism is rotated into the unlocked position.



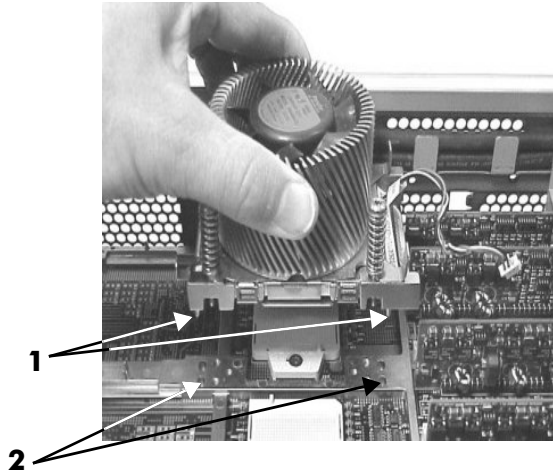
Processor Locking Mechanism

1 **Unlocked**

2 **Locked**

4. Check to ensure that no processor pin is bent.

5. Use the four locator posts on the heatsink and the turbo fan power cable to properly align the fan and processor assembly on the system board. The four locator posts will fit in locator holes on the system board processor mount. The turbo fan power cable must be positioned so that it is located on the side of the heatsink that faces the front of the system.

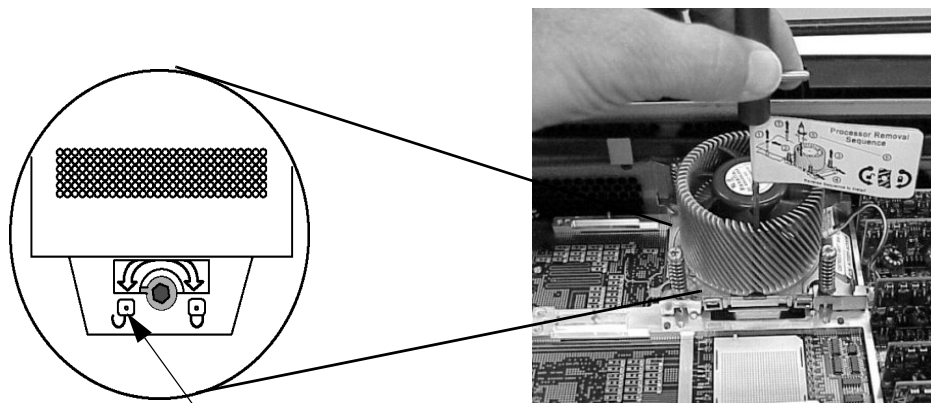


Aligning the Turbo Fan and Processor Assembly

1 Locator Posts

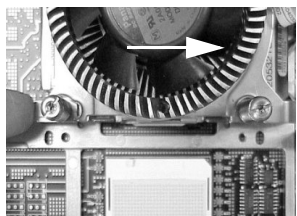
2 Locator Holes

6. Use the special processor tool shipped with your replacement processor assembly to lock the processor in place on the system board. To do this, insert the special processor tool into the hole that runs down the side of the heatsink and rotate it clockwise 180 degrees.



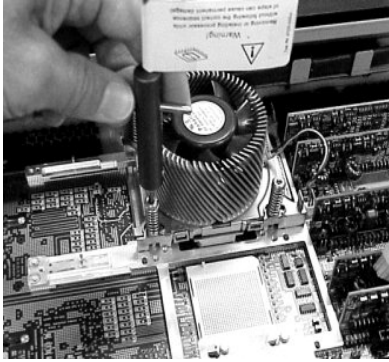
Locking the Processor in Place

7. Slide the sequencing retainer plate toward the front of the system.



Sliding Sequencer Retainer

8. Screw in the four heatsink captive screws.



Screw in the Heatsink and Processor Screws

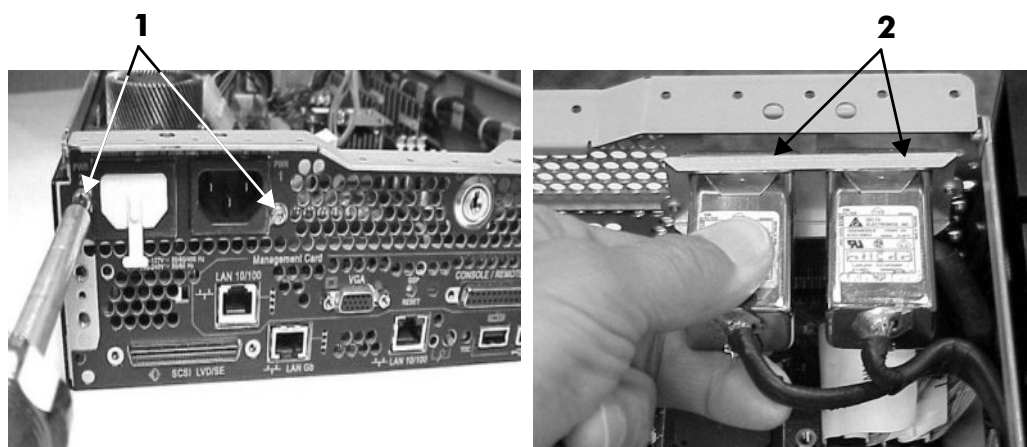
9. Connect the power cable for the processor turbo fan to its connector on the system board.
10. Slide the processor power pod on the system board metal mounting bracket so that the processor power pod connects to the processor. Align the two mounting screw holes on the processor power pod with the holes on the system board metal mounting bracket. Screw in the processor power pod mounting screws.
11. Replace the processor airflow guide, connect the power cable and turn on the system.
12. Verify that the processor works:
 - Run the **info cpu** command at the EFI shell prompt (page 3-7) or,
 - On systems with firmware version 2.0 or higher, check the configuration using the EFI **System Configuration menu** (page 3-22).

System Board

CAUTION: Some system settings are saved to the LED status panel. If you are replacing **both** the LED status panel and the system board, they must be replaced one at a time to avoid loss of system settings. First replace one component, then turn on the system and boot to the EFI prompt. After confirming that the first component has been replaced successfully, shut down the system and replace the second component.

Removing the System Board

1. Turn off the system, disconnect all power and external cables and remove the system cover(s).
2. Remove these components from the system board:
 - Memory
 - System fans
 - PCI/AGP card cage
 - Processor airflow guide and processor(s)
 - MP card (if installed)
3. If the system does **not** have an MP card installed, remove the power connector plate.
 - a. Unscrew the two power connector mounting screws on the back of the system (1), and reach inside the system to remove the power connectors from the socket (2). The power connectors will still be connected to their cables.



Removing the Power Connector Plate

4. Unscrew the six backplane system board mounting screws that connect the system board to the rear of the system chassis.

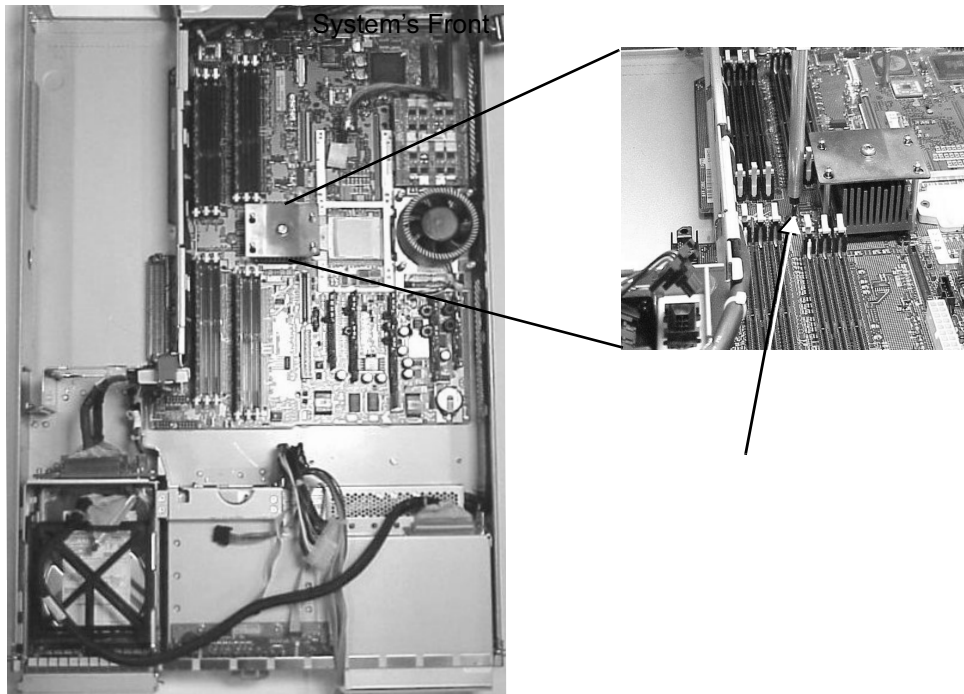


Six System Board Mounting Screws

5. Disconnect all cables that are connected to the system board. To help with re-assembly, make note of which cables were connected to which connector.

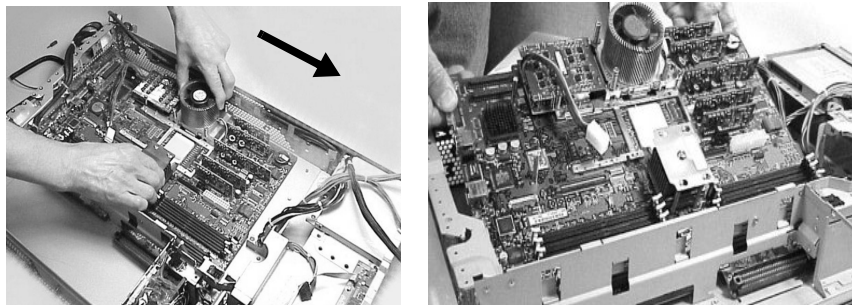
NOTE: To access the three power cables near the PCI/AGP cage, you must lift up the connector bridge for the PCI/AGP cage fan.

6. Unscrew the system board mounting screw. A screw symbol is adjacent to the mounting screw.



Unscrew the System Board Mounting Screw

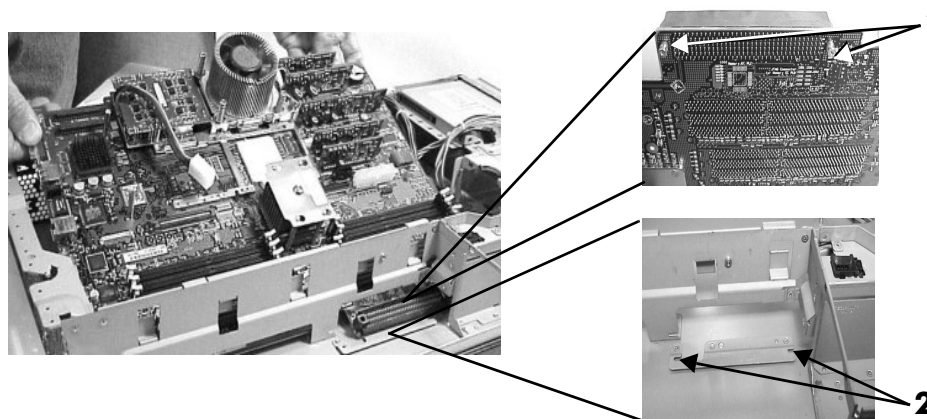
7. Remove the system board:
 - a. Grasp the memory controller chip heatsink and the processor heatsink and slide the system board toward the front of the system. This releases the system board from its chassis standoffs.
 - b. Lift up the processor side of the system board and slide it free of the PCI/AGP cage bay.



Remove the System Board from the System

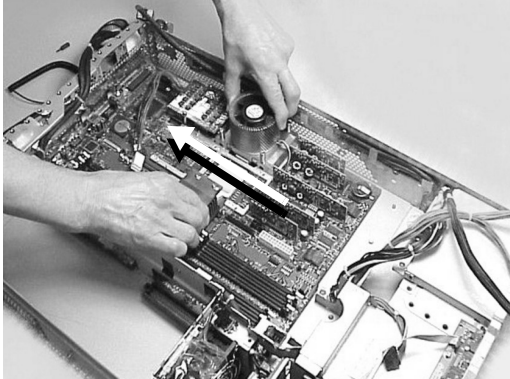
Replacing the System Board

1. Remove the old system board.
2. Grasp the new system board by its edges and carefully align it in the system:
 - ❑ Angle the board to allow the PCI connector to slide into the PCI/AGP cage bay area.
 - ❑ Align the system board keyholes with their corresponding standoffs on the chassis.
 - ❑ Slide the PCI connector posts (1) on the system board into their slots (2) on the system chassis.



Align the System Board in the System

- Slide the system board back toward the rear of the system to secure the system board on its standoffs.



Secure the System Board on its Standoffs

- Screw in the system board mounting screw.
- Connect all cables to their appropriate connectors on the system board.
- Screw in the six rear backplane system board mounting screws.
- If your system does not have an MP card, replace the power connectors in their slots on the back of the system and screw in the power connector mounting screws.
- Replace the following system components:
 - MP card
 - Processor airflow guide
 - System fans
 - PCI/AGP card cage
 - Memory
- Replace the system cover(s), reconnect all of the power and external cables and turn on the system.
- Verify that the processor works:
 - Run the **info cpu** command at the EFI shell prompt (page 3-7) or,
 - On systems with firmware version 2.0 or higher, check the configuration using the EFI **System Configuration menu** (page 3-22).
- Review the system configuration in the EFI shell and reconfigure settings as necessary.

System Batteries

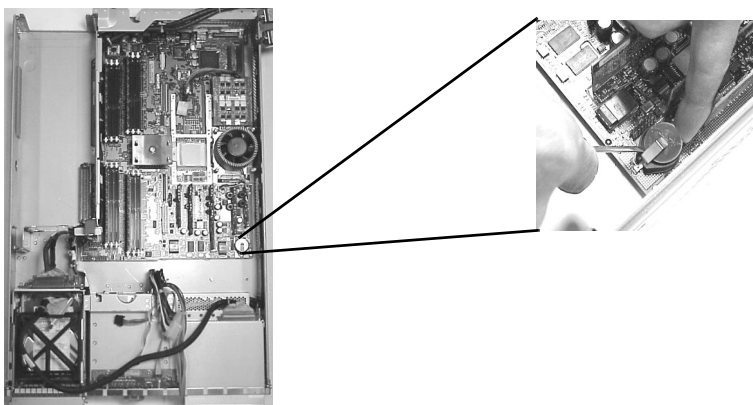
Systems with a MP card have two batteries. Systems with no MP Card have only one battery.

Removing the System Battery

1. Turn off the system, disconnect all power and external cables and remove the system cover(s).
2. Remove the processor airflow guide.
3. Lift up on the battery and push on the back of it with a flat-head screwdriver to remove the battery from its holder.




CAUTION: Lift the battery just high enough to clear its holder. Too much stress on the battery holder retaining clip may break it.



Remove the System Board Battery

Replacing the System Battery

1. Lift up on the battery holder retaining clip with a flat-head screwdriver and slide the battery into its holder. The positive (+) side of the battery should face up.

 **CAUTION:** Lift the battery just high enough to clear its holder. Too much stress on the battery holder retaining clip may break it.

2. Replace the processor airflow guide.
3. Replace the system cover(s), reconnect all of the power and external cables and turn on the system.


Verify that the battery has been installed correctly:

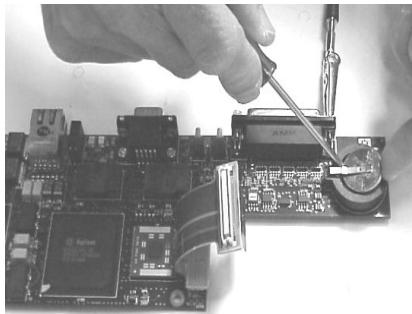
- Run the **time** and **date** commands at the EFI shell prompt (page 3-7) or,
- On systems with firmware version 2.0 or higher, adjust the time and date settings using the EFI **System Configuration menu** (page 3-22).

You may need to reset the system time and date using the EFI `time` and `date` commands. Once you have set the time, turn the system off, unplug the power cord, and wait for a minute before turning it back on. Execute the `time` and `date` commands again. If the time and date are now correct, you have installed the battery correctly.

Removing the MP Card Battery

1. Remove the MP card from the system.
2. Lift up on the battery and push on the back of it with a small flat-head screwdriver. This will remove the battery from its holder.


 **CAUTION:** Lift the battery just high enough to clear its holder. Too much stress on the battery holder retaining clip may break it.



Remove the MP card's Battery

Replacing the MP Card Battery

1. Lift up on the battery holder retaining clip with a small flat-head screwdriver and slide the battery into its holder. The positive (+) side of the battery should face up.

 **CAUTION:** Lift the battery just high enough to clear its holder. Too much stress on the battery holder retaining clip may break it.

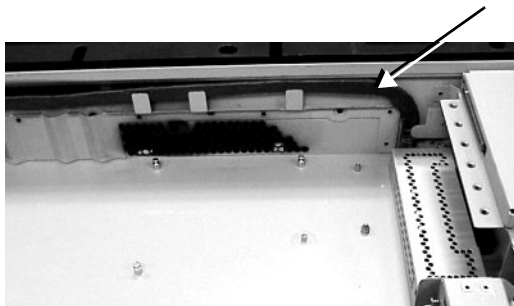
2. Re-install the MP card in the system.
3. Replace the system cover(s), and reconnect all of the power and external cables.

Power Supply Interface Module

The power supply interface (PSI) module supports up to two redundant power supplies.

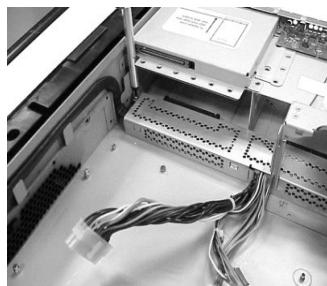
Removing the Power Supply Interface

1. Turn off the system, disconnect all power and external cables, and remove the system cover(s).
2. Remove the system board.
3. Lift the power cables out of their metal holding clips.

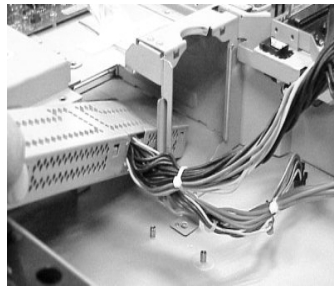


Power Cables and Holding Clips

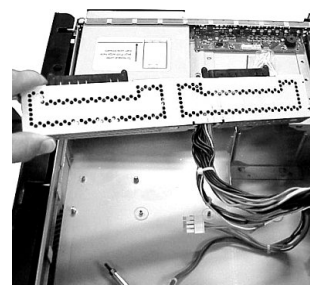
4. Unscrew the PSI mounting screw and remove the PSI module from the system.



1



2



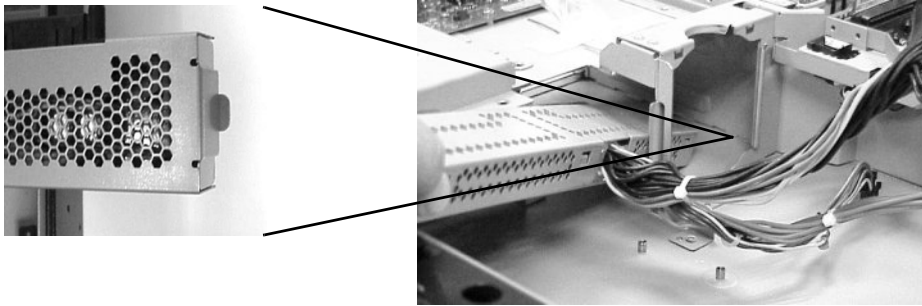
3

Removing the Power Supply Interface Module

- | | |
|----------|--------------------------|
| 1 | Remove Mounting Screw |
| 2 | Slide PSI out of Chassis |
| 3 | PSI Removed from System |

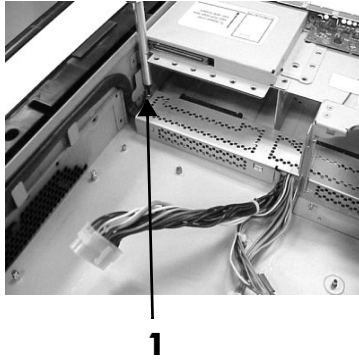
Replacing the Power Supply Interface Module

1. Place the PSI module into the chassis by sliding the module retaining tab into the slot on the hard disk drive bay wall.

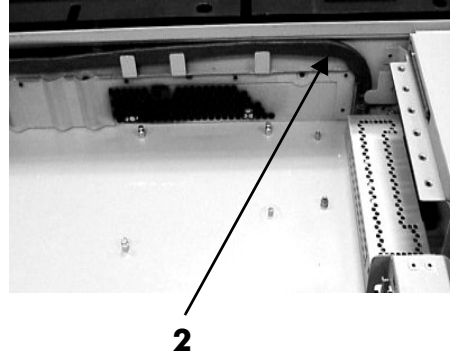


Replacing the Power Supply Interface Module

2. Screw in the PSI module mounting screw (1) and secure the power cables behind the holding clips (2).



1



2

Securing the Power Supply Interface Module and Cables

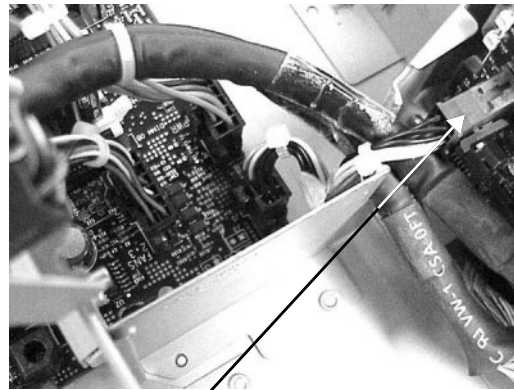
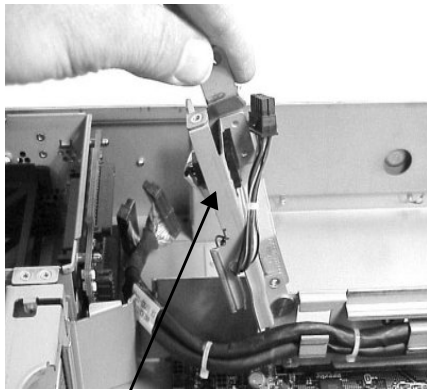
3. Replace the system board.
4. Replace the system cover(s), and reconnect all of the power and external cables.

Hard Drive Backplane

The hard drive backplane provides connectors for three hard disk drives.

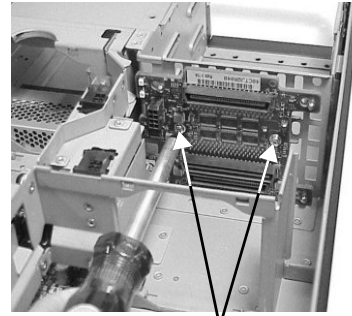
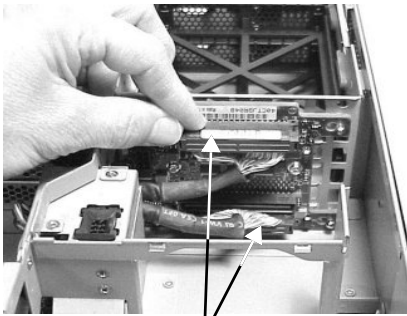
Removing the Hard Drive Backplane

1. Turn off the system, disconnect all power and external cables, and remove the system cover(s).
2. Lift up on the PCI/AGP cage release lever and the back edge of the PCI/AGP cage and lift the PCI/AGP cage out of the system.
3. Lift up on the fan power bridge (1) and disconnect the backplane power cable (2).



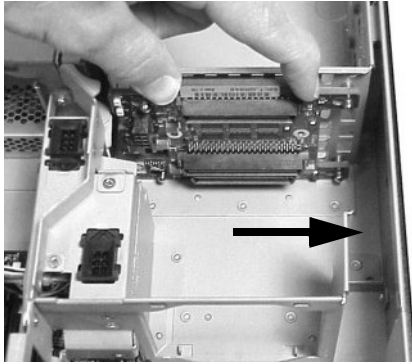
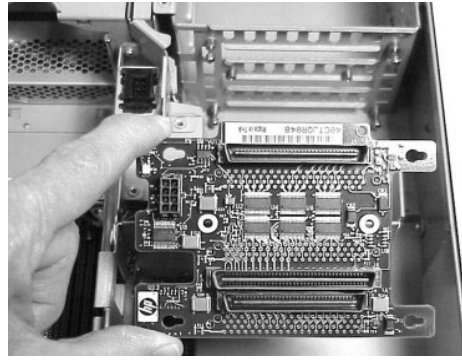
Disconnect the Fan and Backplane Power Cables

4. Disconnect the SCSI cables (1) and unscrew the backplane mounting screws (2).



Unscrewing the Backplane Mounting Screws

5. Remove the hard drive backplane by sliding it in the direction of the arrow (1) and pulling it outward from its standoff posts (2).

**1***Remove the Hard Drive Backplane***2**

Replacing the Hard Drive Backplane

1. Insert the hard drive backplane onto its four chassis standoffs and slide it to the left as you face it. This locks the hard drive backplane in place.
2. Screw in the two backplane mounting screws and connect the two SCSI cables.
3. Connect the backplane power cable and lower the fan power bridge until it snaps in place.
4. Replace the PCI/AGP cage in the system and secure it.
5. Replace the system cover(s), and reconnect all of the power and external cables.

System Configuration

This chapter covers the tools available for configuring rx2600 and zx6000 systems:

- Extensible Firmware Interface (EFI)
- Management Processor (MP)
- Baseboard Management Controller (BMC)
- Firmware Upgrades

Extensible Firmware Interface (EFI)

The Extensible Firmware Interface (EFI) is an interface between the operating systems and the system firmware.

The following topics introduce you to the EFI and explain how to use it to configure your system:

- “Accessing the EFI” on page 3-2
- “Using the EFI shell” on page 3-4
- “Using the Boot Option Maintenance Menu” on page 3-12
- “Using the System Configuration Menu” on page 3-22
- “Using the Security/Password Menu” on page 3-25

The EFI is an interface that allows you to configure the Itanium Processor Family (IPF) firmware. The EFI menu includes the following options:

- The **EFI Shell [Built-in]** is a command line interface that allows you to operate the EFI commands or create and run automated scripts.
- **Boot Option Maintenance Menu** allows you to select the order of the devices from which you want the firmware to attempt to boot the OS. You can also configure the system to boot from a configuration file.
- **System Configuration Menu** on systems with *EFI firmware version 2.0 or higher* lets you view the system configuration and change or delete administrator and user passwords.
- **Security/Password Menu** on systems with *EFI firmware version 1.9 or lower* lets you add, change and delete system administrator and user passwords.

Accessing the EFI

You can access the EFI directly when you boot the system, or by remote access.

NOTE: To switch between the MP card and EFI console with *MP firmware E.02.20 or higher* (see "Accessing the MP," page 3-29):

- If you are at the EFI console, press **Ctrl-B** to access the MP login screen.
 - If you are at the MP command prompt, execute the **CO** command to enter EFI console mode.
-

Direct Access

When you turn on your system and it begins to start up, your system pauses at the **boot option** screen:

```
EFI Boot Manager ver x.xx [xx.xx]

Please select a boot option

    [your OS]
    EFI Shell [Built-in]
    Boot option maintenance menu
    Security/Password Menu
```

Use up and down arrows to change option(s).

Use Enter to select an option.

NOTE: The system pauses for seven seconds to allow you to change the boot option before booting to the default OS. To change the pause duration, select **Set Auto Boot TimeOut** from the **Boot Options Maintenance Menu** (page 3-12).

Use the up or down arrow keys to highlight an option, then press **Enter** to activate a selection.

Remote Access

To access the EFI remotely:

1. With the system turned off, connect the serial cable provided with your system (HP part number 5182-4794) or a compatible cable to *serial port A* on the rear panel of the system, and to your remote device.
2. Configure the terminal emulation software with these settings:
 - Baud rate: 9600
 - Bits: 8
 - Parity: None
 - Stop Bits: 1 (one)
 - Flow Control: XON/XOFF
3. Using the terminal emulation software, connect to the system with a *direct connection*.

NOTE: The default terminal emulation type is VT100+. This setting can be changed from the EFI **Boot Options Maintenance Menu**.

4. Turn on the system and follow the steps in the next section to access the EFI.

Using the EFI shell

To access the EFI shell:

1. When the EFI boot option screen displays, use the arrow keys to highlight **EFI Shell**, then press **Enter**.

NOTE: You have 7 seconds to change the boot option before the system boots to the first option in the list. To change the order of boot options, see “Using the Boot Option Maintenance Menu” on page 3-12.

2. A list of *file systems* (drives and partitions), and *block devices* on hard drives is displayed. For example:

Device mapping table

```
fs0:
Acpi (HWP0002,100)/Pci (1|0)/Scsi (Pun0,Lun0)/HD (Part1,Sig00112233)
blk0: Acpi (HWP0002,0)/Pci (2|0)/Ata (Primary,Master)
blk1: Acpi (HWP0002,100)/Pci (1|0)/Scsi (Pun0,Lun0)
```

3. The EFI shell first searches for an optional script file named `startup.nsh`.
 - If this file is found, it is executed automatically.
 - After the script runs, the shell waits for commands to be entered at the command prompt.

NOTE: If `startup.nsh` runs an OS or application, you must exit that application to access the EFI shell prompt.

4. You can now enter commands.

- To run an individual command:
 - a. Type the command at the shell prompt. For example, to clear the display on the monitor:

```
Shell:\> cls
```

- b. Press **Enter** to execute the command.
 - ◆ Some commands require additional arguments to further define their action. For example, to display information about the system memory, you must type the command name, plus the desired category of information to display:

```
fs0:\> info mem
```

- When you enter individual commands at the command prompt, the shell performs variable substitution, then expands wild cards before the command is executed.
- To switch to a different file system, execute the following, where `fsx` is the selected file system as listed on the screen (see step 2). For example:

```
Shell> fsx:
```

where `x` is a numeric value representing a file system. For example, if you enter:

```
Shell> fs0:
```

You see this prompt:

```
fs0:\> _
```

- ❑ You also can run EFI applications (files ending with **.efi**). To list applications in the current file system, run the **ls** command. For example:

```
fs0:> ls
```

You will see a list of applications on the fs0 file system.

Command Syntax

The EFI shell uses a programming language to control the execution of individual commands. Some characters have special meanings in the EFI shell. This section includes instructions for running EFI shell commands and a list of the available commands.

Arguments

Some commands require additional *arguments* to further define their action. For example, to display information about the system memory, you must type the command name, plus the desired category of information to display:

```
fs0:\> info mem
```

Rules

Follow these rules or the commands will not run correctly.

- #** Denotes a *comment*. All text from the **#** symbol to the end of the line is ignored.
- >** Denotes an *output redirect*. Output of EFI shell commands can be saved to files instead of being displayed on the monitor or in the terminal emulation program. The shell redirects standard output to a single file and standard error to a single file. Redirecting both standard output and standard error to the same file is allowed. Redirecting to more than one file on the same command is not supported.

The output redirect options, include:

- >** redirect output to a unicode file
- >a** redirect output to an ASCII file
- >>** append output to a unicode file
- >>a** append output to an ASCII file

The syntax for redirecting script output is:

Command > output_file_pathname

- %** Denotes an *environment variable*. Environment variables can be set and viewed through the use of the **set** command (see **set** command in this chapter). To access the value of an environment variable as an argument to a shell command, delimit the name of the variable with the **%** character before and after the variable name; for example, **%myvariable%**.
- *** Denotes a *wildcard* character. Matches zero or more characters in a file name.
- ?** Denotes a *wildcard* character. Matches exactly one character of a file name.

[Denotes a <i>wildcard</i> character. Defines a set of characters; the pattern matches any single character in the set. Characters in the set are not separated. Ranges of characters can be specified by specifying the first character in a range, then the - character, then the last character in the range. For example: [a-zA-Z]
^	Denotes a <i>literal argument</i> . When a command contains a defined alias the shell replaces the alias with its definition (see alias command in this chapter). If the argument is prefixed with the ^ character, however, the argument is treated as a literal argument and alias processing is not performed.
""	Quotation marks in the EFI shell are used for argument grouping. A quoted string is treated as a single argument to a command, and any white space characters included in the quoted string are just part of that single argument. Quoting an environment variable does not have any effect on the de-referencing of that variable. Double quotation marks (“”) denote strings. Single quotation marks are not treated specially by the shell in any way. Empty strings are treated as valid command line arguments.
space	Used to format batch scripts to separate command names, parameters and so forth.
newline	Used to format batch scripts. Each line represents a new command.

Command Descriptions

The following sections provide brief descriptions of the EFI commands. For more information, use the EFI shell help system. To access a:

- List of EFI command classes, execute `help` at the EFI shell prompt.
- Detailed description of a command, execute `help` and the command name or other options at the EFI shell prompt. For example:
 - `fs0:\> help` displays a list of command classes
 - `fs0:\> help date` displays help for the **date** command
 - `fs0:\> help -a` displays all commands in alphabetical order
 - `fs0:\> help -a -b` displays all commands in alphabetical order with page breaks
 - `fs0:\> help class` displays all commands in the specified command class (see below)

Command Classes

EFI commands are organized into different classes based on their functions. The classes include:

<code>boot</code>	Boot options and disk-related commands
<code>configuration</code>	Change and retrieve system information
<code>device</code>	Get device, driver and handle information
<code>memory</code>	Memory related commands
<code>shell</code>	Basic shell navigation and customization
<code>scripts</code>	EFI shell script commands

Boot Commands

These let you set boot and disk options.

<code>autoboot</code>	View or set autoboot timeout variable
<code>bcfg</code>	Display/modify the driver/boot configuration
<code>dblkl</code>	Display the contents of blocks from a block device
<code>boottest</code>	Set/view BootTest bits
<code>mount</code>	Mount a file system on a block device
<code>reset</code>	Reset the system
<code>vol</code>	Display volume information of the file system

Configuration Commands

These let you change and retrieve system information.

<code>cpuconfig</code>	Deconfigure or reconfigure CPUs
<code>date</code>	Display the current date or sets the date in the system; format is mm/dd/yyyy
<code>err</code>	Display or change the error level
<code>errdump</code>	View/clear logs

info	Display hardware information
monarch	View or set the monarch processor
palproc	Make a PAL procedure call
salproc	Make a SAL procedure call
time	Display the current time or sets the system time; format is hh:mm:ss
ver	Display the version information

Device Commands

These provide device, driver and handle information.

baud	Set serial port settings
connect	Bind an EFI driver to a device and start the driver
devices	Display the list of devices being managed by EFI drivers
devtree	Display the tree of devices that follow the EFI Driver Model
disconnect	Disconnect one or more drivers from a device
dh	Display the handles in the EFI environment
driver	List and install ROM-based drivers
drivers	Display the list of drivers that follow the EFI Driver Model
drvcfg	Invoke the Driver Configuration Protocol
drvdiag	Invoke the Driver Diagnostics Protocol
guid	Display all the GUIDs in the EFI environment
lanaddress	Display core I/O MAC address
load	Load and optionally connect EFI drivers
loadpcirom	Load a PCI Option ROM
map	Display or define mappings
openinfo	Display the protocols on a handle and the agents
pci	Display PCI devices or PCI function configuration space
reconnect	Reconnect one or more drivers from a device
unload	Unload a protocol image

Memory Commands

These let you manage your memory.

default	Reset all NVM values to system defaults
dmpstore	Display all NVRAM variables
dmem	Display the contents of memory
memmap	Display the memory map
mm	Display or modify memory, memory-mapped IO and PCI settings
pdt	View or clear the Page Deallocation Table (PDT)

Shell Commands

These let you navigate and customize your shell.

alias	Display, create, or deletes aliases in the EFI shell
attrib	Display or change the attributes of files or directories
cd	Display or change the current directory
cls	Clear the standard output with an optional background color
comp	Compare the contents of two files
cp	Copy one or more files/directories to another location
edit	Edit an ASCII or UNICODE file in full screen
eficompress	Compress a file
efidecompress	Uncompress a file
exit	Exit the EFI shell
help	Display help menus, command list, or verbose help of a command
hexedit	Edit with hex mode in full screen
ls	Display a list of files and subdirectories in a directory
mkdir	Create one or more directories
mode	Display or change the mode of the console output device
mv	Move one or more files/directories to destination
rm	Delete one or more files or directories
set	Display, create, change or delete EFI environment variables
setsize	Set the size of the file
touch	Update time with current time
type	Display the contents of a file
xchar	Turn on/off extended character features

Scripts Commands

These let you use shell scripts.

echo	Display messages or turn command echoing on or off
for/endfor	Execute commands for each item in a set of items
goto	Make batch file execution jump to another location
if/endif	Execute commands in specified conditions
pause	Print a message and suspends for keyboard input
stall	Stalls the processor for the specified time in microseconds

EFI Scripts

The EFI scripting language allows you to create executable shell scripts. You can place a set of EFI commands in the shell script, then execute the script as often as needed. You also can modify the script to make it perform different tasks. Script files can be either unicode or ASCII format.

NOTE: Commands executed from a batch script are not saved by the shell for DOSkey history (up-arrow command recall).

The optional script `startup.nsh` is automatically executed when you enter the EFI shell environment. All EFI shell scripts have the `.nsh` suffix.

This section provides a brief explanation of how to create, edit and run an EFI shell script.

To create or edit a shell script:

1. At the EFI shell prompt, run the shell's editor. Execute:

```
fs0:\> edit file.nsh
```

where *file.nsh* represents the name of the new shell script you are creating or the existing script you want to edit.

2. Type or edit the commands to be executed when the script is run. For example:

```
echo This is a test file.
```

3. When you are finished writing the script: press **F2** to save the file, then press **F3** to exit.

The EFI editor is controlled by function key commands. A menu of available commands is shown at the bottom of the screen. If you are accessing the editor through a terminal emulator and the function keys do not work, use the escape sequences listed here.

Command	Function key	Escape sequence
Open file	F1	Esc O
Save file	F2	Esc S
Exit	F3	Esc Q
Cut	F4	Esc D
Paste	F5	Esc P
Goto	F6	Esc G
Search	F7	Esc F
Replace	F8	Esc R
File type	F9	Esc T

To run a shell script:

1. Type the name of the command at the EFI shell prompt. For example:

```
fs0:\> mytest.nsh
```

2. Press **Enter**.

Positional Arguments

Up to nine positional arguments are supported for batch scripts. Positional argument substitution is performed before the execution of each line in the script file. Positional arguments are denoted by **%n**, where **n** is a digit between 0 and 9. By convention, **%0** is the name of the script file currently being executed.

In batch scripts, argument substitution is performed first, then variable substitution. Thus, for a variable containing **%2**, the variable will be replaced with the literal string **%2**, not the second argument on the command line. If no real argument is found to substitute for a positional argument, then the positional argument is ignored.

For example, this script replaces the two literal arguments **arg1** and **arg2** with the positional arguments **%1** and **%2**:

```
#
# Example: EFI Shell Script
#
#////////////////////////////////////
echo -off
set arg1 %1
set arg2 %2
echo "I found a %arg1%"
echo "I also found a %arg2%"
```

To run the command, type the command name followed by the arguments at the shell prompt:

```
fs0:\efi\tools> example cat dog
example> echo -off
I found a cat
I also found a dog
```

Nesting

Script file execution can be nested; that is, script files may be executed from within other script files. Recursion is allowed.

Output Redirection

Output redirection is fully supported. Output redirection on a command in a script file causes the output for that command to be redirected. Output redirection on the invocation of a batch script causes the output for all commands in the batch script to be redirected to the file, with the output of each command appended to the end of the file.

By default, both the input and output for all commands executed from a batch script are echoed to the console. Display of commands read from a batch file can be suppressed via the **echo -off** command (see **echo**). If output for a command is redirected to a file, then that output is not displayed on the console.

Error Handling in Scripts

By default, if an error is encountered during the execution of a command in a batch script, the script will continue to execute. The **lasterror** shell variable allows batch scripts to test the results of the most recently executed command using the **if** command. This variable is not an environment variable, but is a special variable maintained by the shell for the lifetime of that instance of the shell.

Comments in Script Files

Comments can be embedded in batch scripts. The **#** character on a line denotes that all characters on the same line and to the right of the **#** are to be ignored by the shell. Comments are not echoed to the console.

Using the Boot Option Maintenance Menu

This menu allows you to select console output and input devices as well as various boot options. It contains the following items:

- **Boot from a File**
- **Add a Boot Option**
- **Delete Boot Option(s)**
- **Change Boot Order**
- **Manage BootNext setting**
- **Set Auto Boot TimeOut**
- **Select Active Console Output Devices**
- **Select Active Console Input Devices**
- **Select Active Standard Error Devices**
- **Cold Reset**
- **Exit**

These items are described in the following sections.

In all menus, select:

- **Help** to display the help available for the command
- **Exit** to return to the main Boot Options Maintenance menu
- **Enter** to select an item after using the arrow keys to highlight the item
- **Save Settings to NVRAM** to save your changes

NOTE: The options shown here are examples. Your system may have different options available based on the system configuration and installed hardware components.

Paths

All devices in the rx2600 and zx6000 are represented by *paths* in the EFI shell. To identify the correct slot or disk drive, use the following tables.

Integrity rx2600 server slots

Slot	Path	Description
1 PCI	Acpi(HWP0002,400)/pci(1 0)	Slot 1:0/4
2 PCI	Acpi(HWP0002,300)/pci(1 0)	Slot 2:0/3
3 PCI	Acpi(HWP0002,200)/pci(1 0)	Slot 3:0/2
4 PCI	Acpi(HWP0002,600)/pci(1 0)	Slot 4:0/5

zx6000 workstation slots

Slot	Path	Description
1 AGP	Acpi(HWP0003,400)/pci(0 0)	Slot 1:0/4 (upper rack slot)
2 PCI	Acpi(HWP0002,300)/pci(1 0)	Slot 2:0/3
3 PCI	Acpi(HWP0002,200)/pci(1 0)	Slot 3:0/2
4 PCI	Acpi(HWP0002,600)/pci(1 0)	Slot 4:0/5 (lower rack slot)

rx2600 and zx6000 drives

Drive	Path	Description
SCSI disk	Acpi(HWP0002,100)/Pci(1 0)/Scsi(Pun0,Lun0)	0/1/1/0.0.0 (lower disk)
SCSI disk	Acpi(HWP0002,100)/Pci(1 0)/Scsi(Pun1,Lun0)	0/1/1/0.1.0 (middle disk)
SCSI disk	Acpi(HWP0002,100)/Pci(1 1)/Scsi(Pun2,Lun0)	0/1/1/1.2.0 (upper disk)
Removable media boot	Acpi(HWP0002,0)/Pci(2 0)/Ata(Primary,Master)	

Boot from a File

Use this option to manually run a specific application or driver.

NOTE: This option boots the selected application or driver one time only. When you exit the application, you return to this menu.

This option displays the file systems that are on your system and lets you browse these file systems for applications or drivers that are executable. Executable files end with the **.efi** extension. You can also select remote boot (LAN) options that have been configured on your network.

For example:

```
Boot From a File. Select a Volume
NO VOLUME LABEL [Acpi(HWP0002,500)/Pci(2|0)/Ata(Primary,Master)/
CD_FORMAT [Acpi(HWP0002,500)/Pci(2|0)/Ata(Secondary,Master)/CDRO
Removable Media Boot [Acpi(HWP0002,500)/Pci(2|0)/Ata(Secondary,M
Load File [EFI Shell [Built-in]]
Load File [Acpi(HWP0002,500)/Pci(3|0)/Mac(00306E385AFB)]
Exit
```

In this example:

- **NO VOLUME LABEL** is a hard drive. When you format a hard drive, the EFI tools provide an option to LABEL the disk. In this example, the volume was not labelled.
- **CD_FORMAT** is the label created for the disk currently inside the DVD-ROM drive.
- **Removable Media Boot** allows you to boot from a removable media drive (CD/DVD drive). This option does not support booting from a specific file on a specific removable media disc.
- The two **Load Files** are the EFI shell and the LAN.

Add a Boot Option

Use this option to add items to the EFI boot menu.

This option displays the file systems that are on your system and lets you browse these file systems for applications or drivers that are executable. Executable files end with the **.efi** extension. You can also select remote boot (LAN) options that have been configured on your network. The option you have selected will be added to the EFI boot menu.

If you add a new drive to your system, you must manually add its boot options list if you want to make it a bootable device.

When adding a boot option that already exists in the Boot Manager list of boot options, you can choose whether to create a new option or modify the existing one. If you:

- Choose to modify an existing option, you may change the boot option name and/or add boot option arguments to the existing option.
- Create a new boot option for an already existing option, multiple instances of the same boot option exist.

For example:

```
Add a Boot Option. Select a Volume
NO VOLUME LABEL [Acpi(HWP0002,500)/Pci(2|0)/Ata(Primary,Master) /
Removable Media Boot [Acpi(HWP0002,500)/Pci(2|0)/Ata(Secondary,M
Load File [EFI Shell [Built-in]]
Load File [Acpi(HWP0002,500)/Pci(3|0)/Mac(00306E385AFB)]
Exit
```

In this example:

- Most of the items are the same options in **Boot From a File**.
- **NO VOLUME LABEL** is a hard drive. You can search through the disk for bootable applications to add to the Boot Manager list of Boot options.
- **Removable Media Boot** will treat the Removable Media (generally a CD) as a bootable device.
- **Load File EFI Shell** adds a new instance to the EFI Shell. Load File with the MAC address adds a network boot option.

Delete Boot Option(s)

Use this option to remove boot options from the EFI boot menu.

NOTE: This does *not* delete any files, applications or drivers from your system.

This option displays a list of boot options that are configured on your system. The names will match the options on the main Boot Manager menu (above).

If you remove a drive from your system, you must manually delete it from the boot options list.

- To delete an item from the list, use the arrow keys to highlight the item and press **Enter**.
- To remove all of the entries from the EFI boot menu, select **Delete All Boot Options**. This setting may be used as a security device on systems that are accessed remotely.

Change Boot Order

Use this option to change the order of boot options. The order in which options are listed in the EFI boot menu also reflects the order in which the system attempts to boot. If the first boot option fails, the system tries booting the second, then the third, and so forth, until a boot option succeeds or until all options have failed.

For example, if you normally boot using a configuration on your LAN but would like to boot from a local hard drive if the LAN is unavailable, move the LAN boot option to the top of the list, followed by the hard drive boot option.

The menu lists boot options that currently exist in the main Boot Manager menu. You can change the priority of the items by moving them up or down in the list:

- Press **U** to move an option up.
- Press **D** to move an option down.
- Select **Save Settings to NVRAM** to modify the order in the Boot Manager menu, which modifies the order that the Boot Manager will attempt to boot the options.
- The items at the bottom of the screen (shown in bold in these examples) are descriptions of the selected option.

For example:

```
Change boot order. Select an Operation
```

```
EFI Shell [Built-in]
Current OS
Save Settings to NVRAM
Help
Exit
```

```
VenHw(D65A6B8C-71E5-4DF0-A909-F0D2992B5AA9)
```

```
Boot0000
```

Manage BootNext Setting

Use this option to run the selected boot option immediately upon entering the main Boot Manager menu. This option is useful for booting an option that only needs to be booted once, without changing any other setting in the main Boot Manager menu. This is a one-time operation and does not change the permanent system boot settings.

This option displays the file systems that are on your system and lets you browse these file systems for applications or drivers that are executable. Executable files end with the **.efi** extension. You can also select remote boot (LAN) options that have been configured on your network.

To restore the default boot next setting, select **Reset BootNext Setting**.

For example:

```
Manage BootNext setting. Select an Operation
EFI Shell [Built-in]
Current OS
Reset BootNext Setting
Save Settings to NVRAM
Help
Exit

VenHw(D65A6B8C-71E5-4DF0-A909-F0D2992B5AA9)
Boot0000
```

Set Auto Boot TimeOut

Use this option to set the amount of time the system pauses before attempting to launch the first item in the Boot Options list.

For example:

```
Set Auto Boot Timeout. Select an Option
Set Timeout Value
Delete/Disable Timeout
Help
Exit
```

Interrupting the timeout during the countdown stops the Boot Manager from loading any boot options automatically. If there is no countdown, boot options must be selected manually.

- To set the auto boot timeout value, in seconds, select **Set Timeout Value** and enter the desired value.
- To disable the timeout function, select **Delete/Disable Timeout**.

NOTE: When this option is selected, the system does not automatically boot. The system stops at the EFI boot menu and waits for user input.

Select Active Console Output Devices

Use this option to define the devices that display output from the system console. This list normally includes the VGA monitor and a serial port for directing output to a terminal emulation package.

NOTE: If you install a modem in your system, make sure you disable the modem serial port in both the *Active Console Input* and *Active Console Output* device lists.

NOTE: Some operating systems support multiple consoles, such as a simultaneous serial and VGA output. **See your OS documentation to determine how many consoles are supported with your system.** Multiple consoles are not supported for HP-UX or Windows (use the *Smart Setup CD* to switch between COM A and the MP on Windows systems).

For example:

```
Select the Console Output Device(s)
  Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (PcAnsi)
  Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100+)
  Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (VtUtf8)
  Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (PcAnsi)
  Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100)
* Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (Vt100+)
  Acpi (HWP0002,700) /Pci (1|1) /Uart (9600 N81) /VenMsg (VtUtf8)
  Acpi (HWP0002,700) /Pci (2|0)
* Acpi (HWP0003,0) /Pci (0|0)
Save Settings to NVRAM
Exit
```

* indicates a currently selected device.

This menu is identical to **Console Error Devices**. The zx6000/rx2600 does not support different configurations for Output and Error console. For correct operation:

- When changes are made to either Output or Error console menus, the identical change must be made in both menus.
- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

To select:	Choose:
Serial A/Serial 1	Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
MP Serial Console	Acpi(HWP0002,700)/Pci(1 1)/Uart(9600 N81)/VenMsg(Vt100+)
MP VGA Port	Acpi(HWP0002,700)/Pci(2 0)
AGP Graphics Port	Acpi(HWP0003,0)/Pci(0 0)

- Each option is identified with an EFI device path. Not all options will be available, depending on the configuration of the system and the options purchased. Device paths may differ slightly on different product models.
- On both serial device examples, UART 9600 indicates the current baud rate of the serial device (can be changed with the EFI shell **baud** command), VenMsg Vt100+ is the current emulation type (several different terminal emulation protocols are supported, see list above).
- Only one terminal emulation type (PcAnsi, Vt100, etc.) can be selected for each serial console, but multiple serial consoles can be selected at a time.
- Only one VGA (graphics) device can be selected at a time. You cannot select *both* the MP VGA port *and* an AGP graphics card.

Select Active Console Input Devices

Use this option to define the devices that are used to provide input to the system console.

This option displays the console devices on your system. This normally includes a standard keyboard and mouse, and a serial port for receiving output from a terminal emulation package on a laptop. Several different terminal emulation protocols are supported.

- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

NOTE: If you install a modem in your system, make sure you disable the modem serial port in both the *Active Console Input* and *Active Console Output* device lists.

NOTE: Some Operating Systems support multiple input devices, such as a simultaneous serial and keyboard input. **See your OS documentation to determine how many consoles are supported with your system.**

For example:

```
Select the Console Input Device(s)
    Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (PcAnsi)
    Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100)
    * Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (Vt100+)
    Acpi (PNP0501,0) /Uart (9600 N81) /VenMsg (VtUtf8)
    * Acpi (HWP002,500) /PCI (1|1) /Usb (1,0)

    Save Settings to NVRAM
    Exit

    Active Input Device. Hotplug USB keyboard.
    (Deselection feature disabled).
```

* indicates a currently selected device.

- On system with firmware version 2.0 or higher, the USB keyboard option is always active and cannot be deselected or disabled.
- Each option is identified with an EFI Device path. Not all options will be available, depending on the configuration of the system and the options purchased. Device paths may differ slightly on different product models.
- On both serial device examples, UART 9600 indicates the current baud rate of the serial device, VenMsg Vt100+ is the current emulation type. Several different terminal emulation protocols are supported (see list above).
- Only one terminal emulation type (such as PcAnsi or Vt100) can be selected for each serial console, but multiple serial consoles can be selected at a time.

To select:	Choose:
Serial A/Serial 1	Acpi(PNP0501,0)/Uart(9600 N81)/VenMsg(Vt100+)
MP serial console	Acpi(HWP0002,700)/Pci(1 1)/Uart(9600 N81)/VenMsg(Vt100+)
USB keyboard	Acpi(HWP0002,0)/Pci(1 0)

Select Active Standard Error Devices

Use this option to define the devices that display error messages from the system console.

This menu is identical to **Console Output Devices**. The zx6000/rx2600 does not support different configurations for Output and Error console. For correct operation:

- When changes are made to either Output or Error console menus, the identical change must be made in both menus.
- When changing serial devices, changes must be made to Output, Input, and Error menus for proper operation.

Using the System Configuration Menu

The **System Configuration Menu** (on systems with EFI firmware version 2.0 or higher) includes the following options:

- The **Security/Password Menu** lets you change the administrator and user passwords
- The **Advanced System Information Menu** displays information about system and component configuration
- **Set System Date** lets you modify the system date
- **Set System Time** lets you modify the system time
- **Reset Configuration to Default** lets you restore system settings to their original configuration
- **Help** displays additional information about the available options
- **Exit** returns to the EFI startup menu

Security/Password Menu

You can set administrator and user passwords to provide different levels of access to the system firmware:

- The Administrator can access and change all settings in the EFI Boot Manager program and can run the EFI shell.
- The User can access basic functions in the EFI Boot Manager.

NOTE: These are **not** OS passwords. These passwords limit access to the firmware interface only. For information on setting OS passwords, see your OS user guide.

To add, change or delete passwords:

1. Select **Security/Password Menu**.
2. Select either:
 - Set Administrator Options**
 - Set User Options**
3. Select:
 - Set Administrator Password** or **Set User Password** to set a new password
 - Enable/disable Password** to specify whether a password is required
 - Help** for assistance
4. When you are finished, select **Exit**.

Advanced System Configuration Menu

The **Advanced System Configuration Menu** can display a variety of information about your system configuration. The following examples show typical configurations, the exact information on each system is different.

■ All x Information

This options lists all of the information from the selections below in one screen.

■ System Information

```
Date/Time: May 14, 2003 13:00:43 (20:03:05:14:13:00:43)
Manufacturer: hp
Product Name: workstation zx6000
Product Number: A8081A
Serial Number: TS21600014
UUID: 31619E41-2DD2-11D7-BC2F-0735A1DF6599
System Bus Frequency: 200 MHz
```

■ Processor Information

```
# of L3 L4 Family/
CPU Logical Cache Cache Model Processor
Slot CPUs Speed Size Size (hex.) Rev State
-----
0 1 900 MHz 1.5 MB None 1F/00 B3 Active
```

■ Cache Information

See Processor Information, above.

■ Memory Information

```
---- DIMM A ----- DIMM B -----
DIMM Current DIMM Current
-----
0 256MB Active 256MB Active
1 256MB Active 256MB Active
Active Memory : 1024 MB
Installed Memory : 1024 MB
```

■ Bootable Devices Information

```
Order Media Type Path
-----
1 HARDDRIVE Acpi (HWP0002,500) /Pci (2|0) /Ata (Primary...
2 CDROM Acpi (HWP0002,500) /Pci (2|0) /Ata (Secondary...

Seg Bus Dev Fnc Vendor Device Slot
# # # # ID ID # Path
-----
00 A0 01 00 0x1033 0x0035 XX Acpi (HWP0002,500) /Pci (1|0)
00 A0 01 01 0x1033 0x0035 XX Acpi (HWP0002,500) /Pci (1|1)
00 A0 01 02 0x1033 0x00E0 XX Acpi (HWP0002,500) /Pci (1|2)
00 A0 02 00 0x1095 0x0649 XX Acpi (HWP0002,500) /Pci (2|0)
00 A0 03 00 0x8086 0x100E XX Acpi (HWP0002,500) /Pci (3|0)
00 A0 04 00 0x1319 0x0801 XX Acpi (HWP0002,500) /Pci (4|0)
00 A0 04 01 0x1319 0x0802 XX Acpi (HWP0002,500) /Pci (4|1)
```

■ Boot Information

```

Monarch CPU:
Current Preferred
Monarch Monarch Possible Warnings
-----
0 0
AutoBoot: ON - Timeout is : 7 sec
Boottest:
BOOTTEST Settings Default Variable
OS is not speedy boot aware.
Selftest Setting
-----
early_cpu Run this test
late_cpu Run this test
platform Run this test
chipset Run this test
io_hw Run this test
mem_init Run this test
mem_test Run this test
LAN Address Information:
LAN Address Path
-----
*Mac(00306E385AFB) Acpi(HWP0002,500)/Pci(3|0)/Mac(00306E385AFB)

```

■ Firmware Information

```

Firmware Revision: 2.00 [4320]
PAL_A Revision: 7.31/7.31
PAL_B Revision: 7.40
SAL Spec Revision: 3.01
SAL_A Revision: 2.00
SAL_B Revision: 2.00
EFI Spec Revision: 1.10
EFI Intel Drop Revision: 14.61
EFI Build Revision: 1.22
POSSE Revision: 0.10
ACPI Revision: 7.00
BMC Revision 1.50
IPMI Revision: 1.00
SMBIOS Revision: 2.3.2a
Management Processor Revision:

```

■ Warning and Stop Boot Information

Blank unless system faults have been identified. See Chapter 4, “Troubleshooting.”

■ Chip Revision Information

```

Chip Logical Device Chip
Type ID ID Revision
-----
Memory Controller 0 122b 0023
Root Bridge 0 1229 0023
Host Bridge 0000 122e 0032
Host Bridge 0004 122e 0032
Host Bridge 0005 122e 0032
Host Bridge 0006 122e 0032
Other Bridge 0 0 0002
Other Bridge 0 0 0007
Baseboard MC 0 0 0150

```

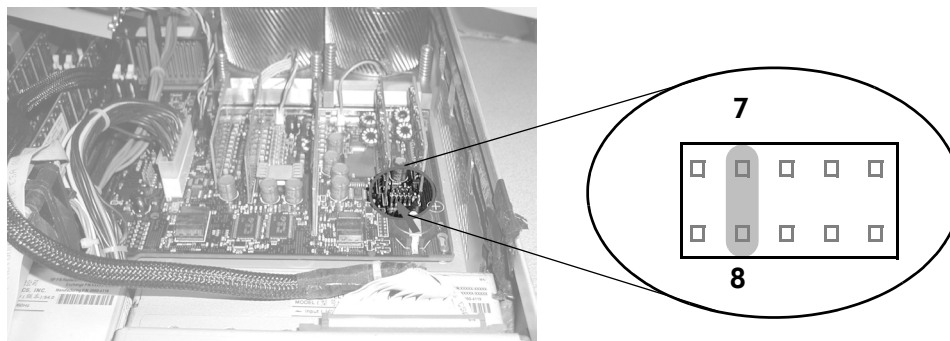
Using the Security/Password Menu

The **Security/Password Menu** (on systems with EFI firmware version 1.9 or lower) is identical to the security/password submenu of the **System Configuration Menu**. See page 3-22.

Resetting Passwords

If you forget a password, you can reset it with an MP command. Follow these steps.

- If your system has an MP card:
 - Run the MP card **bp** command to reset the administrator and user passwords (see “Using the MP Commands,” page 3-36).
- If your system does not have an MP card, you must reset the passwords using a jumper on the system board:
 - a. Power down the system and unplug the AC power cord.
 - b. Place a jumper between pins 7 and 8 on J96 on the system board behind the battery.



Password Reset Jumper

- c. Plug in the AC power cord and wait for the BMC heartbeat LED on the system board to start blinking green. This should take about 5 seconds from the time you plug in the power cord.
- d. Unplug the AC power cord again and remove the jumper.
- e. Plug in the power cord and boot the system.
- f. The passwords have been cleared. Follow the instructions above to set new system passwords.
- g. Store the system in a secure location and keep the system case locked at all times to protect against unauthorized access.

Management Processor (MP)

The Management Processor (MP) card contains a *processor and I/O hardware* that act as an autonomous embedded device for controlling the system console, reset and power management functions.

NOTE: This section assumes that the MP card is installed in your system. To determine if the card is installed, look at the back panel of your system. You will see a 25-pin serial port if the MP card is installed.

Two major functions of the MP card are *remote and local* manageability. The MP card contains the management processor (MP), which monitors system status and can control various aspects of the system operation, such as power, resets, software/firmware upgrades and cooling. The MP card manageability hardware operates on standby power, independently of the on-off state of the rest of the system.

The MP uses the following external memory: 8 MB DRAM, 8 MB Flash and 512 KB of NVRAM. A power monitor and watchdog timer reset the processor if standby power is out of specification or the processor is inactive for a set amount of time. The processor also uses a 25 MHz clock.

The I/O and memory controller chip is connected to the MP card's I/O bus interface by rope number seven of the system bus. The MP card consists of the following components:

- I/O bus interface
- VGA controller with 16 MB of DDR SDRAM for a video buffer
- Management Processor with:
 - Three RS-232 serial ports
 - Four I²C ports
 - 10/100 BT LAN
 - 16-bit GPIO interface
- Management Processor DRAM, flash memory and battery backed NVSRAM
- I²C battery backed real time clock
- I²C field replaceable unit EEPROM
- I²C 8K serial EEPROM
- System reset logic

MP Card I/O Functionality

The MP card includes these I/O components:

- System serial ports:
 - Three RS-232 ports can be accessed through one three-connector cable (A6144-63001, dongle) when this cable is connected to the DB25 connector located on the backplane of the system. This cable provides for three DB9 connectors for console, modem and UPS.
 - The MP card serial ports can be configured to redirect system console and session communications to the RS-232 lines (local port) and a modem (remote port).
- VGA controller. The 2D VGA graphics controller console port is provided on a DB15F connector. Also, Serial Flash memory with VGA BIOS and a 16 MB video buffer (DDR SDRAM) is included with the VGA controller.
- PCI interface. The PCI interface connects the PCI bus with the MP. This interface emulates three 16550-style UARTs and part of the MP card.
- I²C bus. The I²C bus of the MP provides communication with the BMC.
- Service LAN. Network access is provided by a 10/100 BT LAN connection on a RJ-45 connector and its associated LEDs, which are located on the MP card. An I²C 8K serial EEPROM supports MAC address storage.

NOTE: The MP card can be installed on systems with or without an AGP graphics card. If an AGP graphics card *is not* installed, the MP card VGA port serves as the EFI console and the OS monitor. If an AGP graphics card *is* installed, the AGP graphics card serves as the EFI console and the OS monitor.

Accessing the MP

You can access the MP card and enter MP commands by:

- Serial console port
- LAN connection
- Modem connected to RS232 port

NOTE: The MP screens and commands vary depending on the MP firmware version installed on your system. The MP firmware revision number is listed on the MP login screen. **Make note of the version number before proceeding.**

HP Management Processor
Firmware Revision **E.02.10** Oct 1 2002,10:28:32
(c) Copyright Hewlett-Packard Company 1999-2002. All Rights Reserved.

For information on updating your firmware, see "Firmware upgrades," page 3-50.

Accessing the MP Using the Serial Console Port

To enter MP command mode using the Serial Console Port:

1. Connect the system to a remote device:
 - a. Connect the 25-pin end of a serial cable to the *MP card 25-pin Serial Port*, on the rear panel of the system.
 - b. Connect the console connector on the serial cable to your remote device.
2. Configure the terminal emulation software with these settings:
 - Terminal emulation: VT100+
 - Baud rate: 9600

NOTE: The EFI **baud** command does not change the MP card serial port speed.

- Bits: 8
 - Parity: None
 - Stop Bits: 1 (one)
 - Flow Control: None
3. Using the terminal emulation software, connect to the system with a *direct connection*.
 4. Plug in the system. Do not turn it on. Wait for the MP login to display on the terminal screen.

Accessing the MP Using the MP LAN Port

If you have not already configured your MP LAN port, do so now:

1. Using a telnet client, log on to the system with the hostname provided by your network administrator.

NOTE: All IP addresses and hostnames should be provided by your network administrator.

For example:

```
C:\> telnet MP_Hostname
```

2. Wait for the MP login to display on the telnet screen.

Configuring the MP LAN Port

Before you can execute MP commands via LAN connection, you must configure the LAN settings on the MP card using a Serial Console Port connection:

1. Enter MP command mode using a Serial Console Port (page 3-29).

Execute the LAN configuration (**LC**) command. The LAN Configuration screen for your system's MP firmware revision displays.

- ❑ *MP firmware E.02.10* — the screen includes a summary of your current LAN settings and a prompt:

```
LC
This command allows you to modify the LAN configuration.
Current configuration:
IP Address           : 127.0.0.0
MP Host Name        : myhost
Subnet Mask          : 200.0.0.0
Gateway              : 127.0.1.0
Web Console Port Number : 2023
```

```
Do you want to modify the LAN configuration? (Y/[N])
```

- ❑ *MP firmware E.02.20 or higher* — the screen contains a menu including your current LAN configuration settings:

```
LC
At each prompt you may type DEFAULT to set default configuration
or Q to Quit
Current LAN Configuration:
-- MAC Address       : 0x00306e1ee0dd
I - IP Address       : 127.0.0.0
H - MP Host Name     : uninitialized
M - Subnet Mask      : 255.255.255.0
G - Gateway Address  :
L - Link State       : Auto Negotiate
W - Web Console Port Number : 2023
Enter Parameter(s) to change, A to modify All, or [Q] to Quit:
```

2. Follow the prompts on the screen to modify the LAN settings:

- IP Address
- MP Host name
- Subnet, Gateway
- Web Console Port Number
- LAN hardware configuration (optional)

The *Link State* controls the speed at which the MP card communicates with the network.

- ◆ Select *auto-negotiate* to allow the system to make the fastest possible connection. The MP card will also negotiate to half or full duplex. This is the default, recommended in most cases.
- ◆ Select *10BaseT* to force the MP card to operate at the slower 10BaseT speed if necessary for your network configuration. For example, if your network contains both 10BaseT and 100BaseT connections, and you want the system to communicate with the other 10BaseT connections, you must force it to operate at the slower speed.

NOTE: If you force the MP card to operate at 10BaseT speed, it also operates at half duplex. Make sure that your switch or hub is also in half duplex mode.

In all options, to:

- Change the setting, type the appropriate information, then press **Enter**.
 - Confirm your selections, type **Y** then press **Enter** at the confirmation prompt.
3. Execute the **xd** command to reset the MP card. The following is displayed, depending on your system's MP firmware revision.

- MP firmware E.02.10:*

```
xd
Non destructive tests:
1. Parameters checksum
2. I2C access (get Power Monitor status)
3. LAN access (PING)
4. Modem selftests
5. Secondary I2C access (get System status)
Type R to reset the MP or [Q] to quit the diagnostic menu.
```

-> Choice:

- MP firmware E.02.20 or higher:*

```
XD
Diagnostics Menu:
Non destructive tests:
P - Parameter checksum
I - I2C access (get Power Monitor Status)
L - LAN access (PING)
M - Modem selftests
Destructive tests:
R - Restart the MP
Enter menu item or [Q] to Quit:
```

4. Select option **3** or **L** to ping the LAN and verify the LAN settings are correctly configured.

5. Type **R** and press **Enter** to reset the MP card. (If prompted, type **Y** and press **Enter** to confirm the reset.)

Wait for the status message to clear:

The MP is now being reset...

6. Close your terminal emulation program. You can now telnet to this system from another remote system.

Accessing the MP Using a Modem

NOTE: To enable or disable the modem port, or give switch modem control between the MP and the OS:

- *MP firmware E.02.10* — use the **ER** command
 - *MP firmware E.02.20 or higher* — use the **SA** command
-

To enter MP command mode using a modem:

1. Log into the MP using a serial or LAN connection and configure the modem using the **CA** command (page 3-40):
 - Baud rates: Input and output data rates are the same.
 - Flow control: Hardware uses RTS/CTS; Software uses Xon/Xoff.
 - Terminal type: HPterm
 - Transmit configuration strings: Disable this setting whenever the modem being used is not compatible with the supported modem.
 - Modem presence: When the modem may not always be connected, set this parameter to "not always connected." For example: A modem attached through a switch. In this mode, no dial-out functions are allowed and paging is not possible.
 - Modem protocol: CCITT is a European standard; RTS/CTS signaling is used, as well as the Ring signal. Bell is a U.S. or simple mode.
2. Configure the modem and dial-up software on your remote computer to match the settings on the rx2600 and zx6000 MP card.
3. Dial-in using the procedures required by your dial-up software.
4. Wait for the MP login to display on the screen.

Logging In to the MP Card Interface

1. Access the MP login screen and **take note of the firmware version number listed**:

- MP firmware E.02.10* — press **Ctrl-B** to access the MP login screen.

```
HP Management Processor
Firmware Revision E.02.10 Oct 1 2002,10:28:32
(c) Copyright Hewlett-Packard Company 1999-2002. All Rights Reserved.
```

```
Type Ctrl-B to activate the MP Command Interface
```

- MP firmware E.02.20 or higher* — the MP card boots directly to the MP command mode login screen.

```
HP Management Processor
Firmware Revision E.02.20 May 12 2003,12:26:25
(c) Copyright Hewlett-Packard Company 1999-2003. All Rights Reserved.
MP login:
```

NOTE: To switch between the MP card and EFI console with MP firmware E.02.20 or higher:

- If you are at the EFI console, press **Ctrl-B** to access the MP login screen.
 - If you are at the MP command prompt, execute the **CO** command to enter EFI console mode.
-

2. Log in. The login options depend on your MP firmware revision:

- MP firmware E.02.10* — there are no default MP users. If you have not yet created MP users, press **Enter** at the login and password prompts for initial access.
- MP firmware E.02.20 or higher* —two default users exist:
 - ◆ Administrator: login **Admin**, password **Admin**
 - ◆ Operator: login **Oper**, password **Oper**

3. If you have not yet created MP users, enter a default ID and password at the login and password prompts and press **Enter** for initial access.

```
HP Management Processor
Firmware Revision E.02.11 Feb 14 2003,9:38:32
(c) Copyright Hewlett-Packard Company 1999-2001. All Rights Reserved

MP login:
MP password:
```

NOTE: To ensure system security, the system administrator should do one of the following:

- Disable all remote access to the MP including telnet, web, and remote modem access using the **sa** command (page 3-40), or use the **UC** command to configure MP users:
 - MP firmware E.02.10* — Add a user with a unique password on systems
 - MP firmware E.02.20 or higher* — Add a user with a unique password on systems and delete the default users
-

4. The command prompt or menu displays, depending on your MP firmware revision:

- ❑ *MP firmware E.02.10* — the MP command mode prompt displays:

```

HP Management Processor
Firmware Revision E.02.10 Oct 1 2002,10:28:32
(c) Copyright Hewlett-Packard Company 1999-2002.
All Rights Reserved.

System Name: fstl3a
*****
MP ACCESS IS NOT SECURE

MP users are currently configured and remote access is enabled.
Set up a user with a password (see SO command)
OR
Disable all types of remote access (see EL and ER commands)
*****

MP Host Name: fstl3a
MP>
    
```

- ❑ *MP firmware E.02.20 or higher*, the main menu displays:

```

Hewlett-Packard Management Processor
(c) Copyright Hewlett-Packard Company 1999-2002.
All Rights Reserved.

MP Host Name: iaslhpf
Revision E.02.11

*****
MP ACCESS IS NOT SECURE
Default MP users are currently configured and
remote access is enabled.
Modify default users passwords or delete
default users (see UC command)
OR
Disable all types of remote access (see SA command)
*****

MP MAIN MENU:
CO: Consoles
VFP: Virtual Front Panel
CM: Command Menu
CL: Console Logs
SL: Show Event Logs
CSP: Connect to Service Processor
SE: Create Local Session
HE: Main Help Menu
X: Exit Connection
MP Host Name: iaslhpf
MP>
    
```

5. You can now enter individual commands.

- ❑ To run an individual command on systems with *MP firmware E.02.10*:
 - a. Type the command at the MP command prompt.
 - b. Press **Enter** to execute the command.
- ❑ To run an individual command on systems with *MP firmware E.02.20 or higher*:
 - a. Execute the MP **CM** command, to access the command menu prompt.
 - b. Type the command at the prompt.
 - c. Press **Enter** to execute the command.

Using the MP Commands

The following sections provide a brief overview of the available commands. For detailed information, execute the MP Help command (**he**).

The MP Help menu displays:

```
==== MP Help =====
                               MP Help System

Enter a command at the help prompt:
OVerview  : Launch the help overview
LIst      : Show the list of MP commands
<COMMAND> : Enter the command name for help on individual
            command
TOPics    : Show all MP Help topics and commands
HElp      : Display this screen
Q         : Quit help

====
MP HELP: <selection>
```

Enter a command name for syntax and options for that command.

Executing Commands from Menus

To execute commands from the MP menus:

1. Type the letter designating the command on the menu, then press **Enter**.
2. Follow the prompts on the screen to complete the command.

For example, here is the menu for the LAN Configuration (**lc**) command:

```
LC
At each prompt you may type DEFAULT to set default configuration or
Q to Quit
Current LAN Configuration:
-- MAC Address           : 0x00306e1ee0dd
I - IP Address           : 127.0.0.0
H - MP Host Name         : uninitialized
M - Subnet Mask          : 255.255.255.0
G - Gateway Address      :
L - Link State           : Auto Negotiate
W - Web Console Port Number : 2023
```

Enter Parameter(s) to change, A to modify All, or [Q] to Quit:

Executing Commands from the Command Line

To execute a command from the command line:

1. Enter the command and any parameters at the prompt. For example:

```
MP> MPcommand -parameter1 value1 -parameter2 value2 ... [-nc]
```

2. Press **Enter** to execute the command.

Command Syntax

The MP command syntax is UNIX style; that is, each parameter starts with **-**. For example:

- **-nc** (no confirmation) is optional. If **-nc** is included at the end of the command line, the command is executed without asking for confirmation. If **-nc** is not included, a confirmation prompt is displayed.
- **-?** (MP command-specific help) is optional. If you type **-?** by itself with the command, help on the command displays. If you use the command incorrectly, the help displays in addition to an error message.

To set the default value of a parameter, a predefined value is used. This is the word **DEFAULT**.

- To set all parameters to their default value, a special parameter **-all** is used. For example:

```
MPcommand -all DEFAULT
```

- For multi-level commands with sub-menus, you can set a specific level to the default values. You must already be familiar with the operation of the commands and know the level you wish to skip to. For example:

```
MPcommand -level DEFAULT
```

where *-level* is the number of the level you wish to reset.

To determine if a given command is multilevel either:

- execute it from a command-menu interface, or
- review the command line help for that command

One example of a multilevel command is the **CA** serial-port configuration command:

```
MP:CM> ca
```

This command allows you to modify the local and remote modem serial port configurations. Note that terminal type is set simultaneously for all ports. At each prompt you may type **DEFAULT** to set default configuration or **Q** to Quit

```
Local and Remote Serial Port Configuration Menu:
D - Display Local/Remote Serial Port Configuration
L - Modify Local Serial Port Configuration
R - Modify Remote/Modem Serial Port Configuration
T - Modify Terminal type
Enter menu item or [Q] to Quit: q
```

```
MP Host Name: gsthpd6
```

```
MP:CM> ca -r default
```

```
New Remote/Modem Serial Port Configuration (* modified values):
```

```
* Bit Rate in bits/sec      : 19200
* Flow Control              : Software
* Modem Presence           : Always connected
* Modem Protocol            : CCITT
* Transmit Configuration Strings : Enabled
```

```
Confirm? (Y/[N]):
```

In this command (**CA**), to set:

- ◆ all parameters to the default settings, execute: `CA -all default`
 - ◆ a specific "level," such as remote or local port configuration to the default, execute `CA -remote default` or `CA -local default`
- You also can set some parameters to defaults, and others to specified values. For example:

```
MPcommand -parameter1 value -parameter2 DEFAULT
```

Command Descriptions

Main Menu Commands

Main Menu commands are executed from:

- the MP command prompt with *MP firmware E.02.10*
- the Main Menu prompt of the MP interface with *MP firmware E.02.20 or higher*

Command	Description
CO	Consoles
VFP	Virtual Front Panel
CM	Command Menu
CL	Console Logs
CSP	Connect to Service Processor (local/remote ports only)
SE	OS Session (local/remote ports only)
SL	Show Event Logs
HE	MP Help Menu
X	Exit MP Interface

Command Categories

There are six categories of MP commands:

- **ST** — Status commands
- **SC** — Server control commands
- **C** — General MP configuration commands
- **P** — MP port configuration commands
- **Cx** — Connections commands

The commands in these categories are described in the following sections.

Status Commands

Status commands provide status on the system and on the MP card.

Command	Description
DATE	Display date
DF	Display field replaceable unit information
LS	LAN status
MS	Status of the modem
PS	Power management module status
SR or SYSREV	Display all firmware revisions
SS	System's processor status

Server Control Commands

These commands alter the state of the server.

Command	Description
BP	Reset BMP passwords
LOC	Locator LED status
MR	Modem reset
PC	Remote power control
PR	Power restore policy configuration
RB	Reset BMC
RS	System reset from RST signal
TC	Transfer of control; system reset through INIT signal

General MP Configuration Commands

These commands allow you to perform general configuration tasks, such as configuring automatic system restart and setting the default configuration.

Command	Description
CG	Generate RSA key pair of self-signed certificate
DC	Default configuration
FW	Upgrade the MP firmware
ID	System identification
IT	Inactivity timeout settings
SO	Configure security options
UC	User configuration
XD	Diagnostics or reset of MP

MP Port Configuration Commands

Port configuration commands allow you to configure LAN/WEB, remote/modem, and local ports.

NOTE: If you are not connecting anything to a port, hardware flow control should be off.

Command	Description
<i>Serial Port Configuration</i>	
CA	Configure serial ports
SA	Enable/disable remote and modem access
PG	Paging parameter setup
<i>LAN Configuration</i>	
SA	Enable/disable LAN and web access
LC	LAN configuration menu

Connections Commands

Connections commands provide a means for examining and making connections or changing modes.

Command	Description
DI	Disconnect remote or LAN connection
TE	Send message to other user
WHO	Display a list of connected users ⁴³

Baseboard Management Controller (BMC)

This section explains the BMC command-line interface. Topics include:

- “Accessing the BMC,” page 3-42
- “Using the BMC Command Line Interface (CLI),” page 3-43
- “Simple Commands,” page 3-44
- “IPMI Commands,” page 3-45

Accessing the BMC

To log in to the BMC command line interface, use a serial connection and terminal emulation software:

NOTE: The default terminal emulation type is VT100+. Terminal emulation for the BMC cannot be changed. The default baud rate is 9600. This setting can be changed from the EFI Boot Options Maintenance Menu.

1. With the system turned off, connect a null-modem cable to *Serial Port 1* on the rear panel of the system, and to your remote device.
2. Configure the terminal emulation software with these settings:
 - Baud rate: 9600
 - Bits: 8
 - Parity: None
 - Stop Bits: 1 (one)
 - Flow Control: XON/XOFF
3. Using the terminal emulation, connect to the system with a *direct connection*.
4. Turn on the system. The EFI menu displays in the terminal window.
5. To access the BMC command line interface, press: **Esc (**

For example, on a U.S. QWERTY keyboard, press **Esc**, then press **Shift** and **9** at the same time.

NOTE: If AC power is connected to the system, this command activates the BMC command line interface even if the system power is off.

6. If prompted, enter the user or admin password at the login prompt:

```
login>
```

(You are not prompted for a password if none has been defined.)

7. The BMC prompt displays. If you entered the admin password, you have full access. If you entered the user password, you have restricted access.

```
Admin Session Initiated  
cli>
```

or

```
User Session Initiated  
cli>
```

Using the BMC Command Line Interface (CLI)

The Baseboard Management Controller supports the industry-standard Intelligent Platform Management Interface specification (IPMI 1.0 with Extensions). This specification describes the management features that have been built into the system board. These features include:

- diagnostics (local and remote)
- console support
- configuration management
- hardware management
- troubleshooting

There are two categories of BMC commands:

- Simple commands
- Intelligent Platform Management Interface (IPMI) commands

This section provides a brief overview of the available commands. For detailed information, see the Intel web site:

<http://www.intel.com/design/servers/ipmi>

Executing BMC Commands

To execute BMC commands at the command prompt:

1. Type the command and any required parameters after the `cli>` prompt.
Use the **Backspace** key to correct mistakes.
2. Press **Enter** to execute the command.

Logging Out of the BMC Command Line Interface

When you are finished using the BMC CLI:

1. If you have a system password set, to log out of the BMC without returning to the system console, execute:

Q

The BMC login prompt displays:

```
login>
```

2. To log out of the BMC and return to the system console, press **Esc Q** (press **Esc**, then press **Shift** and **Q** at the same time).

Simple Commands

Simple IPMI commands allow you to control the BMC interface, view logs, get help, and change your password.

To execute simple BMC commands:

1. Type the command followed by any required options. (The table below describes the simple commands.)
2. Press **Enter**.
3. If prompted for additional information, enter it, then press **Enter**. For example:

```
cli> c
Type the new password> ****
Retype the new password> ****
New password confirmed.
cli>
```

Command Syntax	Options	Mode	Description
C	Prompts user for new password	User	Allows user to change the password.
FPL	N/A	User	Reads the forward progress log. This log is encoded and can be used by HP support representatives. For additional information see "SEL and FPL Log Entries" on page D-4.
H	N/A	User	Displays list of BMC commands.
INFO	N/A	User	Displays the BMC firmware revision.
LOC [0, 1]	0=off 1=on	User	Turns the system locator LED on or off.
P [0, 1]	0=off 1=on	User	Forces system power on or off; does not shut down using OS procedures. If you do not enter a parameter, displays the current power state.
Q	N/A	User	Logs out user; does not close BMC session.
RS	N/A	User	Resets the system.
SD	N/A	User	Displays the SDR repository. This data is encoded according to the IPMI spec and can be used by HP support representatives.
SE	N/A	User	Displays system event log (SEL). This log is encoded and can be used by HP support representatives. For additional information see "SEL and FPL Log Entries" on page D-4.

IPMI Commands

IPMI commands allow you to communicate with and configure various components of the system. IPMI commands are available only to users with Admin level access.



CAUTION: DO NOT run BMC IPMI commands unless you are experienced with the IPMI specification. If you make mistakes running these commands, you can accidentally delete or modify data and cause your system to operate unpredictably or fail to operate.

All IPMI commands require a sequence of hex codes used as parameters. Each command may include some or all of the following parameters:

- *Network Function and Lun (NetFnLun)*. The NetFn parameter identifies the message category. The LUN value is always 0.
- *Command*. The messages specified in this document contain a one-byte command field. Commands within each category are unique. Command values can range from 00h through FDh. FEh is reserved for future extension of the specification, and FFh is reserved for message interface level error reporting on potential future interfaces.
- *Data*. The Data field carries the additional parameters for a request or a response, if any.

The IPMI commands can be entered in long or short forms. The associated response from the BMC matches the form of the command.

For example:

- Short format, or `ipmi`, command:

- Syntax:

```
ipmi NetFnLun Cmd Data1 Data2 ... DataN
```

- Sample command and system response:

```
cli> ipmi 18 04
00 55 00
cli>
```

- Long format, or `i`, command:

- Syntax:

```
i 0 NetFnLun 0 0 0 Cmd Data1 Data2 ... DataN 0
```

- Sample command and system response:

```
cli> i 20 18 C8 f0 04 04 08
F0 1C F4 20 04 04 00 55 00 83
cli>
```

Long format IPMI commands (“I”) use an ASCII transcription of the IPMI data format. The following examples illustrate how IPMI commands and responses are structured.

NOTE: All non-command bytes can be replaced with 0.

Long Format IPMI Command Data Structure Example

Bits		Byte
7-2	1-0	
rsSa = 0x20		0x20
NetFn = 0x07	rsLUN = 0x00	0x18
Checksum = 0xC8		0xC8
rqSWID = 0xF0		0xF0
rqSeq = 0x01	rqLUN = 0x00	0x04
Cmd = 0x04		0x04
Checksum = 0x08		0x08

Long Format IPMI Response Data Structure Example

Bits		Byte
7-2	1-0	
rqSWID = 0xF0		0xF0
NetFn = 0x07	rsLUN = 0x00	0x1C
Checksum = 0xF4		0xF4
rsSA = 0x20		0x20
rqSeq = 0x01	rsLUN = 0x00	0x04
Cmd = 0x04		0x04
Data byte 1 = 0x00 (completion code)		0x00
Data byte 2 = 0x55 (result = no error)		0x55
Data byte 3 = 0x00 (details)		0x00
Checksum = 0x83		0x83

The BMC supports the version 1.0 IPMI categories and commands listed in the following tables. For detailed information on the IPMI specification and commands, see the Intel web site:

<http://www.intel.com/design/servers/ipmi>

Command Categories

NetFn	NetFn << 2	Description
00, 01	00, 04	Chassis
04, 05	10, 14	Sensor/Event (S/E)
06, 07	18, 1C	Application
0A, 0B	28, 2C	Storage
32, 33	C8, CC	HP Custom (proprietary)

Chassis Commands

Command	Description
01h	Get chassis status
02h	Chassis control
0Fh	Get power-on hours (POH) counter
06h	Set power restore policy

Sensor/Event Commands

Command	Description
01h	Get event receiver
02h	Platform event (a.k.a. "Event Message")
28h	Set sensor event enable
29h	Get sensor event enable
2Ah	Re-arm sensor events
2Dh	Get sensor reading

Application Commands

Command	Description
<i>IPM Device "Global" Commands</i>	
01h	Get device ID
02h	Cold reset
03h	Warm reset
04h	Get self test results
<i>Broadcast Commands</i>	
01h	Broadcast 'Get Device ID'
<i>System Interface Commands</i>	
2Eh	Set BMC global enables
2Fh	Get BMC global enables
30h	Clear message flags
31h	Get message flags
32h	Enable message channel receive
33h	Get message
34h	Send message
35h	Read event message buffer
36h	Get BT interface capabilities

Command	Description
<i>BMC Watchdog Timer Commands</i>	
22h	Reset watchdog timer
24h	Set watchdog timer
25h	Get watchdog timer

Storage Commands

Command	Description
<i>SEL Commands</i>	
40h	Get SEL info
41h	Get SEL allocation info
42h	Reserve SEL
43h	Get SEL entry
44h	Add SEL entry
47h	Clear SEL
48h	Get SEL time
49h	Set SEL time
<i>SDR Repository Commands</i>	
20h	Get SDR repository info
21h	Get SDR repository allocation info
22h	Reserve SDR repository
23h	Get SDR
28h	Get SDR repository time
29h	Set SDR repository time
<i>FRU Inventory Device Commands</i>	
10h	Get FRU inventory area info
11h	Read FRU inventory data
12h	Write FRU inventory data

Firmware upgrades

To update the system and BMC firmware or the MP card firmware:

1. Download the firmware update from <http://www.hp.com/go/bizsupport>.

Follow the menu prompts to navigate to the support page:

- ◆ Select **download drivers/software**.
- ◆ Enter the product name in the search field (**Integrity rx2600 server** or **zx6000 workstation**).
- ◆ Select the search result.
- ◆ Choose the firmware release you need to download (system and BMC or MP card).
- ◆ Click the **i** information icon for instructions on how to download, unpack, and install the firmware upgrade:



2. Download, unpack and install the firmware upgrade.
3. Execute the **info fw** EFI command to confirm that the upgrade was successful.

Troubleshooting

This chapter contains the following sections, which describe how to identify and solve common problems you may encounter when using your HP Integrity rx2600 server and HP workstation zx6000:

- “Identifying and Diagnosing Hardware Problems” on page 4-1
- “Running Diagnostic Software Tools” on page 4-18

Identifying and Diagnosing Hardware Problems

Should a hardware failure occur, the system LEDs and e-buzzer will help you identify the problem:

- **System beeps and e-buzzer.** The rx2600/zx6000 has an e-buzzer that beeps in specific patterns to identify errors when the system boots. The e-buzzer can also send encoded data over the phone to help support representatives identify more complex problems.
- **LEDs.** The lights on the front bezel of the system change color and blink in different patterns to help identify specific hardware problems. LEDs on the rear panel of the system display LAN status.
- The **System Event Log (SEL)** provides detailed information about the errors identified by the e-buzzer and LEDs. See page 4-5 and page D-4.

If the LEDs and e-buzzer do not give you enough information for you to identify the problem you are experiencing, HP also provides diagnostic tools with each operating system.

The System e-buzzer

If a problem is detected at any time when the system is booting or running, the e-buzzer emits audible beeps and an encoded error message.

- The audible beeps consist of a modem-like sound repeated 3 times, followed by 0-7 beeps of a single frequency at 1-second durations, each separated by 1 second. The e-buzzer emits a different number of beeps for each type of error. More detailed information is provided by the LEDs.
- The electronic signal can be sent through a telephone line to an authorized help desk or HP Support. This signal can be decoded by help desk equipment to extract the system model, serial number and details about any faults. To send this signal to HP Support, hold your telephone next to the LED 1 on the system front bezel when the system is booting.
- The e-buzzer does **not** report all problems, only the problems listed below. If the e-buzzer indicates an error, check the SEL (see page 4-5 and page D-4) for a more detailed explanations of the failure.

Number of Beeps	Component	Description
1	Processor	Processor absent or not correctly connected. Reseat or replace processor.
2	Power supply	Power supply failure. Replace power supply.
3	Memory	No memory, bad memory modules or incompatible memory module. Check memory module loading order. Reseat or replace memory modules.
4	Graphics card	Graphics card problem. Reseat or replace the graphics card.
5	PCI card	PCI card problem. Reseat or replace the PCI card.
6	Critical system failure	<p>Contact support.</p> <ul style="list-style-type: none"> • System Fault caused by hardware failure or software fault. • Two minutes has elapsed after the BMC starts system power and no BOOT_START event is logged in the SEL. Possible problems include: <ul style="list-style-type: none"> • Clock is bad • System board problem • CPU connection to the board bad • CPU power pod failure • CPU failure • Corrupt Firmware (bad code, or improper update)
7	System board	Defective system board. Contact support.

NOTE: For detailed instructions on removing and replacing system components, see Chapter 2, “Installing or Replacing Parts and Accessories.”

The e-Buzzer may also be activated by several other events:

- If the system firmware detects an error during system operation, the BMC will trigger the e-Buzzer to sound.
- If you miss the beep code count during the initial transmission sequence, trigger the sequence again by pressing and holding the system power button for 3-5 seconds and *release it as soon as the sound begins*.

The power button on the front panel operates differently depending on how long the button is pressed and whether or not the system was on or off when the button was pressed.

- When the system power is off:
 - 1-3 seconds. System power turns on. The e-buzzer will beep if an error is encountered.
 - 3-5 seconds. The e-buzzer will repeat the last stored error.
- When the system power is on and the system is at the EFI:
 - 1-3 seconds. System power turns off immediately.
 - 3-5 seconds. The e-buzzer will repeat the last stored error.
 - 5 seconds or longer. System power turns off immediately.
- When the system power is on and the OS is running:
 - 1-3 seconds. System power turns off via ACPI signal to OS (Soft power-down).
 - 3-5 seconds. The e-buzzer will repeat the last stored error.
 - 5 seconds or longer. System power turns off immediately (Hard power-down).

The Diagnostic LEDs

Diagnostic LEDs are on the front panel of the system. The following sections describe their functions. (For the function of other LEDs, see the *HP Integrity rx2600 server and HP workstation zx6000 Getting Started Guide*.) Additional diagnostic LEDs are on the system board.

If the system has **no** MP card installed, the four diagnostic LEDs on the front panel warn of impending failures and allow you to take preventive action. For example, you may want to back up your data or replace a component before it fails.

- If **no** MP card is installed, the boot progress is monitored by Diagnostic LEDs 1-4. During the boot-up the LEDs will turn on in sequence until the EFI prompt is reached.
- If an MP card is installed, the boot process will be monitored by the MP card. The LEDs will be off.

Power and System LEDs

The **Power and System LEDs** indicate the state of the system. When the System LED is blinking orange or red, a problem exists.

systems with MP card

The following system LED states exist for systems with an MP card. See the SL logs for additional information.

System LED	State
Off	Off
Solid green	Running OS
Blinking green	Booting or running EFI
Blinking orange (1/sec.)	Attention: <ul style="list-style-type: none"> • Alerts of levels 3-5 detected in the MP logs. • The LED will turn off once the event log has been read.
Blinking red (2/sec.)	Fault: <ul style="list-style-type: none"> • System Alert 7 Detected. LED blinks until the problem is resolved and the system boots successfully or until it is manually turned off with the MP dc command. • Fatal hardware error detected by BMC. LED blinks until problem is corrected.

For system alerts of levels 3-5, the attention condition on the LED can be cleared by accessing the logs using the **sl** or **dc** command available in the MP command mode.

System alerts of level 7 indicate that the system cannot complete the power-on self test (POST). Refer to the SL error logs for additional error information. Once corrective action has been completed, the fault LED will turn off.

NOTE: Always check the MP Status Logs in the case of a blinking orange or red System LED before replacing any hardware.

System Logs (SL) Logs

To view the SL logs for detailed diagnostic information, use the **sl** MP command:

1. Access the MP command prompt (page 3-29).
2. Run the **sl** command. The Event Log Viewer menu displays:

```
SL
Event Log Viewer:

Log Name                Entries    % Full    Latest Entry
-----
E - System Event        9          1 %       29 Oct 2002 19:15:05
F - Forward Progress    129        3 %
B - Current Boot        82
P - Previous Boot       0
L - Live Events
C - Clear All Logs
```

Enter your choice or [Q] to Quit:

3. Select **e** to review the events. The Event Log Navigation menu displays:

Set up alert filter options on this buffer? (Y/[N])

```
Log Name                Entries    % Full    Latest Entry
-----
E - System Event        410        47 %       18 Feb 2003 09:38:10
```

Event Log Navigation Help:

```
+      View next block      (forward in time, e.g. from 3 to 4)
-      View previous block (backward in time, e.g. from 3 to 2)
<CR>  Continue to the next or previous block
D      Dump the entire log for capture and analysis
F      First entry
L      Last entry
J      Jump to entry number
V      View mode configuration (text, keyword, hex)
?      Display this Help menu
```

Ctrl-B Quit and return to the Main Menu

4. Select **v**, then **t** to change the display to text mode:

```
Display Mode Configuration:
      H - Hex mode
Current -> K - Keyword mode
      T - Text mode
Enter new value, or [Q] to Quit:
```

5. To decode the blinking state of System LED, review the entire SEL and look at events with alert level 3 and above.

For example:

```
Log Entry 24: 14 Feb 2003 15:27:02
Alert Level 3: Warning
Keyword: Type-02 1b0800 1771520
Hot Swap Cage: SCSI cable removed
Logged by: BMC; Sensor: Cable / Interconnect - SCSI ChExt Cable
Data1: Device Removed/Device Absent
0x203E4D0AC6020220 FFFF0008F61B0300

Log Entry 73: 00:00:12
Alert Level 3: Warning
Keyword: Type-02 050301 328449
The server's built-in sensors have detected an open chassis door.
Logged by: BMC; Sensor: Physical Security - Chassis Open
Data1: State Asserted
0x200000000C020570 FFFF010302050300
```

Systems with no MP card

The following system LED states exist for systems **without MP card**. See the Diagnostic LEDs for additional information.

Power LED	System LED	State
Off	Off	Off
On (green)	Solid green	Running
On (green)	Blinking green	Booting
On (green)	Blinking orange (1/sec.)	Attention
On (green)	Blinking red (2/sec.)	Fault

Diagnostic LEDs

The four diagnostic LEDs on the front bezel of the system are used for diagnosing the health of the system. Refer to the SEL and FPL logs for specific information about the warning or failure indicated by the diagnostics LEDs.

These LEDs warn of impending hardware failures and allow you to take preventive action, such as making a system backup or replacing a component before it fails. These diagnostic LEDs are labeled 1, 2, 3 and 4.

The location of red LEDs can be used to identify the category of the fault or warning. For example, if LED one is red, there is a problem with memory. However, if LEDs one and two are both red, there is a problem with the system processor.

If the diagnostic LEDs indicate an error, check the SEL (see page 4-5 and page D-4) for a more detailed explanations of the failure.

The following symbols are used in the LED tables.

- The System LED indicates the severity of the error. Check this LED before proceeding to analyze the sequence of diagnostic LEDs:



Blinking orange indicates a WARNING.



Blinking red indicates a FAULT.

- The Diagnostic LEDs provide details about the specific error:

















Solid red indicates the failing part or sub-system.
























Off or solid green diagnostic LEDs provide additional details about the failure.























The faults and warnings fall into several general categories.

























LED1	LED2	LED3	LED4	Category	e-buzzer Beeps
RED 				Memory	3
	RED 			Firmware	6
		RED 		System Board	7
			RED 	Fan	None
RED 	RED 			Processor	1
RED 		RED 		BMC	7
RED 			RED 	Temperature	None
	RED 		RED 	Power Supply	2
RED 	RED 	RED 	RED 	Unknown	None

Warnings

The following tables provide additional information about each specific warning associated with the various possible LED lighting sequences **when the system LED is orange**.






















System LED	LED1	LED2	LED3	LED4	Problem	Solution
Unknown Warnings						
ORANGE 	RED 	RED 	RED 	RED 	Unknown warning	View the SEL for additional information (page D-4). For further assistance, contact your HP Support Engineer.
Memory Warnings						
ORANGE 	RED 	GREEN 			Mismatched memory pairs	Use the memory sequence diagram on page 2-25.
ORANGE 	RED 		GREEN 	GREEN 	Memory thermal load order	Use the memory sequence diagram on page 2-25.
ORANGE 	RED 	GREEN 	GREEN 	GREEN 	Bad SPD information (can't detect type)	View the SEL for additional information (page D-4). For further assistance, contact your HP Support Engineer.
System Board Warnings						
ORANGE 	GREEN 	GREEN 		RED 	Battery voltage low	Replace the system board battery.

System LED	LED1	LED2	LED3	LED4	Problem	Solution
Fan Warnings						
ORANGE 	GREEN 			RED 	Fan 1A not functioning properly	
ORANGE 		GREEN 		RED 	Fan 1B not functioning properly	
ORANGE 			GREEN 	RED 	CPU fan 0 not functioning properly	Replace the fan that is not functioning. If a processor fan has failed, you must replace the CPU.
ORANGE 	GREEN 	GREEN 		RED 	CPU fan 1 not functioning properly	
ORANGE 		GREEN 	GREEN 	RED 	Fan module 2 (memory) not functioning properly	
ORANGE 	GREEN 	GREEN 	GREEN 	RED 	Fan module 3 (Disks/PCI) not functioning properly	































System LED	LED1	LED2	LED3	LED4	Problem	Solution
Processor Warnings						
ORANGE 	RED 	RED 	GREEN 		Processor 0 temperature exceeds limit	If a processor fan has failed, you must replace the CPU.
ORANGE 	RED 	RED 		GREEN 	Processor 1 temperature exceeds limit	
Temperature Warnings						
ORANGE 	RED 	GREEN 	GREEN 	RED 	External air temperature too high	Make sure nothing is blocking the system's airflow and locate your system in an air-conditioned room.
Video Warnings						
ORANGE 		RED 	RED 		No video adapter present	Install a video adapter. See the installation instructions shipped with the video adapter.
Power Supply Warnings						
ORANGE 	GREEN 	RED 		RED 	Power supply 1 fault	Replace the power supply.
ORANGE 		RED 	GREEN 	RED 	Power supply 2 fault	

Faults

The following tables provide additional information about each specific fault associated with the various possible LED lighting sequences **when the system LED is red**.

System LED	LED1	LED2	LED3	LED4	Problem	Solution
Unknown Faults						
					Unknown fault	View the SEL for additional information (page D-4). For further assistance, contact your HP Support Engineer.
Memory Faults						
					Mismatched memory pairs	Use the memory sequence diagram on page 2-25.
					Uncorrectable memory error	Replace memory.
					No memory installed	Install memory.
					Bad memory; one or more DIMMs are bad or not seated properly	Reseat the DIMMs. If the error persists, replace them.
Firmware Errors						
					System firmware hang or system fault	View the SEL for additional information (page D-4). For further assistance, contact your HP Support Engineer.

System LED	LED1	LED2	LED3	LED4	Problem	Solution
System Board Faults						
					VRM overvoltage	View the SEL for additional information (page D-4). For further assistance, contact your HP Support Engineer.
					VRM undervoltage	View the SEL for additional information (page D-4). For further assistance, contact your HP Support Engineer.
Fan Faults						
					rs2600: Cooling unit 1 fault (power/CPU) zx6000: Cooling unit 1 fault	
					rs2600: Cooling unit 2 fault (memory) zx6000: Cooling unit 2 fault (disks/PCI)	Replace the failed fan. If a processor fan has failed, you must replace the CPU.
					rs2600: Cooling unit 3 fault (Disks/PCI) zx6000: N/A	
Processor Faults						
					Processor 0 temperature exceeds limit	
					Processor 1 temperature exceeds limit	If a processor fan has failed, you must replace the CPU.
					No processor detected	

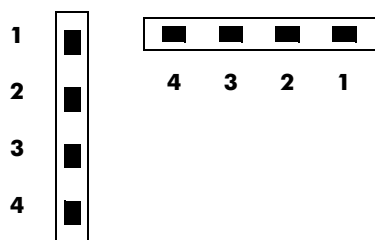
System LED	LED1	LED2	LED3	LED4	Problem	Solution
BMC Faults						
					BMC firmware is damaged	Turn off and unplug the system. Wait 20 seconds, then plug in and restart the system. If the error repeats, replace the system board.
					System board FRU inventory device inaccessible	Replace the system board.
Temperature Faults						
					External air temperature too high	Make sure nothing is blocking the system's airflow and locate your system in an air-conditioned room.
Power Supply Errors						
					VRM or power pod fault	View the SEL for additional information (page D-4). For more help, contact your HP Support Engineer.
					Power Supply 1 fault	
					Power Supply 2 fault	
					12V out of range (power supply interface fault)	

LAN LEDs

The front panel **LAN LED** indicates the system is communicating over the Gigabit or System Management LAN:

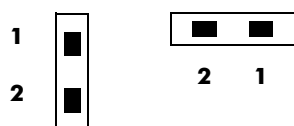
- **blinking green**, the system is communicating over the LAN
- **solid green**, LAN link is established, no current LAN activity
- **not green**, the system is off

Four **Gigabit LAN LEDs** are on the rear panel:



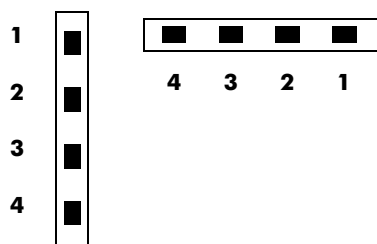
LAN LED	Location	Color	State
1. Gbit	Tower: Right	Off	No 1000 Mbps link
	Rack-mounted: Top	Green	Port linked at 1000 Mbps
2. 100mb	Tower: 2nd from right	Off	No 100 Mbps link
	Rack-mounted: 2nd from top	Green	Port linked at 100 Mbps
3. Link	Tower: 2nd from left	Off	No 10 Mbps link
	Rack-mounted: 2nd from bottom	Green	Port linked at 10 Mbps
4. Activity	Tower: Left	Off	No LAN activity
	Rack-mounted: Bottom	Green	Flashing or solid green LED indicates activity on LAN port

Two **System Management 10/100 LAN LEDs** are on the rear panel:



LAN LED	Location	Color	State
1. Speed	Tower: Right	On	Port linked at 100 Mbps
	Rack-mounted: Top	Off	Port linked at 10 Mbps
2. Activity	Tower: Left	On	Port linked
	Rack-mounted: Bottom	Off	No link established

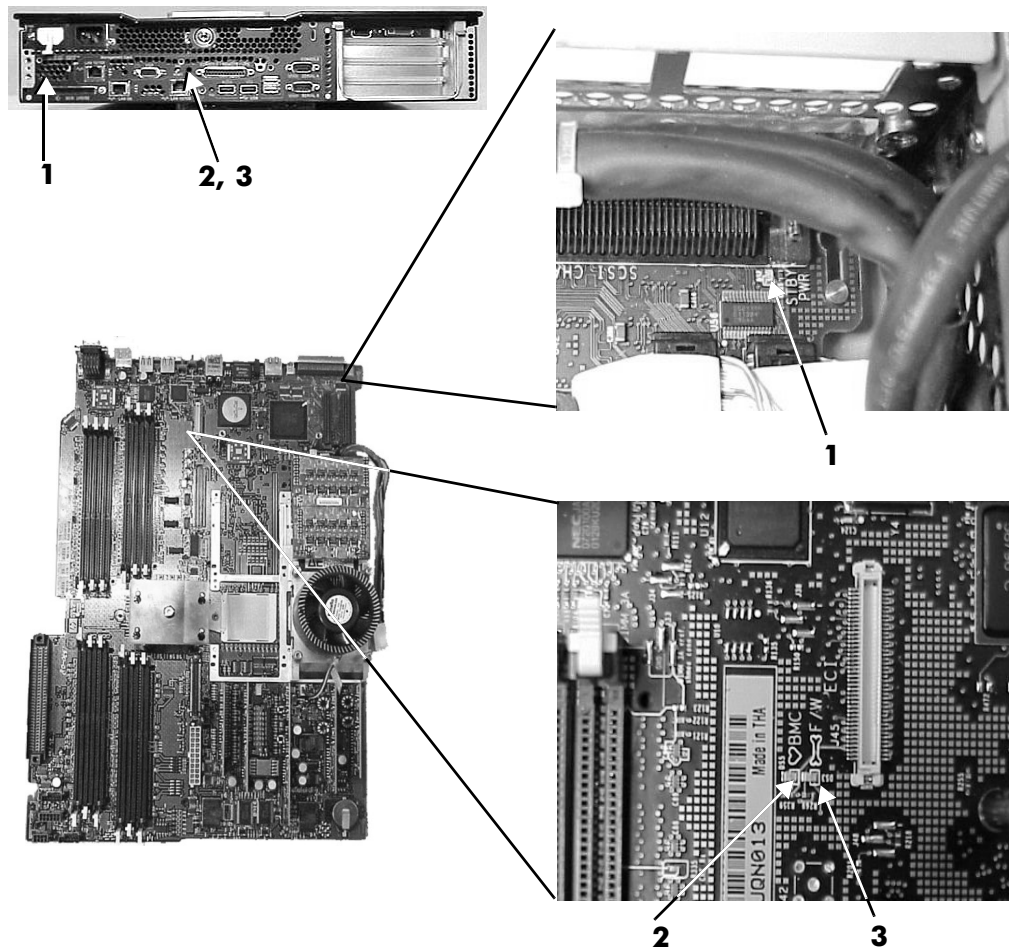
Four **MP LAN LEDs** are also on the rear panel if the system has a MP card installed:



LAN LED	Location	Color	State
1. Self-test	<i>Tower:</i> Right	Yellow	MP running self test or error
	<i>Rack-mounted:</i> Top	Off	MP has booted
2. 10BT	<i>Tower:</i> 2nd from right	Green	10 Mb link established
	<i>Rack-mounted:</i> 2nd from top	Blinking Green	10 Mb activity
		Off	No link or 100 Mb link
3. 100BT	<i>Tower:</i> 2nd from left	Green	100 Mb link established
	<i>Rack-mounted:</i> 2nd from bottom	Blinking Green	100 Mb activity
		Off	No link or 10 Mb link
4. Standby Power	<i>Tower:</i> Left	Green	Standby power on
	<i>Rack-mounted:</i> Bottom	Off	Standby power off

System Board Diagnostic LEDs

There are three additional LEDs that can help when troubleshooting the system. These LEDs are located on the system board close to the back of the system and can be viewed through the small cooling holes in the system case.



Location of the STBY LED, F/W LED and BMC LED

LED	Description
1 STBY	This standby LED comes on as soon as the system power cord is plugged in. If this light is off when you plug it in, reseal the power supply, and if this does not work, replace the power supply. See Chapter 2 for instructions.
2 BMC	A few seconds after the system is plugged in this LED starts blinking, which means that the Baseboard Management Controller is alive. If this LED is not blinking and the STBY (standby) LED is on, you may have to replace the system board.
3 F/W	A few seconds after the power button is pressed in the system firmware code fetch LED comes on indicating that the firmware has started the boot process. If this LED does not come on, you may have to replace the system board.

Running Diagnostic Software Tools

This section includes information on the following diagnostic tools:

- HP e-DiagTools Hardware Diagnostics

Before you run the HP diagnostic software, take note of any e-buzzer and LED error messages. To find out more about the error, note any event messages and use the tool appropriate for your system to determine what failed.

NOTE: Event messages are listed in Appendix D.

HP e-DiagTools Hardware Diagnostics

Your system came with an *HP IPF Offline Diagnostics and Utilities* CD with HP e-DiagTools Hardware Diagnostics. These tools may be used to diagnose hardware-related problems on your HP system.

Run e-DiagTools before contacting HP for Warranty service. This is to obtain information that will be requested by a Support Agent.

With this utility you can:

- Check the hardware configuration and verify that it is functioning correctly.
- Test individual hardware components.
- Diagnose hardware-related problems.
- Obtain a complete hardware configuration.
- Provide precise information to an HP support agent so they can solve problems quickly and effectively.

HP e-DiagTools provides a user-friendly interface to the *Offline Diagnostics Environment (ODE)*, that enables you to troubleshoot a system that is running without an OS or cannot be tested using the online tools. ODE can also be run separately using a command line interface, which allows the user to select specific tests and/or utilities to execute on a specific hardware module.

Starting HP e-DiagTools

1. Insert the *HP IPF Offline Diagnostics and Utilities* CD in the CD or DVD drive, or download and install the files from www.hp.com/go/bizsupport.
2. From the EFI shell (page 3-2), select the CD/DVD drive:
 - a. Use the **map** command to list the drives on your system. For example:

```
Shell> map
Device mapping table
fs0:Acpi (HWP0002,0)/Pci (2|0)/Ata (Primary,Master)/CDROM...
fs1:Acpi (HWP0002,100)/Pci (1|0)/Scsi (Pun0,Lun0)/HD (Part...
blk0:Acpi (HWP0002,0)/Pci (2|0)/Ata (Primary,Master)...
blk1:Acpi (HWP0002,0)/Pci (2|0)/Ata (Primary,Master)/CDROM...
```

NOTE: Lines are truncated to fit.

- b. Change to the CD/DVD drive:

```
Shell> fs0:
fs0:>
```

3. Navigate to the EFI\BOOT directory on the CD:

- a. Change to the EFI directory on the diagnostics CD.

```
fs0:> cd EFI
fs0\EFI:>
```

- b. Execute the **ls** command to list the contents of the directory.

```
fs0:\EFI> ls
Directory of: fs1:\EFI
11/07/02 04:41p <DIR> 1,024 .
11/07/02 04:41p <DIR> 0 ..
11/07/02 04:41p <DIR> 1,024 HP
11/07/02 04:45p <DIR> 1,024 BOOT
0 File(s) 0 bytes
4 Dir(s)
```

- c. Change to the BOOT subdirectory

```
fs0\EFI:> cd BOOT
fs0\EFI\BOOT:>
```

- d. Execute the **ls** command to list the contents of the directory.

```
fs0:\EFI\BOOT> ls
Directory of: fs1:\EFI\BOOT
11/07/02 04:45p <DIR> 1,024 .
11/07/02 04:45p <DIR> 1,024 ..
11/07/02 01:54p 731,136 LaunchMenu.efi
11/07/02 01:54p 2,763 IO.ini
11/07/02 01:54p 731,136 BOOTIA64.EFI
11/07/02 01:54p 2,995 LaunchMenu.ini
11/07/02 01:54p 3,977 View_Doc.ini
5 File(s) 1,472,007 bytes
2 Dir(s)
```


4. Execute the **LaunchMenu** command to reboot from the CD and launch eDiagTools:

```
fs0:\BOOT> launchmenu
```
5. If you are not familiar with e-DiagTools, review the documentation. From the main menu:
 - a. Select **View Release Notes and Documentation Menu** to view a list of available documentation.
 - b. Select **View e-DiagTools Info** to open the overview document.
6. If you are already familiar with e-DiagTools, select **Run e-DiagTools for IPF** from the main menu.

Producing a Support Ticket

To produce a complete record of your system's configuration and test results, you must create a Support Ticket. This is a simple text file that contains essential information and is designed to assist your local or HP Support Agent.

To produce a Support Ticket, from the **Welcome to e-DiagTools** Menu:

1. Start e-DiagTools and select **Run eDiagTools for IPF** from the main menu.
2. Select **2 - Run e-DiagTools Basic System Test (BST)** to run the basic diagnostics on your system if you have not already done so.

e-DiagTools scans your system. The Configuration Description displays on the screen when the configuration detection phase is complete.
3. Select **2 - Continue Test** to run the rest of the basic diagnostics test. The results will display on the screen. For example:

```
*****
e-Diagtools for IPF rev. A.01.39 (c) Hewlett-Packard Company, 2002

Test Results
Tests passed. No errors found.
If you still experience problems with your system, try the
following:
1. Power off and restart your system.
2. Update the system's firmware.
3. Back up your data and contact your HP Support Agent for more
   advice.

1-Help 2-Advanced 3-Exit 4-Support Ticket
```

4. After the test is complete, press **4**. The Support Ticket will display on the screen. For example:

```
-----  
HEWLETT-PACKARD e-Diagtools Support Ticket  
-----  
~~~~~  
Your system: HP - zx6000  
Diagnostic: System Test Passed  
Date/Time: 05/01/2003 14:37:41  
~~~~~
```

- ❑ The Support Ticket is a screen that displays a complete record of the test results and the system's configuration. It is the most effective way of communicating this essential information to your support provider.
 - ❑ The current Support Ticket is the one produced by the last execution of e-Diagtools. When running e-Diagtools, you can create a Support Ticket on demand in the Configuration Description Screen. When you run the basic system tests or advanced system tests, a Support Ticket is created automatically. Use the Support Ticket Screen to browse it for information that can help you troubleshoot your system.
 - ❑ Have the support ticket on the screen when you contact customer support. (Use the arrow keys to scroll if necessary.) The support representative may ask you to read the information over the phone.
5. Press **3** to exit the Support Ticket tool.

Offline Diagnostics Environment (ODE)

The Offline Diagnostics Environment is an offline support tools platform that enables users to troubleshoot a system that cannot be tested using online tools. These may be accessed through the HP e-DiagTools Hardware Diagnostics menus or as separate applications. The offline environment is also useful for some types of testing in which it is not desirable to have to boot the system first.

Tools Provided

The ODE includes a variety of diagnostics tools. Depending on your system and configuration, these may include some or all of the following tools, plus additional system-specific tools:

- MAPPER is an offline system configuration mapping utility. It identifies and displays a list of system components including hardware modules and peripheral devices.
- CPUDIAG is a CPU diagnostics tool.
- MEMDIAG is a memory diagnostics tool.
- PERFVER is a utility for testing peripherals attached to the boot path.

To access a detailed list of tools provided on your system, from the ODE Main Menu:

1. Select **View Release Notes and Documentation Menu**
2. Browse the documentation and release notes.

running ODE from the offline Diagnostics and Utilities CD

ODE uses a command line interface, which allows the user to select specific tests and/or utilities to execute on a specific hardware module.

To run ODE from the *HP IPF Offline Diagnostics and Utilities CD*:

1. Insert the CD into the CD/DVD drive and reset system power, the system should come up to the boot manager.
2. If the boot manager is already configured, and the CD/DVD drive is configured as one of the boot devices, you move the cursor to the line which shows the CD/DVD drive, and press **Enter**. The CD then will boot to the Launch Menu.
3. Select **Run the Off-line Diagnostic Environment (ODE)** from the launch menu.

NOTE: If you are unable to boot from your CD/DVD drive, restart your system and check the boot options from the **Boot Options Maintenance Menu** to ensure that your system is configured to boot from the CD/DVD drive.

For further information, see <http://docs.hp.com/hpux/diag> under the section titled “Offline Diagnostics.” This site includes links to a FAQ, conceptual overview, and a quick reference guide to ODE. Also see the section titled “Diagnostics (Support Tools) General,” especially the *SupportPlus: Diagnostic User's Guide*, Chapter 3. “Using the SupportPlus Media to Run Offline Diagnostics” is a useful chapter for more information on what ODE is, and how to run it.

NOTE: Ignore references to the SupportPlus Media in the SupportPlus User's Guide, Chapter 3: they do not apply to zx6000 or rx2600 systems. However, the conceptual and procedural information still applies to IPF systems. Any discrepancies have been noted and explained in the *SupportPlus User's Guide*, and elsewhere, as appropriate.

System Accessories

This appendix contains information about the graphics cards and mass storage devices supported on the HP Integrity rx2600 server and HP workstation zx6000:

- For photographs of internal system components, see Chapter 2.
- For a list of system components and part numbers, see Appendix C.
- For additional information on supported accessories and components, visit:

<http://www.hp.com/go/bizsupport>.

Graphics Cards

HP Integrity rx2600 server and HP workstation zx6000 systems with Management Processor (MP) cards support a VGA monitor connected to the VGA port on the MP card.

zx6000 workstations with **no** MP cards are available with a range of AGP graphics cards:

- Graphics cards may include an 15-pin connector, an 18-pin connector, or both. Only one connecting cable is needed for each monitor.
- Some video cards are pre-installed in the system, while others are packaged separately and shipped with the system. If your system did not ship with a pre-installed graphics card, you must install the card and load the drivers. Refer to the documentation included with your graphics card for instructions.

NOTE: If you are running HP-UX or Linux with a graphics card but choose not to run X Server, there are several ways to prevent X Server from starting automatically. Refer to “Management Processor Card” in Chapter 3.

Supported Graphics Cards for systems with no MP card

Depending on the OS on your system, you may have one of the following graphics cards. For a complete and current list of supported cards, see:

<http://www.hp.com/go/bizsupport>

Type of Card	HP-UX	Linux	Windows
High End 3D	ATI FIRE GL 4 ATI FIRE GL X1/Z1	nVIDIA Quadro4 900XGL nVIDIA Quadro4 980XGL	nVIDIA Quadro4 900XGL nVIDIA Quadro4 980XGL ATI FIRE GL X1/Z1
Entry 3D		nVIDIA Quadro2 EX	
Professional 2D	ATI Radeon 7000	ATI Radeon 7000	ATI Radeon 7000

■ For more detailed information about your graphics card, see the manufacturer's web site:

- ATI: **www.ati.com**
- NVIDIA: **www.NVIDIA.com**

Selecting a Monitor

Use the supported resolutions and frequencies to select the appropriate monitor for your graphics card. Frequencies of 75-85Hz and higher (depending on monitor size) provide ergonomic flicker-free viewing on analog CRT monitors. Displays using DVI never flicker; the refresh rate changes the speed at which the image is updated. Anything over 48 frames/sec. is considered “smooth motion.”

If the monitor you select is DDC-2B or DDC-2B+ compliant, the graphics card automatically limits itself to the resolutions and frequencies supported by that monitor. In this case, you do not need to use the tables in this section to select your monitor. If the display mode you desire is supported by your video card and monitor, but not part of VESA or is not programmed into the monitor’s DDC-ROM, you may override the defaults.

On the tables that follow:

- Only common resolutions are listed. Other intermediate resolutions are possible.
- High frequencies may not be available at all color depths.



CAUTION: To prevent possible damage to your monitor, make sure you select a monitor that supports the resolutions and frequencies you want to use.

Supported Resolutions and Frequencies

ATI FIRE GL 4

Analog Monitor with DB-15 Connector

Display Resolution	Vertical Frequency (Hz)
1024×768	60, 75, 85, 100
1280×1024	60, 75, 85, 100
1600×1200	60, 75, 85, 100
1920×1200	60, 75, 85, 100

Digital Monitor with DVI Connector

Display Resolution	Vertical Frequency (Hz)
1024×768	60, 75
1280×1024	60, 75
1600×1200	60

ATI FIRE GL X1/Z1

NOTE: Support for two analog or digital monitors. You can set resolutions and refresh rates independently for two connected displays.

Analog or Digital Monitor with DB-15 Connector

Display Resolution	Vertical Frequency (Hz)
800×600	60, 75, 85, 100
1024×768	60, 75, 85, 100
1280×1024	60, 75, 85, 100
1600×1200	60, 75, 85
1920×1200	60, 75

Digital Monitor with DVI Connector

Display Resolution	Vertical Frequency (Hz)
800×600	60, 75
1024×768	60, 75
1280×1024	60, 75
1600×1200	60

ATI RADEON 7000**Analog Monitor with DB-15 Connector**

NOTE: Can operate with two analog monitors using included converter dongle

Display Resolution	Vertical Frequency (Hz)
640×480	60, 72, 75, 85, 90, 100, 120, 160, 200
800×600	60, 70, 72, 75, 85, 90, 100, 120, 160, 200
1024×768	60, 70, 72, 75, 85, 90, 100, 120, 140, 150, 160, 200
1280×1024	60, 70, 75, 85, 90, 100, 125, 130, 140
1600×1200	60, 66, 70, 72, 75, 76, 85, 90, 100
1920×1200	60, 72, 75, 76, 80, 85
2048×1536	60, 66

Digital Monitor with DVI Connector

Display Resolution	Vertical Frequency (Hz)
640×480	60, 75
800×600	60, 75
1024×768	60, 75
1280×1024	60, 75
1600×1200	60

NVIDIA Quadro4 900XGL

Analog Monitor with DB-15 Connector

NOTE: Includes two built-in digital video ports with analog converter cables

Display Resolution	Vertical Frequency (Hz)
640×480	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
800×600	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
1024×768	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
1280×1024	60, 70, 72, 75, 85, 100, 120, 140, 144, 150
1600×1200	60, 70, 72, 75, 85, 100, 120
1920×1200	60, 70, 72, 75, 85, 100
2048×1536	60, 70, 72, 75

Digital Monitor with DVI Connector

Display Resolution	Vertical Frequency (Hz)
640×480	60
800×600	60
1024×768	60
1280×1024	60
1600×1200	60

NVIDIA Quadro4 980XGL

Analog Monitor with DB-15 Connector

Display Resolution	Vertical Frequency (Hz)
640×480	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
800×600	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
1024×768	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
1280×1024	60, 70, 72, 75, 85, 100, 120, 140, 144, 150
1600×1200	60, 70, 72, 75, 85, 100, 120
1920×1200	60, 70, 72, 75, 85, 100
2048×1536	60, 70, 72, 75

Digital Monitor with DVI Connector

Display Resolution	Vertical Frequency (Hz)
640×480	60
800×600	60
1024×768	60
1280×1024	60
1600×1200	60

NVIDIA Quadro2 EX**Analog Monitor with DB-15 Connector**

Display Resolution	Vertical Frequency (Hz)
640×480	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
800×600	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
1024×768	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170, 200, 240
1280×1024	60, 70, 72, 75, 85, 100, 120, 140, 144, 150, 170
1600×1200	60, 70, 72, 75, 85, 100, 120
1920×1200	60, 70, 72, 75, 85, 100
2048×1536	60, 70, 72, 75

Mass Storage

Supported Hard Drives

The system supports up to three 3.5-inch (1-inch high) hard disk that may be supplied with the system (type and quantity depends on model) on internal shelves, connected to the SCSI controller.

	SCSI (10 krpm)	SCSI (15 krpm)
Capacity	36.4GB, 73.4GB, 146GB	36.4GB, 73.4GB
Interface	Ultra 320 SCSI	Ultra 320 SCSI
Average seek time (read)	4.9ms	3.8ms
Track-to-Track Seek Time (read)	0.55ms	0.4ms
Full Stroke Seek Time (read)	9.2ms	6.7ms
Buffer size	8 MB data buffer	8 MB data buffer

Supported Optical Drives

CD-RW drive

The CD-RW features include:

- CD-ROM data disk (Mode 1 and Mode 2)
- Photo-CD Multisession
- Video CD
- CD-DA
- CD-I FMW
- CD-ROM XA Mode 2 (Form 1 & 2)
- Enhanced CD (CD-Plus, CD-Extra, Pre-gap, Mixed)
- MPC III compliant
- Interface type: E-IDE/ATAPI, supports Ultra DMA 33
- DVD-ROM

Readable disks:

- CD/CD-ROM (12cm, 8cm)
- CD-R
- CD-RW
- DVD-ROM
- DVD-R
- DVD-RW
- DVD+R
- DVD+RW

Writable disks:

- CD-R
- CD-RW

Write/Read Speed	Write (CD-R) 2× to 8× Write (CD-R/W) 2× CD-ROM Read 24× (maximum) DVD Read 8× (read only) DVD-RAM 4× (read only) DVD+R 8× (read only) DVD+RW 4× (read only)
Data capacity	650MB or up to 74 minutes of audio per disc 700MB or up to 80 minutes of audio per extended disk 547MB in CD-UDF data format
Data transfer rate (max.)	600 KB/sec, 3600KB/sec (CD), 10,800KB (DVD)
Access Time	< 100ms
Loading Type	Manual tray
Mounting Type	Horizontal or Vertical
Data Buffer Capacity	2 MB
Rotation Method	<ul style="list-style-type: none"> • Constant Angular Velocity (CAV) • Constant Linear Velocity
Reliability	MTBF 60,000 POH

DVD-ROM drive

The DVD-ROM drive features include:

- Supported CD-ROM formats:
- CD-ROM Mode 1 and 2 data disk
- Photo-CD Multisession
- CD Audio disk
- Mixed mode CD-ROM disk (data and audio)
- CD-ROM XA, CD-I, CD-Extra, CD-R, CD-RW

Supported DVD-ROM formats:

- DVD-ROM
- DVD-R (4.7GB/3.9GB)
- DVD-RAM (4.7GB/2.6GB)
- DVD-RW
- DVD+RW

Interface: E-IDE/ATAPI, Support Ultra DMA 33.

Data Capacity:	
DVD-ROM	Up to 8.5 GB/side
DVD-RAM	4.7 GB/side
DVD-R	4.7 GB/side
DVD+R	4.7 GB/side
DVD+RW	4.7 GB/side
CD	650 MB
Data Transfer Rate	
	8× (maximum) DVD/DVD+R
	24× (maximum) CD-ROM
	4× (maximum) DVD-RAM
	4× (maximum) DVD+RW
Loading Type	Manual tray
Access Time	
	120ms (DVD)
	90ms (CD-ROM)
	210ms (DVD-RAM)
Data Buffer Capacity	256 KB
Acoustic Noise	45 dB
Reliability	MTBF 60,000 POH

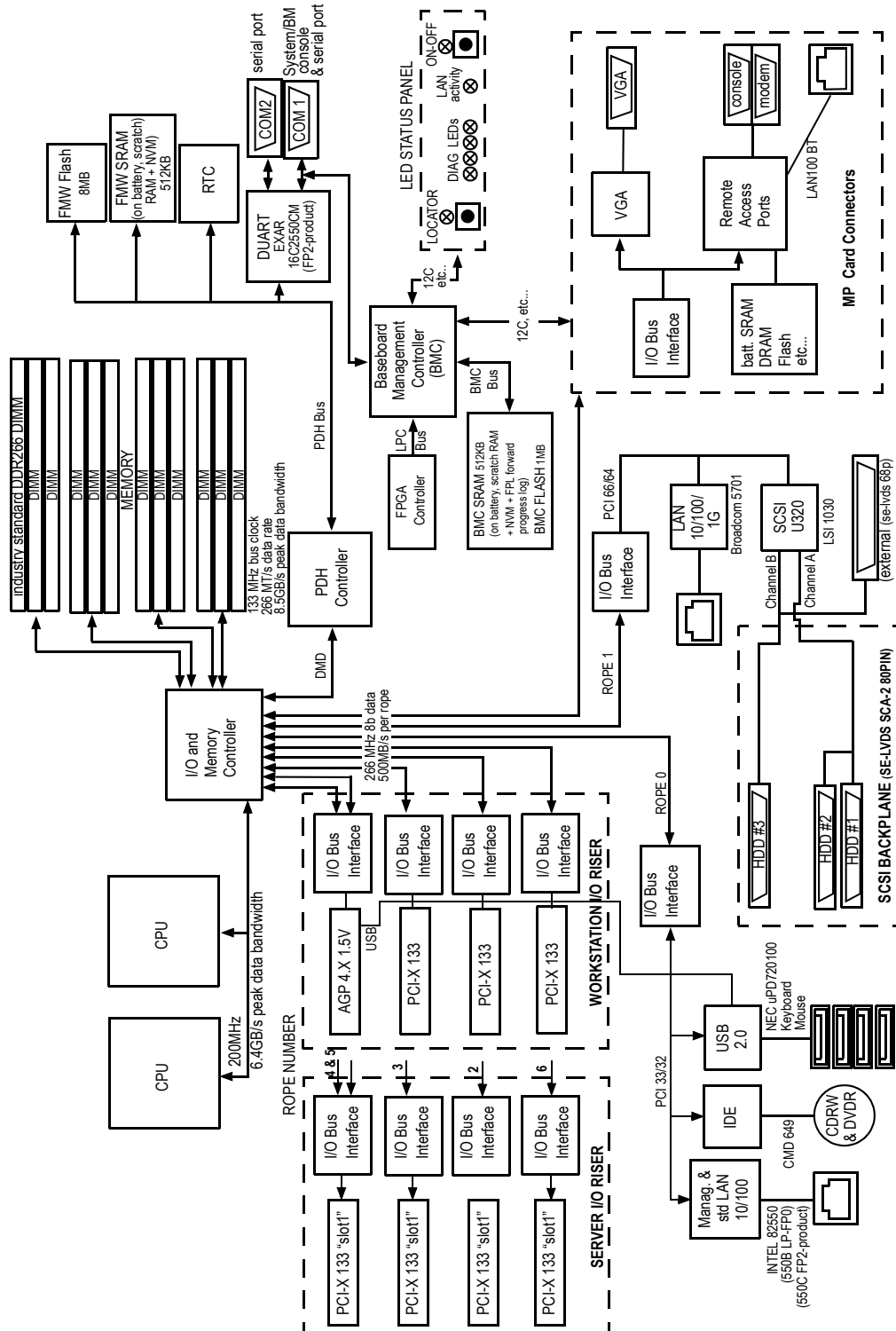
System Board

This appendix provides an overview of the system board and describes key components (chips) on the board:

- Intel® Itanium® 2 Processor (one or two processors supported)
- ZX1 I/O and memory controller
- ZX1 AGP/PCI bus controller
- Processor-dependent hardware controller
- Dual serial controller
- Field processor gate array controller
- Baseboard Management Controller
- SCSI controller
- IDE controller
- USB controller
- 10/100BT Standard/Management LAN
- 10/100/1000 LAN

System Board Overview

This section provides a block diagram of the system board. For a photograph of the system board connectors, "Location of Internal Components and Connectors" on page 2-2.



Block Diagram of the System Board

Intel® Itanium® 2 Processor

The Intel® Itanium® 2 processor provides the following features:

- Eight-stage pipeline, six general-purpose ALUs, two integer units, one shift unit, four floating-point units
- Split L1 cache :
 - 16 KB, 4-way set associative data cache
 - 16 KB, 4-way set associative instruction cache
 - 64 byte line size
- Unified L2 cache:
 - 256 KB, 8-way set associative
 - 128 byte line size
- Unified L3 cache:
 - 1.5 MB, 6-way set associative (900 MHz)
 - 3MB, 12-way set associative (1 GHz)
 - 3MB, 12-way set associative (1.3 GHz)
 - 6MB, 24-way set associative (1.5 MHz)
 - 128 byte line size

Processor Bus

The Intel® Itanium® 2 processor bus (Front Side Bus, FSB) in this product runs at 200 MHz. Data on the FSB are transferred at a double data rate, which allows a peak FSB bandwidth of 6.4 GB/sec.

ZX1 I/O and Memory Controller

The rx2600 and zx6000 support the following features of the ZX1 I/O and memory controller chip:

- 3.3 GB/s peak I/O bandwidth through 7 concurrent I/O links.
- Peak memory bandwidth of 8.5 GB/s.
- 2 memory cells, 144 data bits each.

ZX1 AGP/PCI Bus Interface

The ZX1 AGP/PCI bus interface provides these features:

- Provides industry standard AGP 1× and 2× support for legacy graphics, and AGP 4× for current high performance graphics.
- Provides industry standard PCI 33MHz & 66MHz, PCI-X 66MHz to 133MHz, 32 or 64 data bit support.
- Supports AGP fast writes (only to addresses less than 4 GB).
- Supports 3.3V or Universal keyed PCI cards. 5V keyed PCI cards are not supported.
- Uses peer-to-peer (P2P) subset that is required by the AGP specification (write-only, PCI cycles).

Dual Serial Controller

The dual serial controller is a dual universal asynchronous receiver and transmitter (DUART). This chip provides enhanced UART functions with 16-byte FIFOs, a modem control interface. Registers on this chip provide onboard error indications and operation status. An internal loopback capability provides onboard diagnostics.

Features include:

- Data rates up to 115.2kbps
- 16550A fully compatible controller
- A 16-byte transmit FIFO to reduce the bandwidth requirement of the external CPU
- A 16-byte receive FIFO with four selectable interrupt trigger levels and error flags to reduce the bandwidth requirement of the external CPU
- UART control that provides independent transmit and receive
- Modem control signals (-CTS, -RTS, -DSR, -DTR, -RI, -CD, and software controllable line break)
- Programmable character lengths (5, 6, 7, 8) with Even, Odd or No Parity
- A status report register

Field Programmable Gate Array

The field programmable gate array (FPGA) provides ACPI and LPC support for HP Intel® Itanium® 2 platforms based on HP chipsets. This controller provides these features:

- ACPI 2.0 interface
- LPC bus interface to support BMC
- Decoding logic for PDH devices

Baseboard Management Controller

The baseboard management controller supports the industry-standard Intelligent Platform Management Interface (IPMI) specification. This specification describes the management features that have been built into the system board. These features include: diagnostics (both local and remote) console support, configuration management, hardware management and troubleshooting.

The baseboard management controller provides the following:

- Compliance with Intelligent Platform Management Interface 1.0
- Tachometer inputs for fan speed monitoring
- Pulse width modulator outputs for fan speed control
- Push-button inputs for front panel buttons and switches
- One serial port, multiplexed with the system console port
- Remote access and intelligent chassis management bus (IC MB) support
- Three I²C master/slave ports (one the ports is used for IP MB)
- Low pin count (LPC) bus provides access to three keyboard controller style (KCS) and one-block transfer (BT) interface
- 32-bit ARM7 RISC processor
- 160-pin low profile flat pack (LQFP) package
- Firmware is provided for the following interfaces:
 - Intelligent platform management interface (IPMI)
 - Intelligent platform management bus (IP MB)

SCSI Controller

The SCSI controller is an LSI Logic 53C1030 chip. This chip is fully compliant with the SCSI Peripheral Interface-4 Specification (SPI-4). It has two independent SCSI channels supporting devices at speeds up to 320 MB/sec each.

IDE Interface

The IDE interface provides support for an internal CD-RW or a DVD reader through an internal IDE connector and cable. This interface supports the master capability.

The IDE controller (PCI649) supports the ATAPI zero (0) to five (5) modes (from 16 to 100 MB/s). The usable speed on this system is limited to 16MHz (ATA-33 mode, 33 MB/s) because the slimline CD/DVD devices do not support the ATA-66 and 100 modes.

The primary IDE channel is the only channel that is implemented. The IDE cable provides only one drive connector, of the Master type, for the optical storage peripheral.

10/100 BT Standard/Management LAN

The 10/100 BT LAN port provides:

- Basic remote manageability features on the core system.
- A management LAN interface for operating system level manageability applications such as Tootools.
- The LAN controller is an Intel® 82550 chip.
- Power-On-LAN is an additional feature that the LAN controller provides. Power-On-LAN allows you the ability to power up a system remotely through the LAN by sending special LAN packets to the system to be powered on.

1GB System LAN

- Main system LAN
- 10/100/1000 Mb capable

USB Connectors

- High speed 480 Mb/sec. capable
- Full speed 12 Mb/sec. and low speed 1.5 Mb/sec.
- Support for USB keyboard and mouse:
 - HP-UX supports HP USB keyboard and mouse
 - Linux supports all 1.1 USB devices
 - Windows supports USB keyboard and mouse

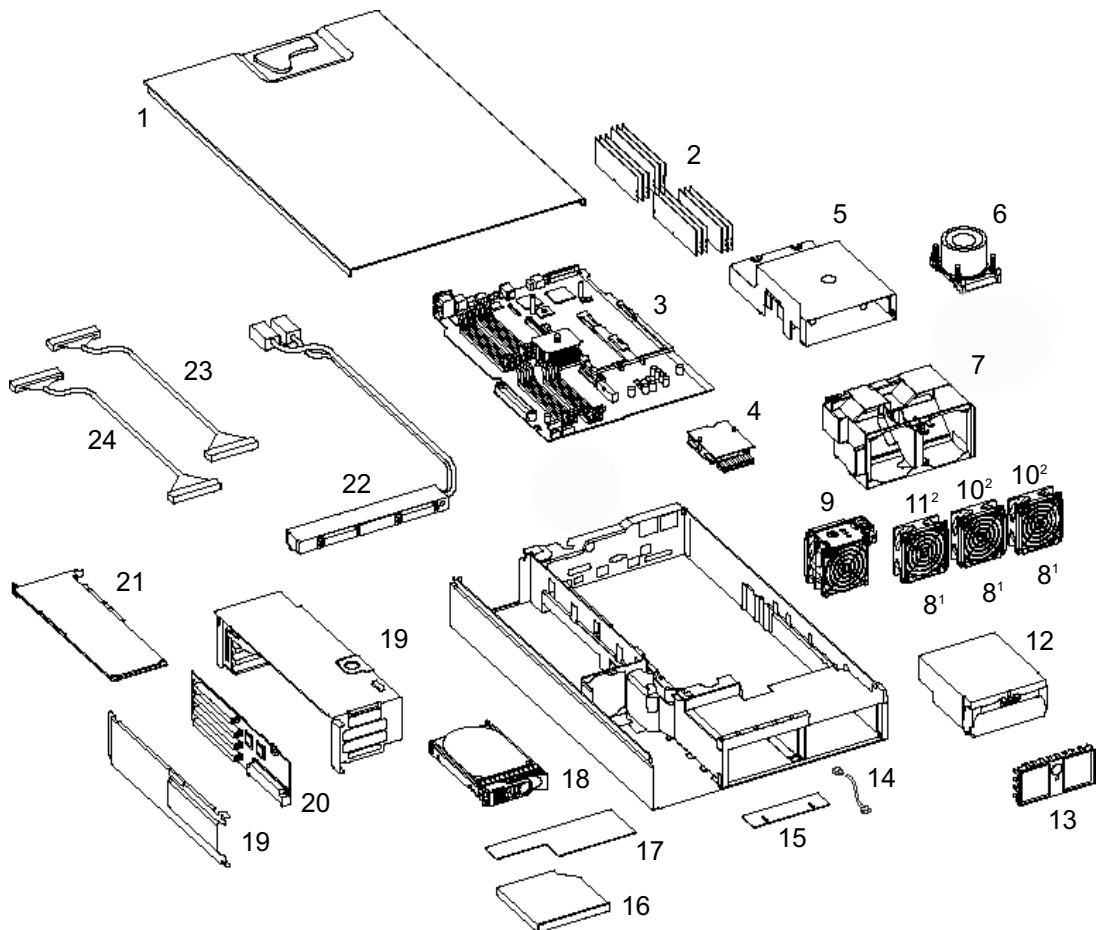
Chip Spare Functionality (rx2600 Systems Only)

Chip spare enables an entire DDR SDRAM chip on a DIMM to be bypassed in the event that a multi-bit error is detected on the DDR SDRAM. In order to use the chip spare functionality on your system, only DIMMs built with ×4 DDR SDRAM parts can be used, and these DIMMs must be loaded in quads (see page 2-24).

Part Numbers

This appendix contains an overview of system accessories, an exploded view of HP Integrity rx2600 server and HP workstation zx6000 components, and a components parts list. For complete and current information on supported accessories and components, visit <http://partsurfer.hp.com>.

zx6000 Workstation Parts



Exploded View of zx6000 Parts

NOTE: Use the correct fans for your system, as shown by footnotes in the diagram above:

1. Tower system
2. Rack-mounted system

The following list is for reference only and is subject to change. For the latest parts information, visit:

<http://partsurfer.hp.com>

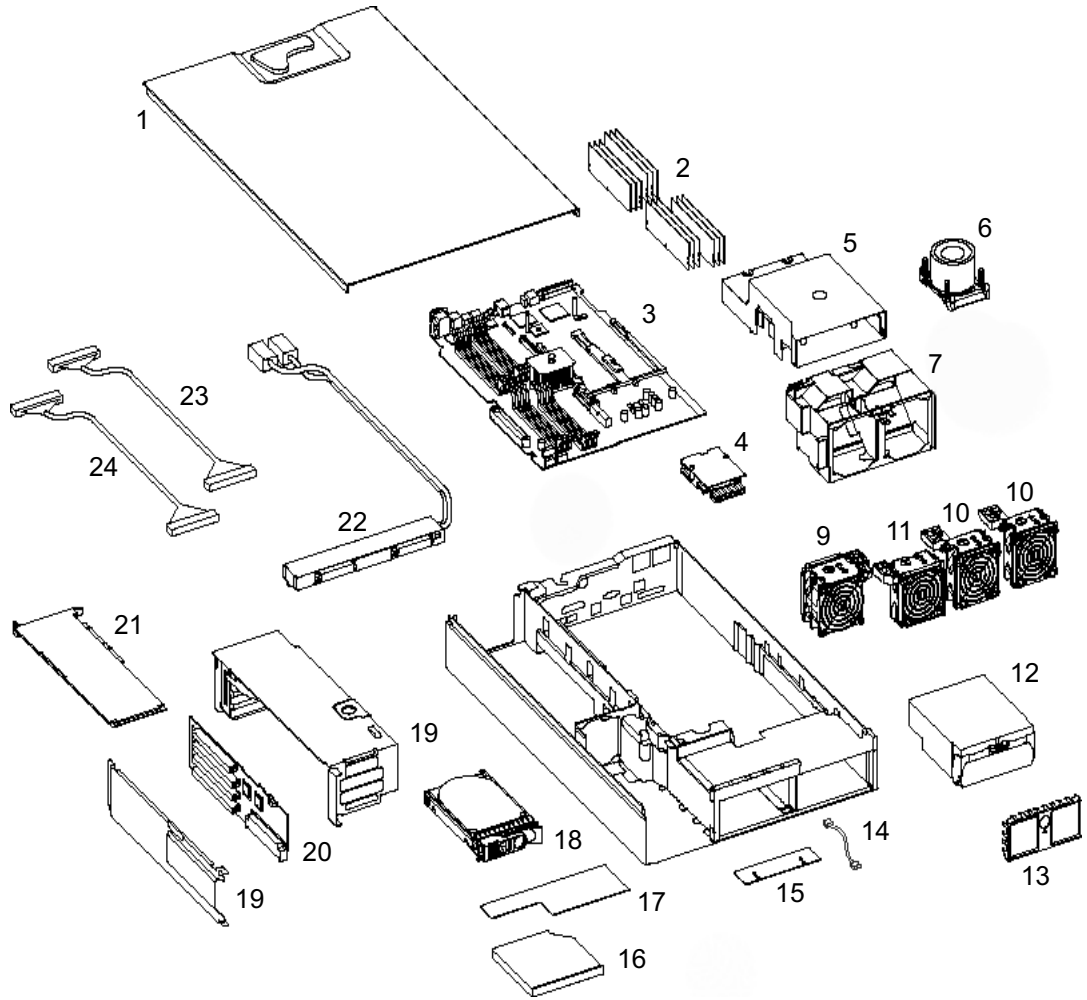
Item	Description	Replacement	Exchange
System Components			
3	zx6000 workstation system board	A7231-67510	A7231-69510
20	zx6000 workstation AGP board	A7231-66540	N/A
22	Power supply interface module	A7231-04018	N/A
N/A	SCSI backplane	A7231-66520	A7231-69520
15	Status panel	A7231-66550	N/A
Processor			
6	Intel® Itanium® 2, 900 MHz	A7231-62039	A7231-69039
6	Intel® Itanium® 2, 1.0 GHz	A7231-62030	A7231-69030
6	Intel® Itanium® 2, 1.3 GHz	A9666-67010	A9666-69010
6	Intel® Itanium® 2, 1.5 GHz	A9667-67010	A9667-69010
N/A	Processor Tool	A7231-67046	N/A
Hard Drives			
18	36 GB 10 krpm, Ultra 160 SCSI, Carbon	A7835-64001	A7835-69001
18	36 GB 10 krpm, Ultra 320 SCSI, Carbon	A7835-64002	A7835-69002
18	36 GB, 10 krpm, Ultra 320 SCSI, Carbon/Port	A7835-64003	A7835-69003
18	36GB, 15 krpm, Ultra320 SCSI, Carbon	A7836-64001	A7836-69001
18	36 GB, 15 krpm, Ultra 320 SCSI, Carbon/Port	A9896-64001	A9896-69001
18	73 GB 10 krpm, Ultra 160 SCSI, Carbon	A7837-64001	A7837-69001
18	73GB 15 krpm, Ultra 320 SCSI, Carbon	A7838-64001	A7838-69001
18	73 GB, 15 krpm, Ultra 320 SCSI, Carbon/Port	A9897-64001	A9897-69001
18	146GB 10 krpm, Ultra320 SCSI, Carbon	A7839-64001	A7839-69001
18	146 GB, 10 krpm, Ultra320 SCSI, Carbon/Port	A9898-64001	A9898-69001
Memory			
2	256MB PC2100 ECC registered DDR-SDRAM	A6833-60001	A6833-69001
2	512MB PC2100 ECC registered DDR-SDRAM	A6746-60001	A6746-69001
2	1.0GB PC2100 ECC registered DDR-SDRAM	A6834-60001	A6834-69001
2	2.0GB PC2100 ECC registered DDR-SDRAM	A7843-67001	A7843-69001

Item	Description	Replacement	Exchange
Power Supply			
12	600W power supply-AC	A6874-63000	A6874-69000
4	Processor power pod	0950-4294	N/A
Graphics Cards			
21	ATI FireGL 4	A7226-60520	A7226-69520
21	ATI, Fire GLX1, AGP	313287-001	312523-001
21	ATI, Fire GLZ1, AGP	313286-001	N/A
21	ATI Radeon 7000	A8049-60520	A8049-69520
21	nVIDIA Quatro2 EX	A7806-60510	A7806-69510
21	nVIDIA Quatro4 900XGL	A8064-60520	A8064-69520
21	nVIDIA Quadro4 980XGL	308961-001	313285-001
21	DVI-I to DB15 Cable	A6046-63001	N/A
I/O Cards			
21	10/100BT Ethernet	P3492-63000	N/A
21	100BT Ethernet	B5509-66001	N/A
21	Single channel ultra 160 SCSI adapter	A6829-60001	N/A
21	SCSI adapter, dual port HVD/FW, PCI bus	A5159-60001	N/A
21	LAN adapter, 1000 SX Gigabit	A6847-67101	N/A
21	LAN adapter, 1000 SX Gigabit	A6825-67001	N/A
21	Fibre channel card, 2Gb, single port	A6795-62001	A6795-69001
21	100BTX Four Port	A5506-60102	A5506-69102
21	100BaseT PCI LAN adapter and L	B5509-66001	N/A
21	FireWire	5185-8203	N/A
21	Audio card	A7784-60501	N/A
17	Management Processor card	A7231-66580	A7231-69580

Item	Description	Replacement	Exchange
Fans			
10	Super 80mm fan (zx6000 rack)	A7231-04014	N/A
11	Thin 80mm fan (zx6000 rack)	A7231-04015	N/A
9	Dual fan (zx6000 tower and rack)	A7231-04033	N/A
8	Standard 80mm fan (zx6000 tower)	A7231-04017	N/A
Cables			
N/A	IDE cable	A7231-63002	N/A
23	SCSI cable A	A7231-63017	N/A
24	SCSI cable B	A7231-63018	N/A
14	Status panel cable	A7231-63003	N/A
N/A	Audio cable	8121-0808	N/A
N/A	Disk power cable	A7231-63004	N/A
N/A	80mm fan cable	A7231-63006	N/A
N/A	Super 80mm fan cable	A7231-63005	N/A
N/A	DVI-I to DB15, converter dongle	A6064-63001	N/A
Plastic Covers/Metal Latches and Chassis			
N/A	Right-side rack latch	A7231-04023	N/A
N/A	Right-side rack bezel (carbon)	A7231-04038	N/A
N/A	Left-side rack bezel (carbon) and latch	A7231-04039	N/A
N/A	Optical drive blank (carbon)	A7231-40027	N/A
N/A	Hard disk drive blank (carbon)	A6198-60003	N/A
1	System cover	A7231-04003	N/A
N/A	Rack nameplate (zx6000 rack)	A7231-40032	N/A
5	Main airflow guide (plastic)	A7231-04034	N/A
7	Front half of the airflow guide (metal)	A7231-04004	N/A
19	PCI/AGP cage	A7231-04006	N/A

Item	Description	Replacement	Exchange
Tower and Rack Kit			
N/A	Tower pedestal	A7231-04028	N/A
N/A	Tower pedestal covers	A7231-04041	N/A
N/A	Tower front panel	A7231-40040	N/A
N/A	Tower top cover	A7231-40036	N/A
N/A	Tower nameplate	A7231-40039	N/A
N/A	Rack standard slide, middle weight	5064-9670	N/A
N/A	Rack cable management arm	5065-5963	N/A
Optical Devices			
16	DVD-ROM drive, Slimline, Carbon	A7231-67012	A7231-69012
16	CD-RW/DVD-ROM drive, Slimline, Carbon	A7231-62014	A7231-69014
Keyboards and Mice			
N/A	KBD, USB, Trad. Chinese, PC-104, Quartz	A7861-65323	N/A
N/A	KBD, USB, Korean, PC-106, Quartz	A7861-65321	N/A
N/A	KBD, USB, US English, PC-104, Quartz	A7861-65301	N/A
N/A	KBD, USB, German, PC-105, Quartz	A7861-65303	N/A
N/A	KBD, USB, Spanish, PC-105, Quartz	A7861-65304	N/A
N/A	KBD, USB, French, PC-105, Quartz	A7861-65305	N/A
N/A	KBD, USB, Swiss, PC-105, Quartz	A7861-65311	N/A
N/A	KBD, USB, UK English, PC-105, Quartz	A7861-65313	N/A
N/A	KBD, USB, Japan, JIS-109, Quartz	A7861-65324	N/A
N/A	KBD, USB, Italian, PC-105, Quartz	A7861-65317	N/A
N/A	KBD, USB, Simple Chinese, PC-104, Quartz	A7861-65322	N/A
N/A	KBD, USB, Intl. English, PC-104, Quartz	A7861-65342	N/A
N/A	3-button scroll mouse, USB	A4983-60101	N/A
N/A	3-button mouse, USB	A4983-60111	N/A

Integrity rx2600 Server Parts



Exploded View of the rx2600 Parts

The following list is for reference only and is subject to change. For the latest parts information, visit <http://partsurfer.hp.com>.

Item	Description	Replacement Exchange	
System Components			
3	rx2600 system board	A7231-66010	A7231-69010
20	PCI board	A7231-66530	N/A
22	Power supply interface module	A7231-04018	N/A
N/A	SCSI backplane	A7231-66520	A7231-69520
15	Status panel	A7231-66550	N/A
Processor			
6	Intel® Itanium® 2, 900 MHz	A7231-62034	A7231-69034
6	Intel® Itanium® 2, 1.0 GHz	A7231-62030	A7231-69030
6	Intel® Itanium® 2, 1.3 GHz	A9666-67010	A9666-69010
6	Intel® Itanium® 2, 1.5 GHz	A9667-67010	A9667-69010
N/A	Processor Tool	A7231-67046	N/A
Hard Drives			
18	36 GB 10 krpm, Ultra 160 SCSI, Flint	A6724-64001	A6538-69001
18	36 GB 10 krpm, Ultra 160 SCSI, Flint	N/A	A6571-69001
18	36GB, 15krpm, Ultra320 SCSI, Flint	A6981-64001	A7329-69001
18	36 GB, 15 krpm, Ultra 320 SCSI, Carbon/Port	A9896-64001	A9896-69001
18	73 GB 10 krpm, Ultra 160 SCSI, Flint	A6725-64001	A6539-69001
18	73 GB 10 krpm, Ultra 160 SCSI, Flint	N/A	A7285-69001
18	73GB 15K Ultra 320 SCSI, Flint	A6983-64001	A7286-69001
18	73 GB, 15 krpm, Ultra 320 SCSI, Carbon/Port	A9897-64001	A9897-69001
18	146GB 10K Ultra 320 SCSI, Flint	A6984-64001	A7287-69001
18	146 GB, 10 krpm, Ultra320 SCSI, Carbon/Port	A9898-64001	A9898-69001
Memory			
2	256MB PC2100 ECC registered DDR-SDRAM	A6833-60001	A6833-69001
2	512MB PC2100 ECC registered DDR-SDRAM	A6746-60001	A6746-69001
2	1.0GB PC2100 ECC registered DDR-SDRAM	A6834-60001	A6834-69001
2	2.0GB PC2100 ECC registered DDR-SDRAM	A7843-67001	A7843-69001

Item	Description	Replacement Exchange	
Power Supply			
12	600W power supply-AC	A6874-63000	A6874-69000
4	Processor power pod	0950-4294	N/A
I/O Cards			
21	For supported I/O cards, visit: http://partsurfer.hp.com		
17	Management Processor card	A7231-66580	A7231-69580
Fans			
10	Super 80mm fan (rx2600 tower and rack)	A7231-04014	N/A
11	Thin 80mm fan (rx2600 tower and rack)	A7231-04015	N/A
9	Dual fan (rx2600 tower and rack)	A7231-04033	N/A
Cables			
N/A	IDE cable	A7231-63002	N/A
23	SCSI cable A	A7231-63017	N/A
24	SCSI cable B	A7231-63018	N/A
14	Status panel cable	A7231-63003	N/A
N/A	Audio cable	8121-4373	N/A
N/A	Disk power cable	A7231-63004	N/A
N/A	80mm fan cable	A7231-63006	N/A
N/A	Super 80mm fan cable	A7231-63005	N/A
N/A	DVI-I to DB15, converter dongle	A6064-63001	N/A

Item	Description	Replacement	Exchange
Plastic Covers/Metal Latches and Chassis			
N/A	Right-side rack latch	A7231-04023	N/A
N/A	Right-side rack bezel (grey)	A7231-04025	N/A
N/A	Right-side rack bezel (graphite)	A7231-04053	N/A
N/A	Left-side rack bezel (grey) and Latch	A7231-04030	N/A
N/A	Left-side rack bezel (graphite) and Latch	A7231-04055	N/A
N/A	Optical drive blank (graphite)	A7231-40027	N/A
N/A	Hard drive blank (graphite)	A6198-60003	N/A
N/A	Optical drive blank (grey)	A7231-40026	N/A
N/A	Hard disk drive blank (grey)	A6198-60002	N/A
1	System cover	A7231-04003	N/A
N/A	Management cover plate	A7231-00072	N/A
5	Main airflow guide (plastic)	A7231-04034	N/A
7	Front half of the airflow guide (metal)	A7231-04004	N/A
19	PCI/AGP cage	A7231-04006	N/A
N/A	Rack nameplate	A7231-40003	N/A
N/A	Tower nameplate	A7231-40025	N/A
Tower and Rack Kit for the rx2600			
N/A	Tower Pedestal	A7231-04028	N/A
N/A	Tower covers	A7231-04036	N/A
N/A	Tower front panel	A7231-40026	N/A
N/A	Tower top cover	A7231-40021	N/A
N/A	Rack standard slide, middle weight	5064-9670	N/A
N/A	Rack cable management arm	5065-5963	N/A
Optical Devices			
16	DVD-ROM drive, Slimline, Gray	A7231-62011	A7231-69011
16	DVD-ROM drive, Slimline, Carbon	A7231-67012	A7231-69012
16	CD-RW/DVD-ROM drive, Slimline, Gray	A7851-62015	A7851-69015
16	CD-RW/DVD-ROM drive, Slimline, Carbon	A7231-62024	A7231-69024

Item	Description	Replacement Exchange	
Keyboards and Mice			
N/A	KBD, USB, Trad. Chinese, PC-104, Quartz	A7861-65323	N/A
N/A	KBD, USB, Korean, PC-106, Quartz	A7861-65321	N/A
N/A	KBD, USB, US English, PC-104, Quartz	A7861-65301	N/A
N/A	KBD, USB, German, PC-105, Quartz	A7861-65303	N/A
N/A	KBD, USB, Spanish, PC-105, Quartz	A7861-65304	N/A
N/A	KBD, USB, French, PC-105, Quartz	A7861-65305	N/A
N/A	KBD, USB, Swiss, PC-105, Quartz	A7861-65311	N/A
N/A	KBD, USB, UK English, PC-105, Quartz	A7861-65313	N/A
N/A	KBD, USB, Japan, JIS-109, Quartz	A7861-65324	N/A
N/A	KBD, USB, Italian, PC-105, Quartz	A7861-65317	N/A
N/A	KBD, USB, Simple Chinese, PC-104, Quartz	A7861-65322	N/A
N/A	KBD, USB, Intl. English, PC-104, Quartz	A7861-65342	N/A
N/A	3-button scroll mouse, USB	A4983-60101	N/A
N/A	3-button mouse, USB	A4983-60111	N/A

Event, Error and Warning Messages

This appendix contains event, error and warning information for the rx2600 and zx6000 systems:

- “EFI Error and Warning Messages” on page D-1
- “SEL and FPL Log Entries” on page D-4

EFI Error and Warning Messages

EFI error and warning messages are displayed on the console as part of the boot process. They can also be retrieved via the **info warnings** EFI command.

Error Number	Error/Warning Message	Solution
2	Insufficient resources to assign to one or more I/O devices	—
3	Failed I/O socket(s) deconfiguration	—
4	Unexpected hardware I/O configuration	—
7	No BMC installed in platform	Ensure the BMC ROM is installed; update BMC firmware
8	BMC cannot be accessed	Check BMC logs for errors
9	One or more BMC ports failed	—
10	BMC system event log is full	Clear SEL
11	Platform SCR is bad	Call support center
12	Set time to BMC SEL failed	—
13	SEL get info failed	—
14	Initial BMC SEL event failed	—
15	Update of BMC buffered data failed	—
16	All ACPI BMC ports bad	—
17	Read error on BMC token	—
18	BMC token transmit checksum error	—
19	Error writing BMC token on download	—
20	NVM token access error	—
21	BMC token write error during NVM write through	—

Error Number	Error/Warning Message	Solution
22	Error reading BMC token on upload to NVM	—
23	Error reading BMC first boot token	—
24	Primary FIT failed	Reflash firmware
25	Secondary FIT failed	Reflash firmware
26	PAL_A warning. One copy of PAL is bad	Reflash firmware
27	PAL_B warning. Not compatible with at least one CPU	Update firmware
28	Memory errors detected and PDT is disabled	Reseat DIMMs, if error persists replace bad DIMMs
30	Memory required reinterleave to get a good page 0	—
31	One or more ranks have chipspare disabled	—
33	One or more memory ranks are mismatched and deallocated	Fix memory loading order (page 2-25)
34	Memory deallocated because of a loading error	Fix memory loading order (page 2-25)
35	Memory is not loaded recommended loading order	Fix memory loading order (page 2-25)
36	The PDT is full	Clear with <code>pdt clear</code> command in EFI shell
37	At least one (1) CPU has bad fixed core ratio	—
38	All CPUs were slated for compatibility deconfig	—
39	Incompatible CPUs detected	Call support center
40	CPUs installed with mixed cache sizes	This will always cause a stopboot
41	CPUs installed with mixed steppings	—
42	All CPUs are over clocked	—
43	At least one (1) CPU is over clocked	—
44	Monarch changed to lowest stepping CPU	Only seen once after monarch is set to lowest stepping
46	CPUs loaded in wrong order	—
48	SAL NVM cleared	Information only, no action required

Error Number	Error/Warning Message	Solution
49	EFI NVM cleared	Information only, no action required
50	EFI NVM failed	—
51	CPU deconfigured by SAL_B	—
52	A ROM revision is inconsistent with FIT or REVBLOCK	One or more firmware components (fw, bmc, mp) is out of date. Update Firmware.
53	Error building SMBIOS	Call Support Center
54	Failure constructing the EFI Memory Data Table (MDT)	Call Support Center
55	UUID error	Call Support Center
56	Error reading CPU SMBUS information ROM	—
57	Error accessing FRU information	—
58	Checksum error accessing FRU information	—
59	FRU information version error	—

SEL and FPL Log Entries

This section is a quick reference for the IPMI events recorded in the SEL and FPL files. These logs are available via the MP card interface or the BMC CLI.

- All entries from the SEL are forwarded to the FPL. The FPL is a circular log so the newest entries replace the oldest. The FPL contains forward progress messages from the BMC, System firmware, EFI, and the OS.
- The SEL will not accept new entries once it is full and contains only those events considered of major importance to system operation.
- Both contain type 02 and E0 messages.
- A triplet is formed from the **SensorType**, **EventType**, and the lower nibble of the **Data1** fields of Type 02 events. MP firmware displays the triplet in the *Keyword* field.

NOTE: Systems with with Firmware version 2.0 or higher also have a **clearlogs** command that will clear out the log files should they become full.

Accessing the Logs with BMC CLI Commands

The **fpl** command displays the *forward progress log*. For example:

```

1      2 3      4      5      6      7
0000000E - Pwr Spply 1 Ctrl Enabled 44-08:09:01 2003-02-28 16:41:46
0000000F 2 CPU0 Boot start 00063 DT 06 0000000000000000
00000010 2 CPU0 Boot start 00063 Time 2003-02-28 16:41:46
00000011 0 CPU0 00020 DT 00 0000000000000000
00000012 0 CPU0 0000E DT 06 0000000000010000
00000013 1 CPU0 CPU monarch 0000C DT 06 0000000000000000
00000014 1 CPU0 CPU present 00261 DT 06 0000000000000000
00000015 0 CPU0 00008 DT 00 0000000000000000
00000016 0 CPU0 0024B DT 00 0000000000000000
00000017 0 CPU0 00006 DT 03 0000000000000000
00000018 0 CPU0 00044 DT 06 02000000002C0400
00000019- BMC LPC reset 00-12:70:02 2003-02-28 16:41:47

```

The **sel** command displays the *system event log*. For example:

```

1      2 3 4 5 6 7
00E0 - Pwr Spply 1 Ctrl Enabled 44-08:09:01 2003-02-28 16:41:46
00F0 2 CPU0 Boot start 00063 DT 06 0000000000000000
0100 2 CPU0 Boot start 00063 Time 2003-02-28 16:41:46
0110 - BMC LPC reset 00-12:70:02 2003-02-28 16:41:47

```

Each column in the log contains a different data field:

1. Record ID.
2. Severity for E0 messages.
3. Generator id or sensor reporting the event.
4. Text description of events.
5. Sensor number-Sensor Type:Event Type:Data1 fields for type 02 msgs (triplet) event id for E0 msgs.
6. Data2 and Data3 for type 02 msgs (if applicable) or Data type for E0 messages.
7. Timestamp or extended data specific to the event.

Accessing the Logs with MP Commands

The SEL and FPL data can also be accessed from the MP logs using the MP card **SL** command. Logs can be displayed in three modes: *raw hex*, *text* or *keyword*.

- *MP firmware E.02.10* — The **SDM** (set display mode) command determines the format of the display.
- *MP firmware E.02.20 or higher* — Output mode is selected from a menu when the log is displayed.

Hex Mode Example:

```
13  0x203E5F914A0200E0 FFFF010944080300
14  0x5680006300E000F0 010000003E5F914A
14  0x5680006300E000F0 0000000000000000
15  0x203E5F914B020110 FFFF027000120300
```

Text Mode Example:

```
Log Entry 13: 28 Feb 2003 16:41:46
Alert Level 2: Informational
Keyword: Type-02 080901 526593
Power supply turned on
Logged by: BMC; Sensor: Power Supply - Pwr Spply 1 Ctrl
Data1: Device Enabled
0x203E5F914A0200E0 FFFF010944080300
```

```
Log Entry 14: 28 Feb 2003 16:41:46
Alert Level 2: Informational
Keyword: BOOT_START
CPU starting boot
Logged by: System Firmware 0
Data: Implementation dependent data field
0x5680006300E000F0 0000000000000000
```

```
Log Entry 15: 28 Feb 2003 16:41:47
Alert Level 2: Informational
Keyword: Type-02 127002 1208322
Soft Reset
Logged by: BMC; Sensor: System Event
0x203E5F914B020110 FFFF027000120300
```

Keyword mode example:

```
13   BMC      2  0x203E5F914A0200E0 FFFF010944080300 Type-02 080901 526593
                                     28 Feb 2003 16:41:46
14   SFW  0    2  0x5680006300E000F0 0000000000000000 BOOT_START
                                     28 Feb 2003 16:41:46
15   BMC      2  0x203E5F914B020110 FFFF027000120300 Type-02 127002 1208322
                                     28 Feb 2003 16:41:47
```

System Specific Events

OEM SensorType 12, EventType 71

Missing Components are determined at the time of a power-on request, cause a failure in the request, and cause the event to be logged.

Data2	Data3	Missing Component
0x0C-0F		Power Pod 0-3
0x20-23		CPU 0-3
0x1E	0x01	Cooling Unit 1
0x1E	0x01	Cooling Unit 3
0x1E	0x03	Cooling Unit 3

Chassis Control Event Codes

For BMC rev 1.41+, an SEL event will be logged for each ChassisControl event, whether it's generated by an IPMI request, or a sensor event.

Later revisions of MP firmware recognize the triplet (12:70:A3) as *Chassis Control*.

The EventData fields are:

- Data1: 0xA3 (indicating OEM data in Data2 and Data3, and OEM offset 3)
- Data2:
 - [7] 0 = Request generated by a Sensor Event
 - 1 = IPMI request
 - [6-4] Reserved
 - [3-0] ChassisControl command
- Data3: Sensor Number or IPMI Request Origin

Chassis Control Commands

Command	Description
0x00	Hard Power Down
0x01	Power Up
0x03	Hard Reset
0x04	NMI/TOC/INIT
0x0D	Soft Shutdown and Restart
0x0E	Soft Shutdown

Sensor Numbers

Sensor Number	Description
0x04	Power Button
0x0E	Wake on Lan
0x11-13	Cooling Units
0x40-41	Power Supplies
0xCD-D3, 0xD5-D6	Voltage Sensors
0xD8	Ambient Temp
0xD9-DA	CPU Temps
0xFA	ACPI

IPMI Origins

Number	Source
0x01	BT
0x03	CLI
0x07	IP MB
0x08	I2C1
0x09	I2C2
0x0F	KCS0
0x10	KCS1
0x11	KCS2
0x1F	System Power Thread (Used by Power Restore Policy)

For example:

```
Data2 Data3
80 03 ipmi req from the CLI thd for CHASSIS_CONTROL_POWER_DOWN ("p 0")
81 03 ipmi req from the CLI thd for CHASSIS_CONTROL_POWER_UP ("p 1")
80 01 ipmi req from via BT for CHASSIS_CONTROL_POWER_DOWN
83 03 ipmi/RS req from the CLI thd for CHASSIS_CONTROL_HARD_RESET
00 FA CHASSIS_CONTROL_POWER_DOWN req from the ACPI sensor (S5)
00 D9 CHASSIS_CONTROL_POWER_DOWN req from CPU0 temp sensor
01 0E CHASSIS_CONTROL_POWER_UP req from WakeOnLan sensor
```


Events Without Sensors

The BMC logs these events with a “sensor number” of 0; there is no matching SDR entry.

Triplet	Event	data2	data3	Notes
10:70:64	SEL almost full	1F	%full	The BMC logs this when the SEL is 75% full
12:70:04	BMC entering firmware update mode			
12:70:05	SFW flash Inlock			System firmware update in progress
12:70:06	Front panel lock			Disables all power and reset requests from ipmi or sensors
12:F0:06	Front panel unlock			
12:70:07	Firmware update app: starting component cupdate			
12:F0:07	Firmware update app: ending comionent update			
12:70:80	BMC entering special mode	Mode	–	Mode is a bit-map: Bit 0: Shmoo Bit 1: MfgTest Bit 2: Shutdown override Bit 3: Fixed fan speed Bit 4: Mfg Bits 7-5: unused, set to 0
12:70:A1	BMC firmware initializing	Major FW rev	Minor FW rev	
1D:70:00	BMC cold reset			
1D:70:01	BMC warm reset			
1D:70:02	BMC cold reset after SDRR update			

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