hp Integrity rx1620
Operations Guide

Regulatory Model Number: RSVLA-0406

Second Edition

Manufacturing Part Number: AB430-96005
February 2005

U.S.A.

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1 About This Document

This document describes how to operate your hp Integrity rx1620 Server, Regulatory Model Number: RSVLA-0406.

The document printing date and part number indicate the document's current edition. The printing date will change when a new edition is printed. Minor changes may be made at reprint without changing the printing date. The document part number will change when extensive changes are made.

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What's in This Document

The *hp Integrity rx1620 Operations Guide* contains these chapters:

- **Chapter 2, "Controls, Ports and Indicators."** Use this chapter to learn about the front panel controls, rear panel ports and connectors, and all system LED locations and functions.
- **Chapter 3, "External Connectors."** Use this chapter to learn about all external connectors, plugs, and their pinouts.
- **Chapter 4, "Utilities."** Use this chapter to learn how to utilize the extensible firmware interface (EFI) and management processor commands.
- **Chapter 5, "Troubleshooting."** Use this chapter to learn how to perform minimal troubleshooting of your system.
- **Chapter 6, "Specifications."** Use this chapter to learn the basic mechanical specifications of your HP Server.
- **Appendix A, "Event, Error, and Warning Messages."** Use this appendix to learn more about event, error, and warning messages.
- **Appendix B, "System Information."** Use this appendix to learn the basic system information of your HP Server.

Typographical Conventions

This document uses the following conventions.

Title	The title of a document or a CD.
KeyCap	The name of a keyboard key. Note that **Return** and **Enter** both refer to the same key.
Emphasis	Text that is emphasized.
Bold	Text that is strongly emphasized, such as the summary text in bulleted paragraphs.
`ComputerOut`	Text displayed by the computer.
`UserInput`	Commands and other text that you type.
`Command`	A command name or qualified command phrase.

Related Documents

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Information to Collect Before You Contact Support

Before you contact HP support, you should:

Step 1. Check information on troubleshooting and attempt to solve the problem. See Chapter 5, “Troubleshooting.”

- Note failure symptoms and error indications (LEDs and messages) by checking the SEL and FPL logs.
- Try to determine precisely what did or did not happen.

Step 2. Collect the following information:

- The model number of your server (for example, rx1620).
- The product number of your server. This can be found on the identification label, which is found at the front of the unit (typically A6837B A6838B, and so on).
- The serial number of your server. This can be found on the identification label.

Step 3. Become familiar with your system configuration:

- Are you using the LAN, RS232, or web interface to monitor the server?
- How many processors, DIMMs, and PCI cards have been installed?
- What versions of processor, memory, and PCI cards are used and where are they installed?
- What accessories are installed?

Step 4. Determine the following:

- Which firmware versions are in use?
- When did the problem start?
- Have recent changes been made to the system?
- Which operating system and version is in use?

2 Controls, Ports and Indicators

This chapter describes the controls, ports, and indicators found on the front panel, rear panel, and internal locations of the hp Integrity rx1620 Server. The hp Integrity rx1620 Server is designed to be rack mounted.

Control Panel

The control panel of the hp Integrity rx1620 Server provides the controls and indicators commonly used for operation.

Figure 2-1 Front View

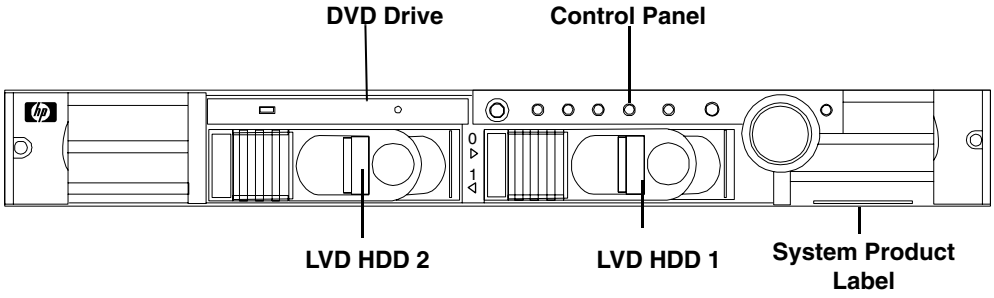


Figure 2-2 Control Panel

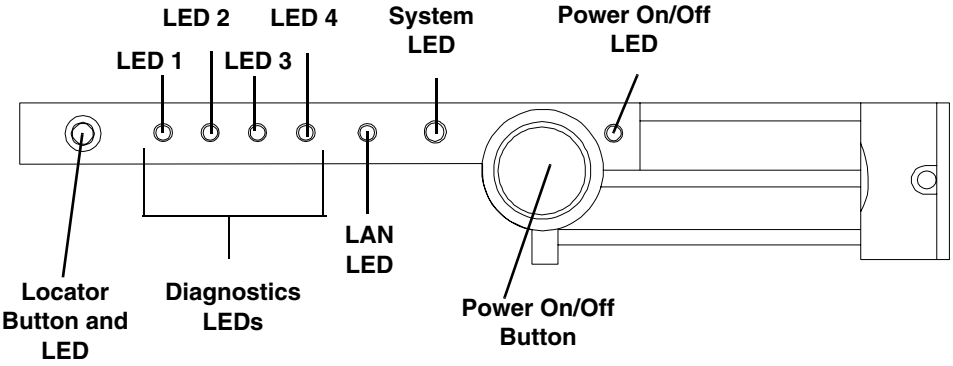


Table 2-1 Control Panel LEDs and Switches

Name	Function
Power On/Off LED	The green on/off LED is illuminated when the power is on.
Power On/Off Button	This is the power on/off switch for the server.

Table 2-1 Control Panel LEDs and Switches (Continued)

Name	Function
System LED	The System LED provides information about the system status. When the system is running code other than Operating System, the LED is flashing green. When operation is normal, the LED is green. When there is a system warning, the LED is flashing yellow. When there is a system fault, the LED is flashing red.[a]
LAN LED	The LAN LED provides status information about the LAN interface. When the LAN LED is flashing, there is activity on the LAN.
Diagnostic LED 1	The four diagnostic LEDs operate in conjunction with the system LED to provide diagnostic information about the system.[a]
Diagnostic LED 2	The four diagnostic LEDs operate in conjunction with the system LED to provide diagnostic information about the system.[a]
Diagnostic LED 3	The four diagnostic LEDs operate in conjunction with the system LED to provide diagnostic information about the system.[a]
Diagnostic LED 4	The four diagnostic LEDs operate in conjunction with the system LED to provide diagnostic information about the system.[a]
Locator Button and LED	The locator button and LED are used to help locate this server within a rack of servers. When the button is engaged, the blue LED illuminates and an additional blue LED on the rear panel of the server illuminates. This function may be remotely activated.

a. See Chapter 5, Troubleshooting, for details on information provided by the system and diagnostic LEDs.

Additional Controls and Indicators

The hp Integrity rx1620 Server can have up to two low-voltage differential (LVD), 3.5 inch form factor hard disk drives installed. These hard disk drives have LEDs that provide status and activity information.

Hard Disk Drive Indicators

The hard disk drives have two LEDs per drive, as described below.

- Activity LED—The Drive Activity LED is green and indicates disk drive activity. This LED is directly controlled by the disk drive and turns on when a drive is accessed.
- Status LED—The Drive Status LED is not used on the hp Integrity rx1620.

Figure 2-3 Hard Disk Drive LED Indicators

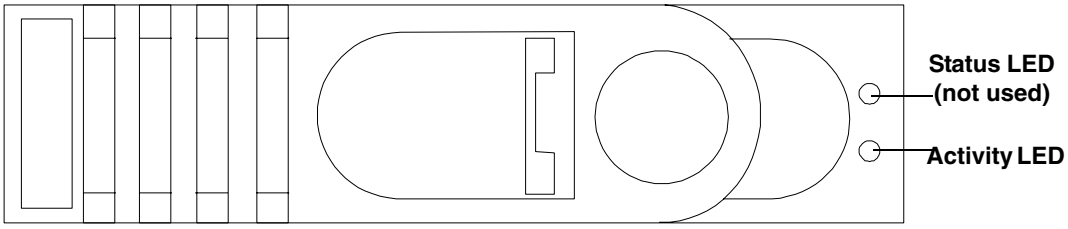


Table 2-2 Hard Disk Drive LED Definitions

LED	Activity	Description
Status LED	None	Not Used
Activity LED	Flashing green	Drive access under hard drive control

Optional Removable Media Drive

The hp Integrity rx1620 Server is delivered without a removable media drive. Either a DVD or CD-RW/DVD drive may be added. Each of these optional devices has one activity LED.

Figure 2-4 DVD

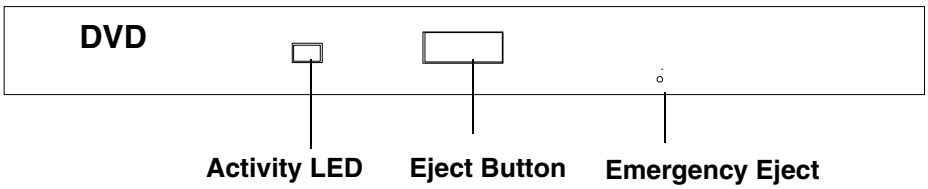


Table 2-3 DVD Drive LED Definitions

LED	Activity	Description
Activity LED	Flashing green	Drive activity

Rear Panel

The hp Integrity rx1620 Server rear panel includes communication ports, I/O ports, AC power connector, and the locator LED/button.

Figure 2-5 Rear View

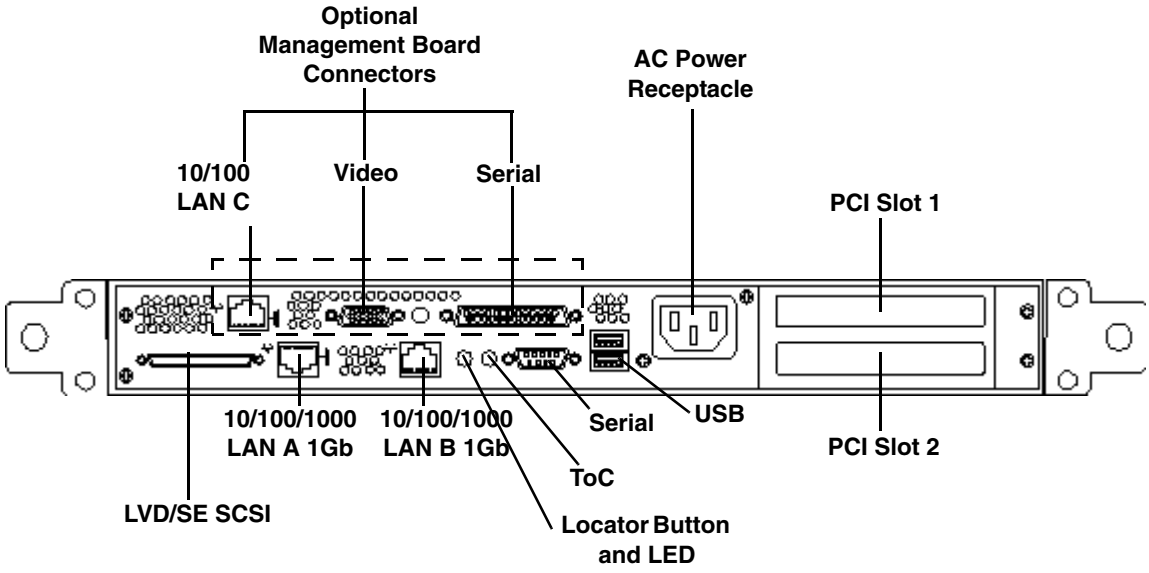


Table 2-4 Rear Panel Connectors and Switches

Connector/Switch	Function
AC Power	Primary power connection for the server
LVD/SE SCSI	68-pin, low-voltage differential, single-ended U320 SCSI. This connector provides external SCSI connection on SCSI Channel B.
10/100/1000 LAN A	10/100/1000 base-T ethernet LAN A 1Gb connector
10/100/1000 LAN B	10/100/1000 base-T ethernet LAN B 1Gb connector
Serial	9-pin male serial connector — this is the console connector if the optional management processor card is not installed.
USB	Two Universal Serial Bus (USB 2.0) connectors
ToC	Transfer of Control button. Halts all system processing and I/O activity and restarts the computer system.
Locator Button and LED	The locator button and LED are used to help locate a server within a rack of servers. When the button is engaged, the blue LED illuminates and an additional blue LED on the front panel of the server illuminates. This function may be remotely activated.
Video (optional)	15-pin female video connector for the optional management processor card

Table 2-4 Rear Panel Connectors and Switches (Continued)

Connector/Switch	Function
Serial (optional)	25-pin female serial data bus connector for the optional management processor card
10/100 LAN C (optional)	10 Mb/100 Mb LAN C connector for the optional management processor card

10/100/1000 base-T ethernet LAN A 1Gb Connector

The rear panel 10/100/1000 base-T ethernet LAN A 1Gb connector has the following status and activity LEDs.

Figure 2-6 10/100/1000 base-T ethernet LAN A 1Gb Connector LEDs

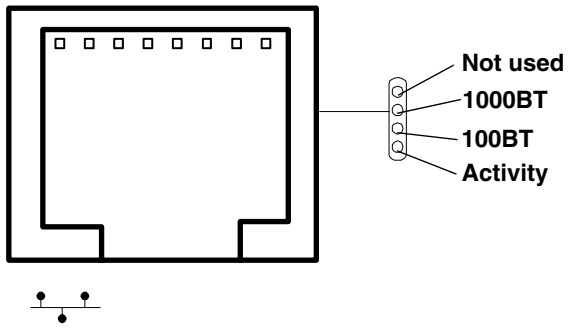


Table 2-5 10/100/1000 base-T ethernet LAN A 1Gb Connector LEDs

LAN LED	Location	Color	State
Not used	Top	None	None
1000mb	2nd from top	Amber	Blinking amber – the 1000 Mbps with ethernet protocol and twisted-pair wiring is enabled. Off – no link.
100mb	2nd from bottom	Green	Blinking green – the 100 Mbps with ethernet protocol and twisted-pair wiring is enabled. Off – no link.
Activity	Bottom	Green	Blinking green – the Activity LED lights, and all other LEDs are off for a 10 Mbps connection. Off – no activity

10/100/1000 base-T ethernet LAN B 1Gb Connector

The rear panel 10/100/1000 base-T ethernet LAN B 1Gb connector has the following status and activity LEDs.

Figure 2-7 10/100/1000 base-T ethernet LAN B 1Gb Connector LEDs

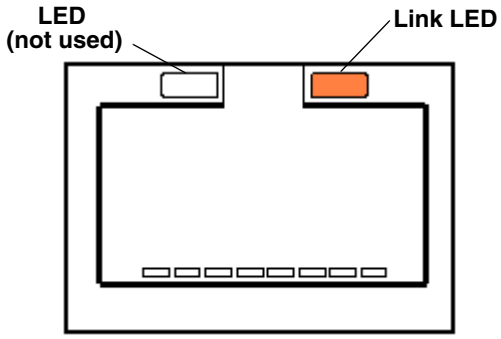


Table 2-6 10/100/1000 base-T ethernet LAN B 1Gb Connector LEDs

Link LED	Output
Activity	Blinking Orange
Link w/no activity	Solid Orange
No link	Off

Optional Management Processor Card LAN C 10/100 Connector LEDs

The optional management processor LAN C uses an RJ-45 type connector. This connector has four LEDs that signal status and activity.

Figure 2-8 Optional Management Processor Card LAN C 10/100 Connector LEDs

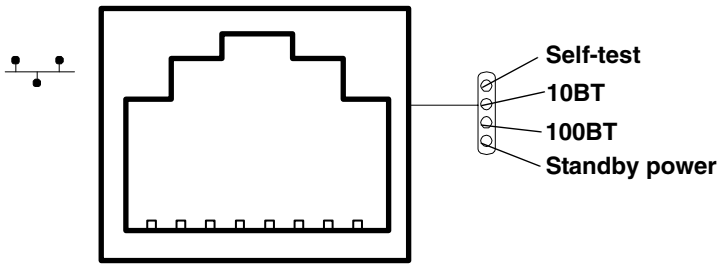


Table 2-7 Optional Management Processor Card LAN C 10/100 Connector LEDs

LAN LED	Location	Color	State
Self-test	Top	Yellow	Management processor running selftest or error
		Off	Management processor has booted
10BT	2nd from top	Green	10BT link established
		Blinking green	10BT activity
		Off	No link or 100BT link
100BT	2nd from bottom	Green	100BT link established
		Blinking green	100BT activity
		Off	No link or 10BT link
Standby Power	Bottom	Green	Standby power on
		Off	Standby power off

3 External Connectors

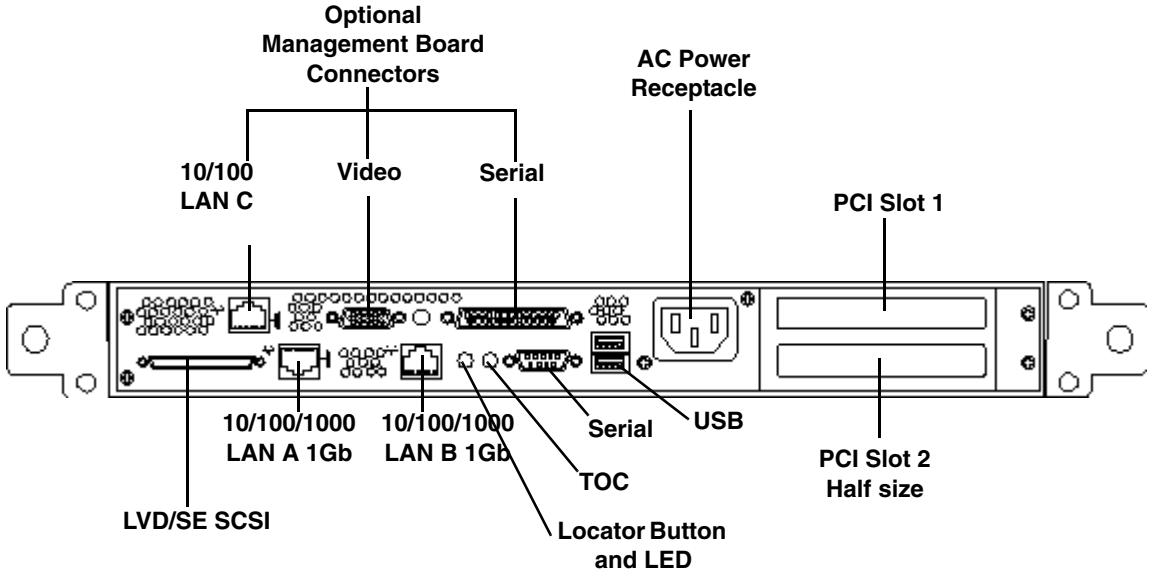
This chapter describes the external connectors provided on the hp Integrity rx1620 Server.

Connector Pinouts

The following ports and connectors are found on the rear panel of the hp Integrity rx1620 Server.

- Dual USB 2.0
- Serial
- 68-pin LVD, SE U320 SCSI
- 10/100/1000 LAN
- AC power receptacle

Figure 3-1 Rear View of Server



Universal Serial Bus (USB) Ports

Figure 3-2 Dual USB Port Connector

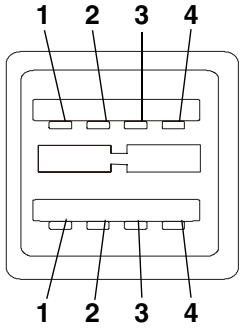


Table 3-1 USB Pinouts

Pin Number	Signal Description
1	+5VDC
2	MR
3	PR
4	Ground

Serial Port

Figure 3-3 Serial Port Connector

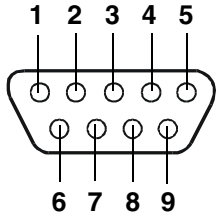


Table 3-2 Serial Port Pinouts

Pin Number	Signal Description
1	Data Carrier Detect
2	Receive Data
3	Transmit Data

Table 3-2 Serial Port Pinouts (Continued)

Pin Number	Signal Description
4	Data Term Ready
5	Ground
6	Data Set Ready
7	Request to Send
8	Clear to Send
9	Ring Indicator

SCSI Port, Ultra 3, 68-Pin

A single, Ultra 3, 68 pin SCSI connector is located at the rear panel of the server. The external connector supports SCSI channel “B.”

Figure 3-4 SCSI Port, Ultra 3, 68-Pin

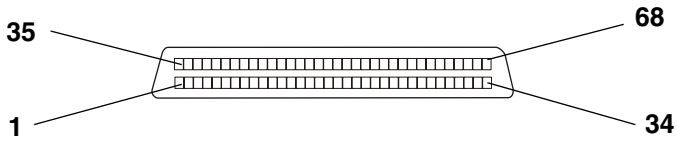


Table 3-3 SCSI Port Pinouts

Pin Number	Signal Description	Pin Number	Signal Description
1	S1 (+DB 12)	35	S35 (-DB 12)
2	S2 (+DB 13)	36	S36 (-DB 13)
3	S3 (+DB 14)	37	S37 (-DB 14)
4	S4 (+DB 15)	38	S38 (-DB 15)
5	S5 (+DB P1)	39	S39 (-DB P1)
6	S6 (+DB 0)	40	S40 (-DB 0)
7	S7 (+DB 1)	41	S41 (-DB 1)
8	S8 (+DB 2)	42	S42 (-DB 2)
9	S9 (DB 3)	43	S43 (-DB 3)

Table 3-3 SCSI Port Pinouts (Continued)

Pin Number	Signal Description	Pin Number	Signal Description
10	S10 (+DB 4)	44	S44 (-DB 4)
11	S11 (+DB5)	45	S45 (-DB 5)
12	S12 (+DB 6)	46	S46 (-DB 6)
13	S13 (+DB 7)	47	S47 (-DB 7)
14	S14 (+DB P)	48	S48 (-DB P)
15	S15	49	S49
16	S16 (DIFFSENS)	50	S50
17	S17 (TERMPWR)	51	S51 (TERMPWR)
18	S18 (TERMPWR)	52	S52 (TERMPWR)
19	S19 (RESERVED)	53	S53 (RESERVED)
20	S20	54	S54
21	S21 (+ATN)	55	S55 (-ATN)
22	S22	56	S56
23	S23 (+BSY)	57	S57 (-BSY)
24	S24 (+ACK)	58	S58 (-ACK)
25	S25 (+RST)	59	S59 (-RST)
26	S26 (+MSG)	60	S60 (-MSG)
27	S27 (+SEL)	61	S61 (-SEL)
28	S28 (+C/D)	62	S62 (-C/D)
29	S29 (+REQ)	63	S63 (-REQ)
30	S30 (+I/O)	64	S64 (-I/O)
31	S31 (+DB 8)	65	S65 (-DB 8)
32	S32 (+DB 9)	66	S66 (-DB 9)
33	S33 (DB 10)	67	S67 (-DB 10)
34	S34 (DB 11)	68	S68 (-DB 11)

LAN Connectors

The hp Integrity rx1620 Server has 3 different LAN connectors. They are:

- 10/100/1000 base-T ethernet LAN A Gb connector
- 10/100/1000 base-T ethernet LAN A Gb connector
- Optional 10/100 MP card

10/100/1000 base-T ethernet LAN A 1Gb Connector

The rear panel 10/100/1000 base-T ethernet LAN A 1Gb connector has the following status and activity LEDs.

Figure 3-5 10/100/1000 base-T ethernet LAN A 1Gb Connector LEDs

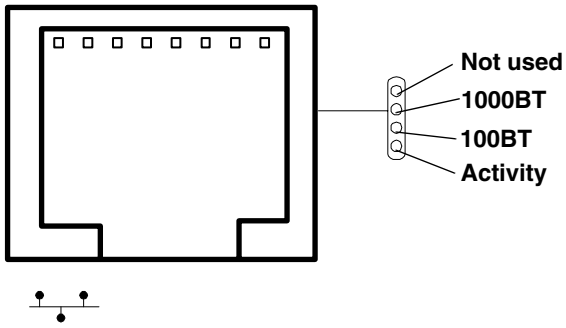


Table 3-4 1Gb LAN A Connector LEDs

LAN LED	Location	Color	State
Not used	Top	None	None
1000mb	2nd from top	Amber	Blinking amber – the 1000 Mbps with ethernet protocol and twisted-pair wiring is enabled. Off – no link.
100mb	2nd from bottom	Green	Blinking green – the 100 Mbps with ethernet protocol and twisted-pair wiring is enabled. Off – no link.
Activity	Bottom	Green	Blinking green – The Activity LED lights, and all other LEDs are off for a 10 Mbps connection. Off – no activity

10/100/1000 base-T ethernet LAN B 1Gb Connector

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Figure 3-6 10/100/1000 base-T ethernet LAN B 1Gb Connector LEDs

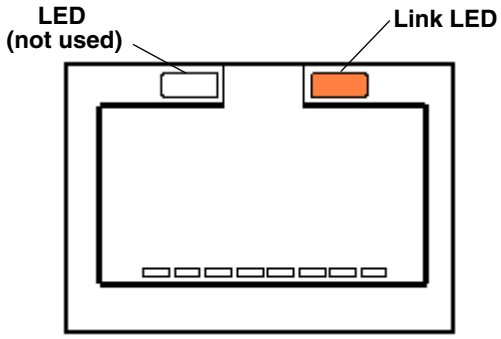


Table 3-5 10/100/1000 base-T ethernet LAN B 1Gb Connector LEDs

Link LED	Output
Activity	Blinking Orange
Link w/no activity	Solid Orange
No link	Off

Optional Management Processor Card LAN C 10/100 Connector LEDs

The optional management processor LAN C uses an RJ-45 type connector. This connector has four LEDs that signal status and activity.

Figure 3-7 Optional Management Processor Card LAN C 10/100 Connector LEDs

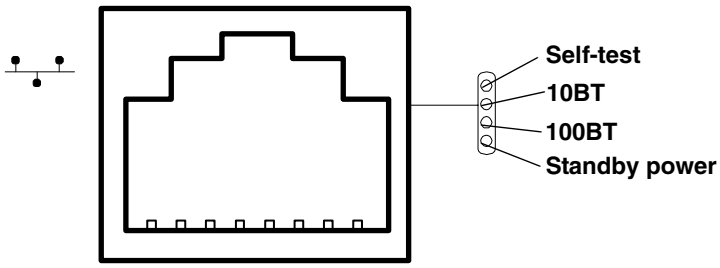


Table 3-6 Optional Management Processor Card LAN C 10/100 Connector LEDs

LAN LED	Location	Color	State
Self-test	Top	Yellow	Management processor running selftest or error
		Off	Management processor has booted
10BT	2nd from top	Green	10BT link established
		Blinking green	10BT activity
		Off	No link or 100BT link
100BT	2nd from bottom	Green	100BT link established
		Blinking green	100BT activity
		Off	No link or 10BT link
Standby Power	Bottom	Green	Standby power on
		Off	Standby power off

4 Utilities

Extensible Firmware Interface (EFI) Boot Manager

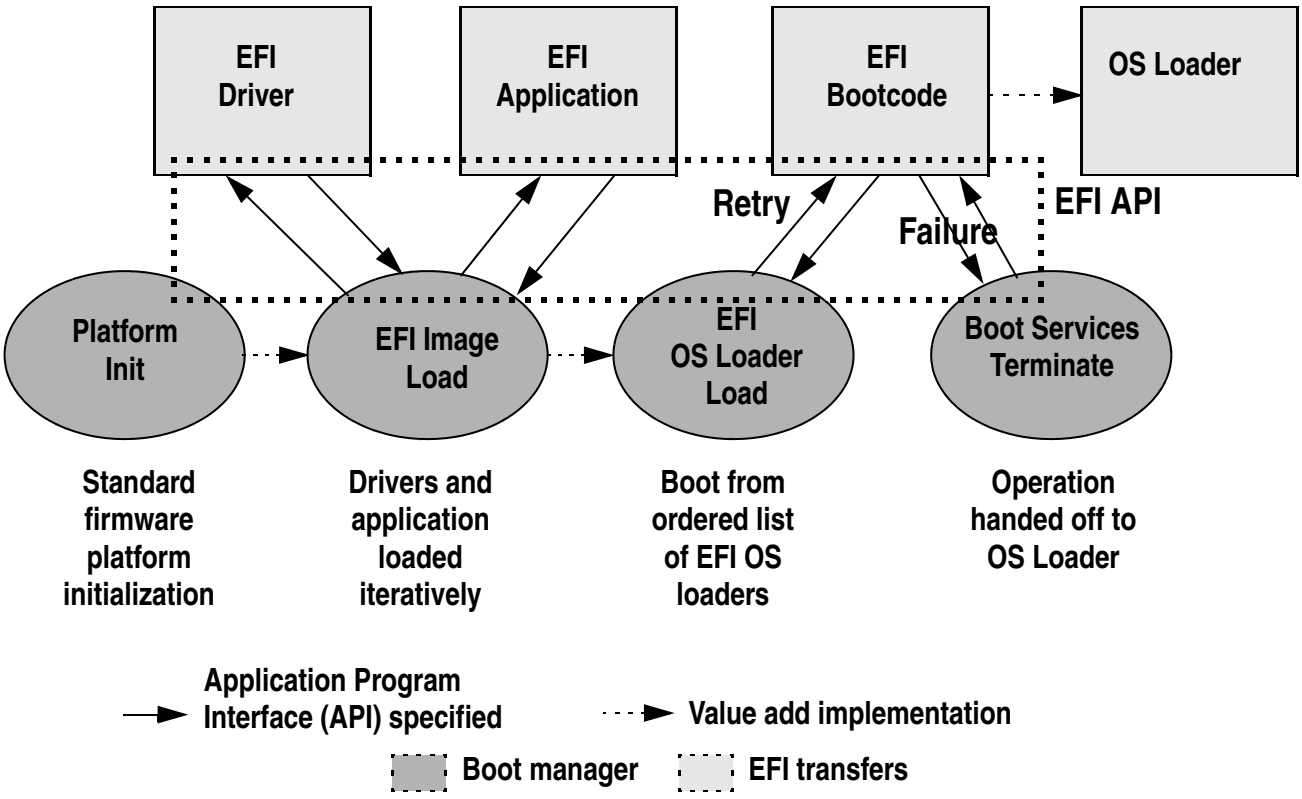
EFI (Extensible Firmware Interface) is an OS and platform-independent boot and pre-boot interface. EFI lies between the OS and platform firmware, allowing the OS to boot without having details about the underlying hardware and firmware. EFI supports boot devices, uses a flat memory model, and hides platform and firmware details from the OS.

NOTE EFI and Pre-OS System Environment (POSSE) are similar. EFI is an Intel® specification, whereas POSSE is the HP implementation that aids HP support.

EFI consolidates boot utilities similar to those found in PA-RISC based systems, such as the Boot Console Handler (BCH), and platform firmware into a single platform firmware. EFI allows the selection of any EFI OS loader from any boot medium that is supported by EFI boot services. An EFI OS loader supports multiple options on the user interface.

EFI supports booting from media that contain an EFI OS loader or an EFI-defined system partition. An EFI-defined system partition is required by EFI to boot from a block device.

Figure 4-1 EFI Boot Sequence



The EFI boot manager loads EFI applications (including operating system [OS] first stage loader) and EFI drivers from an EFI-defined file system or image loading service. Non-volatile RAM (NVRAM) variables point to the file to be loaded. These variables contain application-specific data that is passed directly to the EFI application. EFI variables provides system firmware a boot menu that points to all the operating systems, even multiple versions of the same operating systems.

The EFI boot manager allows you to control the server's booting environment. Depending on how you have configured the boot options, after the server is powered up the boot manager presents you with different ways to bring up the system. For example, you can boot to the EFI shell, to an operating system located on the network or residing on media in the server, or the Boot Maintenance menu, see "Using the Boot Option Maintenance Menu".

- *Boot from a File*—Automatically adds EFI applications as boot options or allows you to boot from a specific file. When you choose this option, the system searches for an EFI directory. If the EFI directory is found, then it looks in each of the subdirectories below EFI. In each of those subdirectories, it looks for the first file that is an executable EFI application. Each of the EFI applications that meet this criterion can be automatically added as a boot option. In addition, legacy boot options for A: and C: are also added if those devices are present. You can also launch a specific application without adding it as a boot option. In this case the EFI boot manager searches the root directories and the \EFI\TOOLS directories of all of the EFI system partitions present in the system for the specified EFI application.
- *Add a Boot Option*—Adds a boot option to the EFI boot manager. You specify the option by providing the name of the EFI application. Along with the name you can also provide either ASCII or UNICODE arguments the file might use. Given the EFI application name and any options, the EFI boot manager searches for the executable file in the same directories as described in "Boot from a File" option. When the file is found, it is executed.
- *Delete Boot Options*—Deletes a specific boot option or all boot options.
- *Change Boot Order*—Controls the relative order in which the EFI boot manager attempts boot options. For help on the control key sequences you need for this option, refer to the help menu.
- *Manage BootNext Setting*—Selects a boot option to use one time (the next boot operation).
- *Set Automatic Boot Timeout*—Defines the value in seconds that pass before the system automatically boots without user intervention. Setting this value to zero disables the timeout feature.
- *Exit*—Returns control to the EFI boot manager main menu. This displays the active boot devices, including a possible integrated shell (if the implementation is so constructed).

EFI Commands

Table 4-1 lists EFI commands for the hp Integrity rx1620 Server. The equivalent BCH commands found in PA-RISC based systems are also listed.

Table 4-1 EFI Commands

EFI Shell Command	BCH Command Equivalent (PA-RISC)	BCH Command Parameters (PA-RISC)	Definition
These commands are found in all other menus			
info boot	Boot	[PRI | HAA | ALT | <path>]	Boot from specified path
help <command>	HElp	[<menu> | <command>]	Display help for specified command or menu
reset	RESET		Reset the system (to allow reconfiguration of complex
exit (at EFI shell)	MAin		Return to the main menu
MAin			
EFI boot manager “change boot order”	PAth	[PRI | HAA | ALT | CON | KEY | <path>]	Display or modify a path
bcfg	SEArch	[ALL]	Search for boot devices
bcfg	SEArch	[DIsplay | IPL] [<path>]	Search for boot devices
many commands offer a [-b] parameter to cause 25 line breaks	ScRoll	[ON | OFF]	Display or change scrolling capability
COnfiguration			
autoboot	AUto	[BOot | SEarch | STart] [ON | OFF]	Display or set the auto start flag
info boot	BootID	[<processor #>[<bootid #>]]	Display or set processor boot identifier
EFI boot manager	Boot info		Display boot-related information
autoboot	BootTimer	[0-200]	Seconds allowed for boot attempt
cpuconfig	CPUconfig	[<proc>][ON | OFF]]	Config/deconfig processor
boottest	FastBoot	[ON | OFF] or [test] [RUN | SKIP]	Display or set boot tests execution

Table 4-1 EFI Commands (Continued)

EFI Shell Command	BCH Command Equivalent (PA-RISC)	BCH Command Parameters (PA-RISC)	Definition
date	Time	[cn:yr:mo:dy:hr:mn[:ss]]	Read or set the date
time	Time	[cn:yr:mo:dy:hr:mn[:ss]]	Read or set the real time clock
INformation			
info all	ALL		Display all system information
info boot	BootINfo		Display boot-releated information
info cpu	CAche		Display cache information
info chiprev	ChipRevisions		Display revision number of major VLSI
MP command <df>	FRU		Display FRU information
info fw	FwrVersion		Display firmware version for PDC, ICM, and complex
info io	IO		Display firmware version for PDC, ICM, and complex
lanaddress	LanAddress		Display core LAN station address
info mem	Memory		Display memory information
info cpu	PRocessor		Display processor information
SERvice			
errdump clear	CLEARPIM		Clear (zero) the contents of PIM
mm	MemRead	<addr> [<len>] [<type>]	Read memory locations scope of page deallocation
pdt	page deallocation table (pdt)		Display or clear the page deallocation table

Table 4-1 EFI Commands (Continued)

EFI Shell Command	BCH Command Equivalent (PA-RISC)	BCH Command Parameters (PA-RISC)	Definition
errdump mca errdump cmc errdump init	processor internal memory (PIM)	[<proc>] [HPMC | LPMC | TOC | ASIC]]	Display PIM information

EFI/POSSE Commands

This section describes the EFI/POSSE commands developed for the server.

NOTE EFI and Pre-OS System Environment (POSSE) are similar. EFI is an Intel specification, whereas POSSE is the HP implementation that aids HP support.

help

Provides information on the EFI shell commands. It also has an additional feature to aid those familiar with the BCH menus to adjust to their equivalent functions in EFI.

Syntax

```
help [-b] <category>
help [-b] <cmd>
help [-b] bch <bchmenu> <bchcmd>
```

Parameters

```
-b              Enable page breaking
category        Category of commands to view help on commands
cmd             Shell command name on which to provide verbose information
bch             Display the list of BCH commands and their corresponding EFI
bchmenu         BCH menu name taken from the top level of the BCH menu
bchcmd          BCH command on which to display information
```

Operation

If help is invoked with no parameters, it displays a list of shell command categories. To list all of the commands within a category, the user should type **`help <category>`** (see examples). If invoked with the **`-b`** switch, any output longer than one page pauses after each page is displayed. If a shell command name is used as a parameter, verbose help is displayed for that command.

If help is invoked with the **`bch`** option, it displays a list of BCH commands and their corresponding EFI/POSSE commands. It instructs the user to repeat the command line followed by a menu name for more information on that menu. If help is invoked followed by **`bch`** and a menu name, it displays a list of commands that appear under that BCH menu. The user may then invoke help followed by **`bch`**, the menu name, and a BCH command name to display information on that command. This would point the user to the command

that has taken the place of that BCH functionality, or will inform the user that the functionality no longer exists. As a shortcut, the user may enter help followed by **bch** and a BCH command name to go straight to that command.

Example 4-1 help Command

```
Shell> help
List of classes of commands:

boot          -- Booting options and disk-related commands
configuration -- Changing and retrieving system information
devices       -- Getting device, driver and handle information
memory        -- Memory related commands
shell         -- Basic shell navigation and customization
scripts       -- EFI shell-script commandsType "help" followed by a class name for a list of commands in
that class
Type "help" followed by command name for full documentation
```

Example 4-2 help bch Command

```
    COnfiguration         help bch co
    INformation           help bch in
    PAth                  help bch pa
    ScRool                help bch sr
    SEArch                help bch sea
    SERvice               help bch ser
    BOot                  help bch bo
    HElp                  help bch he
    RESET                 help bch reset
    MAin                  help bch ma

    For more help on one of the commands above, at the prompt type:
        help bch COMMAND
```

Example 4-3 help configuration Command

```
Shell> help configuration
Configuration commands:

cpuconfig  -- Deconfigure or reconfigure cpus
date       -- Display or set date
err        -- Display or set error level
esiproc    -- Make an ESI call
errdump    -- View/Clear logs
info       -- Display hardware information
monarch    -- View or set the monarch processor
palproc    -- Make a PAL call
salproc    -- Make a SAL call
time       -- Display or set time
ver        -- Displays version info

Type "help" followed by command name for full documentationon that command.
Type "help -a" to display a list of all commands.
```

Example 4-4 help cpuconfig Command

```
Shell> help cpuconfig

CPUCONFIG [cpu] [on|off]

   cpu    Specifies which cpu to configure
   on|off Specifies to configure or deconfigure a cpu
```

```
Notes:
     1. Cpu status will not change until next boot

Examples:
    * To deconfigure CPU 0
    fs0:\> cpuconfig 0 off
    CPU will be deconfigured on the next boot

    * To display configuration status of cpus
    fs0:\> cpuconfig
    <CPU configuration data displayed>
```

baud

Sets the baud rate and communication settings for a UART.

Syntax

```
baud <index> <baudrate>
```

Parameters

```
<index> 0 through the total number of UARTS minus one
<baudrate>      baud rate.
```

Operation

This command is used to change the speed for a UART in the system. This command works for all UARTs visible to EFI/POSSE. If the UART is part of processor dependent hardware (PDH) space and is initialized by the core firmware, this command communicates the settings to core firmware so the UART can be initialized with the new settings on the next boot. System default is 9600 baud.

Other Communication parameters are listed in Table 4-2.

Table 4-2 Communications Parameters

Parameter	Value
RECEIVE_FIFO_DEPTH	1
TIMEOUT	1000000
PARITY	No parity
DATA_BITS	8
STOP_BITS	1
CONTROL_MASK	0

boottest

Interacts with the speedy boot variable allowing it to be set appropriately.

Syntax

```
bootest                         Displays status of all speedy boot bits
boottest on                     Run all tests (for a normal boot time)
boottest off                    Skip all tests (for a faster boot time)
boottest [test]                 Displays status of specific Speedy Boot bit
boottest [test] [on|off]        Sets or clears a specific Speedy Boot bit
```

Parameters

```
[test]  Each test can be set or cleared:
        booting_valid   Enable/disable system firmware response to BOOTING
                        bit. If OS Speedy Boot aware set to on.
        early_cpu       Enable/disable early CPU selftests.
        late_cpu        Enable/disable late CPU selftests.
        platform        Enable/disable system board hardware tests.
        chipset         Enable/disable CEC tests.
        io_hw           Enable/disable EFI driver Core I/O tests.
        mem_init        Enable/disable memory initialization.
        mem_test        Enable/disable full destructive memory tests.
```

Example 4-5 `boottest` Command

```
Shell> boottest
   BOOTTEST Settings Default Variable
   Selftest         Setting
   -------------    -------------------------
   booting_valid    On (OS speedy boot aware)
   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
```

Example 4-6 `boottest early_cpu off` Command

```
Shell> boottest early_cpu off
   BOOTTEST Settings Default Variable
   Selftest         Setting
   -------------    -------------------------
   booting_valid    On (OS speedy boot aware)
   early_cpu        Skip 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
```

cpuconfig

Displays the config/deconfig state of processors in the system and allows the user to configure or reconfigure processors.

Syntax

```
cpuconfig <cpu> <on|off>
```

Parameters

```
<cpu>          specify a processor
<on|off>       state to set the processor to
```

Operation

Issuing cpuconfig with no parameters displays the config/deconfig status of all processors. A user can reconfigure CPUs by specifying a CPU number and a state (on or off). If a valid state is entered and is different from the current state of a CPU, its status changes on the next boot. The last remaining configured CPU in a system cannot be deconfigured.

Example 4-7 `cpuconfig` Command

```
Shell>  cpuconfig
PROCESSOR INFORMATION
       # of                  L3     L4     Family/
CPU    Logical               Cache  Cache    Model           Processor
Slot   CPUs       Speed      Size   Size    (hex.)     Rev     State
---   -------    ---------  ----   -----   ------   ----    ----------
 0         1      1 GHz     1.5 MB   None   1F/01     B1          Active
 1         1      1 GHz     1.5 MB   None   1F/01     B1          Active
```

Example 4-8 `cpuconfig 2` Command

```
Shell> cpuconfig 2 off
CPU will be deconfigured on next boot.

Shell> cpuconfig
PROCESSOR INFORMATION
       # of                  L3     L4       Family/
CPU     Logical              Cache  Cache    Model           Processor
Slot    CPUs       Speed     Size   Size    (hex.)    Rev     State
---   -------    ---------   ----   -----   ------   ----    ----------
 0       1          1 GHz    3 MB   None    1F/00    B2          Active
 1       1          1 GHz    3 MB   None    1F/00    B2    Sched Deconf
```

default

Allows the user to restore non-volatile memory (NVM) to default values and clear NVM storage values.

Syntax

```
default     [efi|sal]
default      clear [bmc|efi|sal]
```

Parameters

```
clear     clears NVM storage values
```

Operation

Default sets NVM and stable store values to predefined default values. To the normal user only a subset of values are available for default. Executing “default clear” resets the system.

errdump

Displays the contents of processor internal memory logged on the first machine check abort (MCA) for all processors present in the system.

Syntax

```
errdump [mca | cpe | cmc | init | la | clear]
```

Parameters

```
mca               dumps the Machine Check Abort error log
cpe               dumps the Corrected Platform Error log
cmc               dumps the Corrected Machine Check log
init              dumps the Initialization log
la                dumps the Logic Analyzer log
clear             erases all of the logs (mca, cpe, cmc, init, la)
```

Operation

If a user enters no parameters, the usage is displayed. Otherwise, the specified error log is displayed. Adding -n to the clear parameter disables the confirmation prompt. (The `errdump` command can also be accessed via the System Configuration menu.)

info

Allows the user to display most system information.

Syntax

```
info [ -b] [target]
```

Parameters

```
target:         valid targets are:
        all        display everything
        cpu        display information on cpus
        cache      display information on cache
        mem        display information on memory
        io         display information on io
        boot       display boot-related information
        chiprev display information on chip revisions
        fw         display firmware version information
        sys        display system information
        warning    display warning and stop boot information
```

Example 4-9 `info all` Command

```
Shell> info all

SYSTEM INFORMATION

Date/Time:  Oct 31, 2003  22:03:39  (20:03:10:31:22:03:39)

Manufacturer:  hp

Product Name:  server rx1620

Product Number:  A9901A

Serial Number:  MYJ3350026

UUID:  48B4F371-E34C-11D6-A8D6-07A8C14CB68B

System Bus Frequency:  200 MHz
```

```
PROCESSOR MODULE INFORMATION

        # of               L3      L4      Family/

   CPU  Logical            Cache   Cache   Model         Processor

   Slot CPUs     Speed     Size    Size    (hex.)   Rev  State

   ---- -------  --------  ------  ------  -------  ---  ------------

     0      1        1 GHz  1.5 MB    None   1F/01    B1        Active

     1      1        1 GHz  1.5 MB    None   1F/01    B1        Active

MEMORY INFORMATION

     ---- DIMM A -----  ---- DIMM B -----

      DIMM   Current     DIMM   Current

---  ------ ----------  ------ ----------

 0   1024MB     Active  1024MB     Active

 1    ----               ----

 2    ----               ----

 3    ----               ----

   Active Memory    : 2048 MB

   Installed Memory : 2048 MB

I/O INFORMATION

BOOTABLE DEVICES

   Order  Media Type  Path

   -----  ----------  --------------------------------------

   Seg  Bus  Dev  Fnc  Vendor  Device Slot

    #    #    #    #     ID      ID     #   Path

   ---  ---  ---  ---  ------  ------  ---  -----------

    00   00   01   00  0x1033  0x0035   XX  Acpi(HWP0002,0)/Pci(1|0)

    00   00   01   01  0x1033  0x0035   XX  Acpi(HWP0002,0)/Pci(1|1)

    00   00   01   02  0x1033  0x00E0   XX  Acpi(HWP0002,0)/Pci(1|2)

    00   00   02   00  0x1095  0x0649   XX  Acpi(HWP0002,0)/Pci(2|0)

    00   00   03   00  0x8086  0x1229   XX  Acpi(HWP0002,0)/Pci(3|0)

    00   20   01   00  0x1000  0x0030   XX  Acpi(HWP0002,100)/Pci(1|0)

    00   20   01   01  0x1000  0x0030   XX  Acpi(HWP0002,100)/Pci(1|1)

    00   20   02   00  0x14E4  0x1645   XX  Acpi(HWP0002,100)/Pci(2|0)
```

```
BOOT INFORMATION

   Monarch CPU:

   Current  Preferred

   Monarch   Monarch   Possible Warnings

   -------  ---------  -----------------

         0          0

   AutoBoot: OFF - Timeout is disabled

   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(00306E4C4F1A)  Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A))

  *Mac(00306E4C0FF2)  Acpi(HWP0002,100)/Pci(2|0)/Mac(00306E4C0FF2))

FIRMWARE INFORMATION

   Firmware Revision: 1.10 [4341]

   PAL_A Revision: 7.31/5.37

   PAL_B Revision: 5.37

   SAL Spec Revision: 3.01

   SAL_A Revision: 2.00

   SAL_B Revision: 1.10

   EFI Spec Revision: 1.10
```

```
   EFI Intel Drop Revision: 14.61

   EFI Build Revision: 1.10

   POSSE Revision: 0.10

   ACPI Revision: 7.00

   BMC Revision: 2.24

   IPMI Revision: 1.00

   SMBIOS Revision: 2.3.2a

   Management Processor Revision: E.02.25

WARNING AND STOP BOOT INFORMATION

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          0001       122e         0032

     Host Bridge          0002       122e         0032

     Host Bridge          0004       122e         0032

     Other Bridge            0          0         0002

       Other Bridge          0          0         0007

         Baseboard MC        0          0         0224
```

Example 4-10 `info cpu` Command

```
Shell> info cpu

PROCESSOR MODULE INFORMATION

         # of               L3      L4      Family/

   CPU   Logical            Cache   Cache   Model          Processor

   Slot  CPUs     Speed     Size    Size    (hex.)   Rev   State

   ----  -------  --------  ------  ------  -------  ---   ------------

     0      1        1 GHz  1.5 MB    None   1F/01    B1        Active

     1      1        1 GHz  1.5 MB    None   1F/01    B1        Active
```

Example 4-11 `info mem` Command

```
Shell> info mem

MEMORY INFORMATION

     ---- DIMM A -----  ---- DIMM B -----

      DIMM   Current     DIMM   Current

---  ------ ----------  ------ ----------

 0   1024MB     Active  1024MB     Active

 1    ----               ----

 2    ----               ----

 3    ----               ----

   Active Memory    : 2048 MB

   Installed Memory : 2048 MB
```

Example 4-12 `info io` Command

```
I/O INFORMATION

BOOTABLE DEVICES


   Order  Media Type  Path

   -----  ----------  ----------------------------------------

     1    CDROM       Acpi(HWP0002,0)/Pci(2|0)/Ata(Primary,Master)/CDROM(Entry0)


   Seg  Bus  Dev  Fnc  Vendor  Device Slot

    #    #    #    #     ID      ID     #   Path

   ---  ---  ---  ---  ------  ------  ---  -----------

    00   00   01   00  0x1033  0x0035   XX  Acpi(HWP0002,0)/Pci(1|0)

    00   00   01   01  0x1033  0x0035   XX  Acpi(HWP0002,0)/Pci(1|1)

    00   00   01   02  0x1033  0x00E0   XX  Acpi(HWP0002,0)/Pci(1|2)

    00   00   02   00  0x1095  0x0649   XX  Acpi(HWP0002,0)/Pci(2|0)

    00   00   03   00  0x8086  0x1229   XX  Acpi(HWP0002,0)/Pci(3|0)

    00   20   01   00  0x1000  0x0030   XX  Acpi(HWP0002,100)/Pci(1|0)

    00   20   01   01  0x1000  0x0030   XX  Acpi(HWP0002,100)/Pci(1|1)

    00   20   02   00  0x14E4  0x1645   XX  Acpi(HWP0002,100)/Pci(2|0)

    00   40   01   00  0x1000  0x0021   02  Acpi(HWP0002,200)/Pci(1|0)
```

```
    00   40   01   01  0x1000  0x0021   02  Acpi(HWP0002,200)/Pci(1|1)

    00   80   01   00  0x14E4  0x1645   01  Acpi(HWP0002,400)/Pci(1|0)

    00   E0   01   00  0x103C  0x1290   XX  Acpi(HWP0002,700)/Pci(1|0)

    00   E0   01   01  0x103C  0x1048   XX  Acpi(HWP0002,700)/Pci(1|1)

    00   E0   02   00  0x1002  0x5159   XX  Acpi(HWP0002,700)/Pci(2|0)
```

Example 4-13 `info boot` Command

```
Shell> info boot
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      Skip 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
```

lanaddress

Allows the user to display the core I/O MAC address.

Syntax:

```
lanaddress
```

Parameters

none

Example 4-14 `lanaddress` Command

```
LAN Address Information:

   LAN Address        Path

   -----------------  ---------------------------------------

   Mac(00306E4C4F1A)  Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A))

  *Mac(00306E4C0FF2)  Acpi(HWP0002,100)/Pci(2|0)/Mac(00306E4C0FF2))
```

monarch

Displays or modifies the ID of the bootstrap processor. The preferred monarch number is stored in NVM.

Syntax

```
monarch <cpu>
```

Parameters

```
<cpu>      specifies a cpu
```

Operation

If specified with no parameters, **monarch** displays the Monarch processor for the system. Specifying a processor number alters the preferred Monarch processor. None of these changes takes affect until after a reboot.

Example 4-15 monarch Command

```
Shell> monarch
 Current    Preferred
 Monarch     Monarch     Possible Warnings
 -------    ---------    -----------------
       0           0
       0           0

To view monarch: fs0 :\ monarch

                  | Processor
------------------+-----------
current status    |    0
next boot status  |    0

To set the monarch processor to 1: fs0 :\ monarch 1

                  | Processor
------------------+-----------
current status    |    0
next boot status  |    1
```

pdt

Displays or clears the contents of the Page Deallocation Table.

Syntax

```
pdt (clear)
```

Parameters

```
<clear>      clears the pdt
```

Operation

With no options specified, the command displays the PDT information for the system. The PDT is cleared and a reboot is required for memory reallocation and safe booting.

Example 4-16 pdt Command

```
Shell> pdt
PDT Information
                Last Clear time: PDT has not been cleared
       Number of total entries in PDT:                 50
        Number of used entries in PDT:                  0
```

```
       Number of free entries in PDT:                 50
  Number of single-bit entries in PDT:                 0
   Number of multi-bit entries in PDT:                 0
     Address of first multi-bit error:  x0000000000000000
```

Example 4-17 `pdt clear` Command

```
Shell> pdt clear
Are you sure you want to clear the PDT? [y/N] y
Shell>

Shell> pdt
PDT Information

                Last Clear time: 10/21/01  5:00p
       Number of total entries in PDT:                 50
        Number of used entries in PDT:                  0
        Number of free entries in PDT:                 50
  Number of single-bit entries in PDT:                  0
   Number of multi-bit entries in PDT:                  0
     Address of first multi-bit error: 0x0000000000000000
```

sysmode

Display or modify the system mode.

Syntax

```
sysmode <normal | admin| service>
```

Parameters

```
<normal>     sets system mode to normal

<admin>      sets system mode to admin

<service>     sets system mode to service
```

Operation

If specified alone, sysmode displays the system mode. If a mode is specified as a parameter, then the system mode is changed. This new mode takes effect immediately. The system mode is retained on successive boots. Interaction with sysmode in a variety of scenarios is outlined below.

Example 4-18 `sysmode` Command

```
Shell> sysmode
System Mode: NORMAL

Shell> sysmode admin
You are now in admin mode.

Shell> sysmode service
You are now in service mode.

Shell> sysmode normal
You are now in normal mode
```

Specifying SCSI Parameters

The following SCSI parameters may be configured for the SCSI board:

- SCSI ID (SCSI initiator ID)
- Maximum data transfer rate (SCSI rate)
- Bus width
- Whether the HBA is bootable (driver support)
- Avoid bus resets (secondary cluster server)

Using the SCSI Setup Utility

Step 1. At the EFI shell prompt, type this command to map the parameters for all PCI cards installed in the system:

`info io`

A list of all the devices that are installed in the hp Integrity rx1620 Server and managed by EFI drivers is displayed. The output may look like this:

```
 Seg  Bus  Dev  Fnc  Vendor  Device Slot
    #    #    #    #      ID      ID    #   Path
  ---  ---  ---  ---  ------  ------  ---  -----------
   00   00   01   00  0x1033  0x0035   XX  Acpi(HWP0002,0)/Pci(1|0)
   00   00   01   01  0x1033  0x0035   XX  Acpi(HWP0002,0)/Pci(1|1)
   00   00   01   02  0x1033  0x00E0   XX  Acpi(HWP0002,0)/Pci(1|2)
   00   00   02   00  0x1095  0x0649   XX  Acpi(HWP0002,0)/Pci(2|0)
   00   00   03   00  0x8086  0x1229   XX  Acpi(HWP0002,0)/Pci(3|0)
   00   20   01   00  0x1000  0x0030   XX  Acpi(HWP0002,100)/Pci(1|0)
   00   20   01   01  0x1000  0x0030   XX  Acpi(HWP0002,100)/Pci(1|1)
   00   20   02   00  0x14E4  0x1645   XX  Acpi(HWP0002,100)/Pci(2|0)
   00   40   01   00  0x1000  0x0021   02  Acpi(HWP0002,200)/Pci(1|0)
   00   40   01   01  0x1000  0x0021   02  Acpi(HWP0002,200)/Pci(1|1)
   00   80   01   00  0x14E4  0x1645   01  Acpi(HWP0002,400)/Pci(1|0)
   00   E0   01   00  0x103C  0x1290   XX  Acpi(HWP0002,700)/Pci(1|0)
   00   E0   01   01  0x103C  0x1048   XX  Acpi(HWP0002,700)/Pci(1|1)
   00   E0   02   00  0x1002  0x5159   XX  Acpi(HWP0002,700)/Pci(2|0)
```

In the example above, a single SCSI interface is shown in the listing. The information for both channels of the SCSI interface is shown in **bold**, for highlighting purposes.

For each channel of the SCSI board, you need to note certain information. As an example, look at the information for the SCSI interface (the first two bold lines). For each channel of *this* SCSI interface, note the following information:

- `Bus #`—identifies the bus the device is on; for the SCSI interface, this is the same for both channels. In this example, the bus number is `20`.
- `Dev #`—the ID the device is assigned on the bus; for the SCSI interface, this is the same for both channels. In this example, the SCSI interface is device `01`.
- `Fnc #`—identifies the channel of the device (`00` for channel A, `01` for channel B, and so on). In this example, because the SCSI interface has two channels, one channel is `00` and the other is `01`.
- `Vendor ID`—shows the device's vendor ID; for the SCSI interface, this is the same for both channels. For all the SCSI interface the ID is `0x1000`.
- `Device ID`—shows the device ID; for the SCSI interface, this is the same for both channels. For the SCSI interface the ID is `0x0030`.
- `Slot #`—identifies the physical card slot in the system where the SCSI interface is installed; for the SCSI interface, this is the same for both channels. In this example, the SCSI interface is on the system board therefore the in slot number is `xx`.
- `Path`—identifies the device's path; for the SCSI interface, this is the same for both channels. In this example, the SCSI interface path is `Acpi(HWP0002,200)/Pci(1|0)` for channel A and `Acpi(HWP0002,200)/Pci(1|1)` for channel B.

Using the SCSI interface information from the example above, the pieces of information that, combined, tell you this is a SCSI interface are the following (shown in **bold**, for highlighting purposes):

```
00   20   01   00  0x1000  0x0030   xx  Acpi(HWP0002,200)/Pci(1|0)
00   20   01   01  0x1000  0x0030   xx  Acpi(HWP0002,200)/Pci(1|1)
```

Looking at all of the above information together, the vendor (**0x1000**) and device (**0x0030**) are the IDs for a SCSI interface. Of the devices with those IDs, this device has two channels (Fnc # of **00** immediately followed by Fnc # of **01**). Also, this SCSI interface has a non-numeric (XX) slot # indicating that it is on the system board.

Step 2. Still at the EFI shell prompt, type this command to obtain the controller's handle for the SCSI interface:

```
devtree
```

A tree of all EFI-capable devices installed in the system is displayed. The output could look like this:

```
Shell> devtree


Device Tree

Ctrl[04]

Ctrl[0A] Acpi(HWP0002,0)
```

```
Ctrl[12] Usb Open Host Controller

Ctrl[13] Usb Open Host Controller

Ctrl[14] Acpi(HWP0002,0)/Pci(1|2)

Ctrl[15] PCI IDE/ATAPI Controller

Ctrl[48] DW-28E

Ctrl[83] FAT File System [FAT32] 118 MB

Ctrl[16] Acpi(HWP0002,0)/Pci(3|0)

Ctrl[49] Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A)

Ctrl[0B] Acpi(HWP0002,100)

Ctrl[17] LSI Logic Ultra320 SCSI Controller

Ctrl[18] LSI Logic Ultra320 SCSI Controller

Ctrl[19] Acpi(HWP0002,100)/Pci(2|0)

Ctrl[4B] Broadcom NetXtreme Gigabit Ethernet (BCM5701)

Ctrl[0C] Acpi(HWP0002,200)

Ctrl[0D] Acpi(HWP0002,400)

Ctrl[0E] Acpi(HWP0002,700)

Ctrl[1A] Acpi(HWP0002,700)/Pci(1|0)

Ctrl[1B] Acpi(HWP0002,700)/Pci(1|1)

Ctrl[36] 16550 Serial UART Driver

Ctrl[37] VT-100+ Serial Console

Ctrl[31] Primary Console Input Device

Ctrl[32] Primary Console Output Device

Ctrl[30] Primary Standard Error Device

Ctrl[1C] Acpi(HWP0002,700)/Pci(2|0)

Ctrl[32] Primary Console Output Device

Ctrl[30] Primary Standard Error Device

Ctrl[33] Acpi(PNP0501,0)

Ctrl[34] 16550 Serial UART Driver

Ctrl[35] VT-100+ Serial Console

Ctrl[31] Primary Console Input Device

Ctrl[32] Primary Console Output Device

Ctrl[30] Primary Standard Error Device
```

```
Ctrl[44] VenHw(904EFCF0-F0A8-11D4-B4CA-303031303833)

Ctrl[46] VenHw(D65A6B8C-71E5-4DF0-A909-F0D2992B5AA9)
```

In the above example, the SCSI interface information is shown highlighted **bold**. You can tell the information is for the SCSI interface because the path on the first line—Acpi(HWP0002,100)— is the path from the information displayed by the info io command. The next two lines are for the SCSI interface two channels, one line for each channel (they contain the SCSI interface description [LSI Logic Ultra160 SCSI Controller]). Note the value shown for Ctrl—17 and 18—at the beginning of each of those lines; this is the **controller's handle** for each channel. You need to know it for the next step.

NOTE The controller's handle values will change on every boot.

Step 3. Still at the EFI shell prompt, type this command to obtain the EFI driver's handle for the SCSI interface:

`drvcfg`

A list of all EFI-capable configurable components in the system is displayed. The output may look like this:

Shell> drvcfg

Configurable Components

Drv[3D] Ctrl[15] Lang[eng]

Drv[3F] Ctrl[19] Lang[eng]

Drv[45] Ctrl[17] Lang[eng]

Drv[45] Ctrl[18] Lang[eng]

This listing shows which driver controls which device (controller). In the above example, the SCSI interface information is shown highlighted **bold**. You can tell the information is for this SCSI interface because the values shown for Ctrl—17 and 18—are the controller's handles for the SCSI interface two channels (from the information displayed by the devtree command).

NOTE The EFI driver's handle values will change on every boot.

TIP From this command (`drvcfg`), we recommend you record these two pieces of information for *each* channel of *each* SCSI interface for parameters to be changed:

- `Drv` (the EFI driver's handle)
- `Ctrl` (the controller's handle)

Step 4. Using the information (the driver's handle [Drv] and the controller's handle [Ctrl]) from the `drvcfg` command, start the EFI SCSI Setup Utility for *one* channel of *this* SCSI interface. Still at the EFI shell prompt, type this command:

drvcfg -s *drvr_handle cntrl_handle*

where

- *drvr_handle* is the handle of the driver that controls the channel whose SCSI ID you want to display or change
- *cntrl_handle* is the handle of the controller for the channel whose SCSI ID you want to display or change

So, continuing the example for *channel A* of *this* SCSI interface, you would type:

```
drvcfg -s 45 18
```

Step 5. The EFI SCSI Setup Utility starts and its main menu is displayed, showing a list of all the EFI capable SCSI interfaces in the system.

TIP To move the cursor in the EFI SCSI Setup Utility, you can use these keys:

- Arrow keys: ↑ ↓ ← →
- Alternate keys:

  H = left

  J = down

  K = up

  L = right

  I = home

  O = end

Move the cursor to highlight the channel of the SCSI interface; press **Enter**. (To determine which channel of the interface to highlight, match the `PCI Bus`, `PCI Dev`, and `PCI Func` values on this screen to the `Bus #`, `Dev #`, and `Fnc #` values from the `info io` command.)

CAUTION Do *not* select the `<Global Properties>` option on the main menu.

Step 6. The "Adapter Properties" screen for this channel of the SCSI interface is displayed. If you like, you can make sure the utility is running for the channel of the SCSI interface by comparing the values shown for `PCI Bus`, `PCI Device`, and `PCI Function` to the `Bus #`, `Dev #`, and `Fnc #` values from the `info io` command.

CAUTION Do *not* change the value for *any* of these fields on the "Adapter Properties" screen:

- `Auto Termination`
- `SCSI Parity`
- `SCSI Bus Scan Order`
- `Spinup Delay (Secs)`

Changing any of these fields can cause unpredictable results.

CAUTION Do *not* change the value for *any* of these fields on the "Device Properties" screen:

- `Scan Id`
- `Scan LUNs > 0`
- `Disconnect`
- `SCSI Timeout`
- `Queue Tags`

- `Format`
- `Verify`

Changing any of these fields can cause unpredictable results.

Step 7. You may display (and optionally change) any SCSI parameters listed below for the channel of the SCSI interface, or restore its SCSI parameters to their default values.

- SCSI ID
- Maximum data transfer rate
- Bus width
- Whether the SCSI interface is bootable (driver support)
- Avoid bus resets (secondary cluster server)
- Restore Defaults

Step 8. Use the arrow keys to navigate to the appropriate SCSI parameter.

Step 9. Use the plus (**+**) and minus (**-**) keys to scroll through the values until the value you want is displayed.

Step 10. Press **Esc** to exit the "Adapter Properties" screen. You are given these choices:

- Cancel the exit from the screen (to stay in the "Adapter Properties" screen for the channel of the SCSI interface)
- Save the changes you made and then exit the screen
- Discard the changes you made and then exit the screen

Step 11. Move the cursor to the action (cancel, save, or discard) you want to take; press **Enter**.

If you selected cancel, you remain in the "Adapter Properties" screen for the channel of the SCSI interface. You can still change the channel's parameters listed above.

If you selected save or discard, you are placed in the EFI SCSI Setup Utility's main menu.

CAUTION Do *not* select the `<Global Properties>` option on the main menu.

Step 12. Press **Esc** to exit the main menu and the EFI SCSI Setup Utility.

Step 13. Select the option for exiting the utility.

Step 14. When you are prompted to, press **Enter** to stop the SCSI interface; you are now back at the EFI shell prompt.

Step 15. At the EFI shell prompt, type this command:

```
reset
```

The system starts to reboot. This is **required** to cause the new SCSI setting.

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 hp Integrity rx1620 Server are represented by paths in the EFI shell. To identify the correct socket or disk drive, use the following tables.

Table 4-3 hp Integrity rx1620 Server Sockets

Socket	Path
1 PCI	Acpi(HWP0002,400)/pci(0|0)
2 PCI	Acpi(HWP0003,400)/pci(0|0)

Table 4-4 hp Integrity rx1620 Server Drives

Drive	Path
SCSI Disk	Acpi(HWP0002,100)/Pci(1|0)/Scsi(Pun0,Lun0)
SCSI Disk	Acpi(HWP0002,100)/Pci(1|1)/Scsi(Pun0,Lun1)
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 server or workstation 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(HWP0002,0)/Pci(2|0)/Ata(Primary,Master)/CDROM

    CD_FORMAT [Acpi(HWP0002,0)/Pci(2|0)/Ata(Secondary,Master)/CDROM

    Removable Media Boot [Acpi(HWP0002,500)/Pci(2|0)/Ata(Secondary,Master)

    Load File [EFI Shell [Built-in]]

    Load File [Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A)]

    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(HWP0002,0)/Pci(2|0)/Ata(Primary,Master)/CDROM

    Removable Media Boot [Acpi(HWP0002,0)/Pci(2|0)/Ata(Secondary,Master)

    Load File [EFI Shell [Built-in]]

    Load File [Acpi(HWP0002,0)/Pci(3|0)/Mac(00306E4C4F1A)]

    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)
```

* indicates a currently selected device.

This menu is identical to Console Error Devices. The hp Integrity rx1620 Server 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.

Table 4-5 Console Output Devices

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)

- 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, and so on) can be selected for each serial console, but multiple serial consoles can be selected at a time.

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(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)
```

* indicates a currently selected device.

- 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 (PcAnsi, Vt100, and so on) can be selected for each serial console, but multiple serial consoles can be selected at a time.

Table 4-6 Console Input Devices

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+)

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 hp Integrity rx1620 Server 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:

Resetting Passwords

If you forget your passwords, they can be reset using an MP command. Follow theses steps.

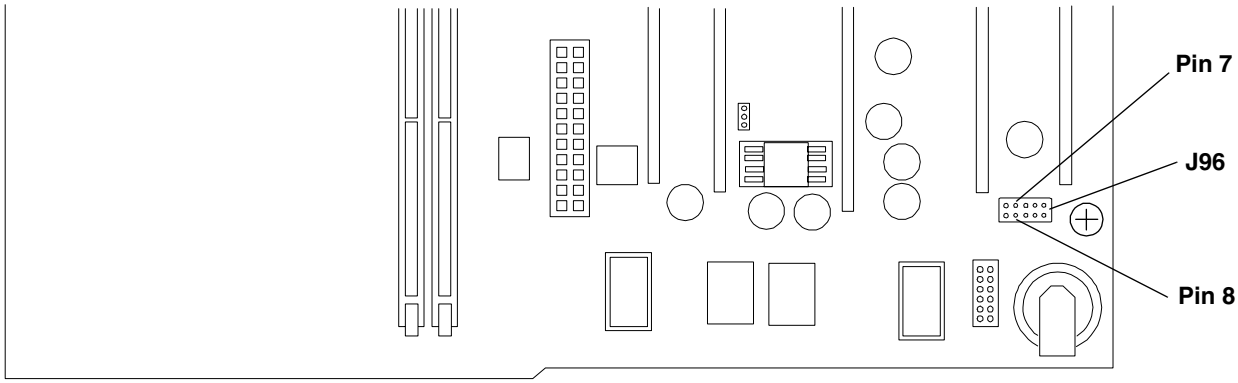
- If your system has an MP card:

  Run the MP card bp command to reset the administrator and user passwords (see “Management Processor Command Interface”).
- If your system does not have an MP card, you must reset the passwords using a jumper on the system board:

Step 1. Power down the system and unplug the AC power cord.

Step 2. Place a jumper between pins 7 and 8 on J96 located on the system board near the battery.

Figure 4-2 Password Reset Jumper



Step 3. 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.

Step 4. Unplug the AC power cord again and remove the jumper.

Step 5. Plug in the power cord and boot the system.

Step 6. The passwords have been cleared. Follow the instructions above to set new system passwords.

Step 7. Store the system in a secure location and keep the system case locked at all times to protect against unauthorized access.

Management Processor

The management processor is an independent support system for the server. It provides a way for you to connect to a server and perform administration or monitoring tasks for the server hardware.

The management processor controls power, reset, Transfer of Control (TOC) capabilities, provides console access, displays and records system events, and can display detailed information about the various internal subsystems. The management processor also provides a virtual front panel that can be used to monitor system status and the state of front panel LEDs. All MP functions are available via the LAN, local RS-232 and remote RS-232 ports.

The management processor is available whenever the system is connected to a power source, even if the server main power switch is in the off position.

Access to the management processor can be restricted by user accounts. User accounts are password protected and provide a specific level of access to the server and management processor commands.

Multiple users can interact with the management processor. From the MP Main Menu users can select any of the following options: enter management processor command mode, enter console, view event logs, view console history, display virtual front panel, enter console session, or connect to another management

processor. Multiple users can select different options from the MP Main Menu at the same time. However, management processor command mode and console mode are mirrored, The MP allows only one user at a time to have write access to the shared console.

Accessing the Management Processor

You can connect to the management processor using the following methods:

- The **local RS-232C port** using a local terminal
- The **remote RS-232C port** using external modem (dial-up) access, if remote modem access is configured
- The **management processor LAN port** using Web Console or telnet if login access through the management processor LAN is enabled

Interacting with the Management Processor

To interact with the management processor, perform the following steps:

Step 1. Log in using your management processor user account name and password.

NOTE	If the management processor is not displaying the MP Main Menu, use **CTRL+B** to access the MP Main Menu and the management processor (MP) prompt.

Step 2. Use the management processor menus and commands as needed. A list of available commands can be displayed by using the management processor help function (in the MP Main Menu, enter **HE** followed by **LI** at the MP HELP: prompt). Log out using the X command (in the MP Main Menu, enter **X** at the MP> prompt) when done.

Management Processor Command Interface

Use the management processor menus and commands as needed. The login screen, which includes the Main Menu, is shown below. Main Menu commands (CO, VFP, CM, CL, CSP, SE, SL, HE, and X) can be entered after the MP prompt. Commands not displayed in the MP Main Menu can be accessed in command mode by first using the CM command at the MP prompt. (A list of available commands can be displayed by using the management processor help function. Display the list of commands as follows: in the MP Main Menu, enter **HE** after the MP> prompt, then enter **LI** after the MP HELP: prompt.) You can return to the MP Main Menu by typing **CTRL+B**.

NOTE At publication, the current version of the Management Processor Revision is E.02.25. Check the HP website for the latest revision.

MP Welcome Screen

MP Welcome screen commands:

```
MP Login: Admin
MP password: *****
Hewlett-Packard Management Processor
(C) Copyright Hewlett-Packard Company 1999-2003. All rights reserved
System Name: xxxxxxxxx


MP MAIN MENU:
CO:Console
VFP:Virtual Front Panel
CM:Command Menu
CL:Console Log
SL:Show Event Logs
CSP:Connect to Service Processor
SE:Create OS Session
HE:Main Menu Help
X:Exit Connecion
```

Management Processor Help System

The MP has a robust help system. To invoke MP HELP, enter **he** after the MP> prompt. The following is displayed:

```
HE

==== MP Help: Main Menu ============================================(Administrator)===

Hardware Revision a1 Firmware Revision E.02.20 May 30 2003,15:18:47

                        MP Help System

    Use Ctrl-B to exit MP command interface and return to the main MP menu:

    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
```

Enter one of the commands described above: **OV, LI, <command>, TOP, HE, Q**

Management Processor Commands

MP commands are listed in the following table and described in the following paragraphs.

Table 4-7 Management Processor Commands and Descriptions

Command	Description
BP	Reset BMC passwords
CA	Configure asynch/serial ports
CG	Certificate generator
CL	View console log
CM	Select command mode
Ctrl+B	Return to MP main menu
CO	Select console mode
CSP	Connect to service processor
DATE	Date display
DC	Default configuration
DF	Display FRU information
DI	Disconnect remote or LAN console
FW (XU)	Upgrade MP firmware
HE	Display help for menu or command
ID	System information
IT	Inactivity timeout settings
LC	LAN configuration
LOC	Locator LED display and configuration
LS	LAN Status
MA	Return to Main Menu
MR	Modem reset
MS	Modem status
PC	Remote power control
PG	Paging parameter setup

Table 4-7 Management Processor Commands and Descriptions (Continued)

Command	Description
PR	Power restore
PS	Power management module status
RB	Reset BMC
RS	Reset system through RST signal
SA	Set access
SE	Enter OS session (UNIX only)
SL	Show event logs
SO	Security options
SS	System processor status
SYSREV	Current system firmware revisions
TC	Reset via transfer of control (TOC)
TE	Tell- send a message to other users
UC	User configuration
VFP	Virtual front panel
WHO	Display connected management processor users
X	Exit management processor and disconnect
XD	Diagnostics and/or reset of management processor

Reset BMC Passwords

BP: Reset BMC Passwords

This command resets BMC passwords (both USER and ADMIN passwords).

Configure Serial Port Parameters

CA: Configure local and remote serial port parameters

Set up the local serial port parameters as follows:

- TERMINAL TYPE: Vt100 vs HPterm
- BAUD RATES: Input and output data rates are the same; 300, 1200, 2400, 4800, 9600, 38400, 115200 bit/sec.
- FLOW CONTROL: Hardware uses RTS/CTS; Software uses Xon/Xoff.
- TRANSMIT CONFIGURATION STRINGS: Disable this setting whenever the modem being used is not compatible with the supported modem (MT5634ZBA).

IMPORTANT Do not mix HP and vt100 terminal types at the same time.

Set up the remote serial port parameters as follows:

- MODEM PROTOCOL: Bell or CCITT (CCITT is a European standard; RTS/CTS signaling is used, as well as the Ring signal. Bell is a U.S. or simple mode).
- BAUD RATES: Input and output data rates are the same; 300, 1200, 2400, 4800, 9600, 38400, 115200 bit/sec.
- FLOW CONTROL: Hardware uses RTS/CTS; Software uses Xon/Xoff.
- TRANSMIT CONFIGURATION STRINGS: Disable this setting whenever the modem being used is not compatible with the supported modem (MT5634ZBA).
- 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 mode “not always connected,” no dial-out functions are allowed: DIAL-BACK is disabled, and PAGING is not possible.

The MP mirrors the system console to the MP local, remote/modem, and LAN ports. One console output stream is reflected to all of the connected console users. If several different terminal types are used simultaneously by the users, some users may see strange results.

Example 4-19 HP-UX

Applications that care about the terminal type (install, SAM, vi, and so on) running on HP-UX use three methods to determine the terminal type:

1. The application takes the terminal information from the OS. This value is set in the CA command and takes effect for all MP ports.
2. The $TERM shell environment variable.
3. The application directly queries the terminal (in this case, the write enabled terminal establishes the terminal type).

Make sure that settings #1 and #2 agree with your terminal type.

Certificate Generate

CG: Generate RSA key pair or Self Signed Certificate

This command generates a new RSA key pair and self signed certificate.

Console Log

CL: Console Log—view the history of the Console output

This command displays up to 60 Kilobytes of logged console data (about 60 pages of display in text mode) sent from the system to the Console path.

Command Mode

CM: Command Mode—enter command mode

This command switches the console terminal from the MP Main Menu to mirrored command interface mode. If the current mux authority is administrator and the new login is as an operator, the command mux will be denied (remains in MP Main Menu mode). If a command is in progress, a message will be displayed warning the new user of system status.

Console

CO: COnsole—leave command mode and enter console mode

This command switches the console terminal from the MP Main Menu to mirrored/redirected console mode. All mirrored data is displayed. Type **CTRL+B** to return to the MP command interface.

For VT100 and HPTERM, verify that the MP setting in the CA command is correct and all mirrored consoles are of the same terminal type for proper operation.

Connect to Service Processor

CSP: Connect to remote management processor over the LAN

This command allows the local or remote port user to connect over the MP LAN to another MP on the network. The user that launches the command is given a private connection to the other MP over the LAN. To return to the original MP, type **CTRL+]** to disconnect the CSP session.

Date

DATE: Displays the current date, as generated in the MP real-time clock.

Default Configuration

DC: Default Configuration—reset all MP parameters to the default configuration

This command sets all MP parameters back to their default values. The user may reset all or a subset of the following parameters:

- IP configurations
- Modem configuration
- Paging configuration
- Command Interface configuration
- Disable remote access, security configuration
- Session configuration. For example: setting the security configuration to default erases all users and passwords.

There are three ways to reset passwords in the MP:

1. In the SO command, change individual users.
2. In the DC command choose “Reset Security Configuration”.
3. Forgotten passwords can be reset by pressing the MP reset button on the back panel of your HP Server. After the MP reboots, the local console terminal displays a message for five seconds. Responding to this message in time will allow a local user to reset the passwords.

NOTE All user information (logins, passwords, and so on) is erased in methods 2 and 3.

Display FRUID

DF: Display FRUID information

This command displays FRUID information from the BMC for FRU devices. Information provided includes serial number; part number; model designation; name and version number; and manufacturer.

Disconnect Remote or LAN Console

DI: DIsconnect remote/modem or LAN/WEB console

This command disconnects (hang up) the remote/modem or LAN/WEB users from MP. It does not disable the ports. The remote console is no longer mirrored.

MP Firmware Update

FW: Activates MP firmware upgrade mode

This command is available from either the LAN or local serial port. This command activates firmware upgrade mode, which loads new firmware through the MP LAN by FTP (which must be operational). An MP Reset is generated after the upgrade is complete.

Help

HE: Display help for menu or command

This command displays the MP hardware and firmware version identity, and the date and time of firmware generation. If executed from the MP Main Menu, general information about the MP, and those commands displayed in the MP Main Menu, will be displayed. If executed in command mode, this command displays a list of command interface commands available to the user. It also displays detailed help information in response to a topic or command at the help prompt.

Display System ID

ID: Display/modify system information

This command allows the user to display and modify the following:

- SNMP contact information
- SNMP server information
- SPU hostname

Inactivity Timeout

IT: Inactivity Timeout settings

The session inactivity timeout is up to 1,440 minutes—default is 60 minutes. This timeout prevents sessions to the system from being inadvertently left open. A session can be started by the SE command. An open session can prevent users from logging onto the MP through a port and can also prevent system applications from initiating an outbound connection.

MP inactivity timeout is up to 1,440 minutes—default is 5 minutes. This timeout prevents a user from inadvertently keeping the MP locked in a MP Command Interface mode preventing other users from looking at the console output. The MP Command Interface inactivity. timeout may not be deactivated.

Flow control timeout is 0 to 60 minutes. If set to 0, no timeout is applied. This timeout prevents mirrored flow control from blocking other ports when inactive.

Configure LAN Console

LC: LAN configuration (IP address, and so on)

This command displays and allows modification of the LAN configuration. Configurable parameters include:

- MP IP Address
- MP Host Name
- Subnet Mask
- Gateway Address
- Web Console port number
- Link State

The MP Host Name set in this command is displayed at the MP command interface prompt. Typically the DNS name for the LAN IP is entered.

This field can be programmed to any useful name or phrase. For clarity, it is useful to enter **MP-on-SYSTEM** as the MP Host name, so both names show up in the prompt (limit 19 characters, no spaces allowed.) The web access port number is also set by this command.

Locator LED Status

LOC: Locator LED Status

This command displays the current status of the Locator LED.

LAN Status

LS: LAN Status

This command displays all parameters and the current status of the MP LAN connections. The LAN parameters are not modified by the execution of this command.

Return to Main Menu

MA: Return to MP Main Menu

This command makes the MP return to the non mirrored MP Main Menu. This is the same as executing CTRL+B.

Modem Reset

MR: Modem Reset

This command makes the MP send an AT Z command to the modem, which resets it. Any modem connections are lost. The initialization results can be viewed via the MS command.

Modem Status

MS: Modem Status—Display modem status

The MS command displays the state of the modem lines connected to the remote/modem serial port. The display can be updated by pressing **Enter**. The current state of the status signals DCD, CTS, DSR, RI and the last state of the control signals DTR, RTS set by the firmware are displayed.

Power Control

PC: Power Control—turn system power on and off

For proper system shutdown, shutdown the OS before issuing this command or use the commands graceful shutdown option.

This command allows you to switch the system power on or off. the user can have the action take place immediately or after a specified delay.

Notice this is roughly the equivalent to turning the system power off at the front panel switch. There is no signal sent to the OS to bring the software down before power is turned off. To turn the system off properly. you must ensure that the OS is in the proper shutdown state before issuing this command. Use the proper OS commands or use the graceful shutdown option of the Remote Power Control command.

Configure Paging

PG: Paging parameter setup—configures pagers

This command allows the user to configure the pagers and set triggering events.

A string description of the triggering event will be sent with the page.

Power Status

PS: Power status—display the status of the power management module

This command displays on the console the status of the power management module.

Reset BMC

RB: Reset BMC

This command resets the BMC by toggling a GPIO pin.

Reset System

RS: Reset system through RST signal

IMPORTANT Under normal operation, shut down the OS before issuing this command.

This command causes the system (except the MP) to be reset through the RST signal.

Execution of this command irrecoverably halts all system processing and I/O activity and restarts the computer system. The effect of this command is very similar to cycling the system power. The OS is not notified, no dump is taken on the way down, and so on.

Set Access

SA: Set access options—configures access for LAN and remote/modem ports

This command will disconnect modem, LAN, and web users if access is disabled.

Create Local Session

SE: Log into the system on local or remote port

Only valid from the local or remote/modem port, SE allows the user to leave the MP Command Interface and enter a system session. Other mirrored MP users are placed in console mode. The session user returns to the mirrored MP session on exit.

The MP regularly checks the activity of the session, closes the connection with the system, and, if the timeout period has elapsed, returns the port to mirroring. The timeout period is set with the IT command. On HP-UX, the SE command works on the local and remote ports.

In HP-UX, use the System Administration Manager (SAM) to add modem device files for the session UARTS. The modem type, CCITT or Bell must agree with the remote port settings for the remote session port and always be Bell mode for the local session port.

If the system and the MP Command Interface local or remote ports have been configured with different port speeds, the baud rate changes to the rate specified by the OS for the duration of the session.

Display Logs

SL: Display contents of the system status logs

This command displays the contents of the event logs that have been stored in nonvolatile memory.

- System Event Log (SEL)—Events (filtered by alert level) and errors
- Forward progress—All events
- Current boot log—All events between “start of boot” and “boot complete”
- Previous boot log—The events from the previous boot

Reading the system event log turns off the system LED. Accessing this log is the only way to turn off the system LED when it is flashing and alerts have not been acknowledged at the alert display level.

Events are encoded data that provide system information to the user. Some well-known names for similar data would be Chassis Codes or Post Codes. Events are produced by intelligent hardware modules, the OS, and system firmware. Use SL to view the event log.

Navigate within the logs as follows:

- + — View the next block (forward in time)
- - — View the previous block (backward in time)
- Enter (<CR>) — View the next block in the previously selected direction (forward or backward in time)
- D — Dump the entire log for capture or analysis
- F — First entry
- L — Last entry
- J — Jump to entry number __
- V — View mode configuration (text, keyword, hex)
- ? — Display this help menu
- Q — Quit

Table 4-8 defines alert (or severity) levels.

Table 4-8 Alert Levels

Severity	Definition
0	Minor forward progress
1	Major forward progress
2	Informational
3	Warning
5	Critical
7	Fatal

Security Options

SO: Configure security options and access control (users, passwords, and so on)

This command modifies the security parameters of the MP, which include login time-outs and allowed password faults.

If configured, when you access the MP via the modem port, the MP hangs up and dials the user back. This does not work if `Modem Presence` is set to `not always connected` with the `CA` command.

If the mode is Single, the State is changed to `disabled` after the first login.

A disabled user's login is not accepted.

System Status

SS: Displays the status of the system processors

The `SS` command displays the status of the system processors and which processor is the monarch.

Firmware Revision Status

SYSREV: Displays the revision status of firmware in the system.

This command displays the revision status of firmware in the system.

NOTE At the time of production of this guide, the firmware revisions were:

```
FIRMWARE INFORMATION

   Firmware Revision: 1.10 [4341]

   PAL_A Revision: 7.31/5.37

   PAL_B Revision: 5.37

   SAL Spec Revision: 3.01

   SAL_A Revision: 2.00

   SAL_B Revision: 1.10
```

```
EFI Spec Revision: 1.10

EFI Intel Drop Revision: 14.61

EFI Build Revision: 1.10

POSSE Revision: 0.10

ACPI Revision: 7.00

BMC Revision: 2.24

IPMI Revision: 1.00

SMBIOS Revision: 2.3.2a

Management Processor Revision: E.02.25
```

Transfer Of Control

TC: System reset through INIT or TOC (Transfer of Control) signal

Under normal operation, shut down the OS before issuing this command.

This command causes the system to be reset through the INIT (or TOC) signal. Execution of this command irrecoverably halts all system processing and I/O activity and restarts the computer system. It is different from the RS command in that the processors are signaled to dump state on the way down.

Tell

TE: TEll—sends a message to other terminals

Up to 80 characters can be typed in. The message is broadcast to the other mirrored clients. Users in a session or CSP are not shown the message.

User Configuration

UC: User Configuration—controls user access

This command allows an administrator to add, modify, re-enable, or delete user logins. The administrator can also enable or disable security warnings and change passwords.

Virtual Front Panel

VFP: Display Virtual Front Panel

The VFP command presents a summary of the system by using direct console addressing. If the terminal is not recognized by the MP, VFP mode will be rejected. Each individual user will get this summary in order to avoid issues related to terminal type and screen display mode.

Who

WHO: Displays a list of MP connected users

This command displays the login name and operating mode (Main Menu, command, and so on) of the connected console client users, and the port on which they are connected. For the LAN and WEB console clients the remote IP address is also displayed.

If the local console client user did not originate the MP command interface session, there is always one default user listed for the local serial port: local user i. If the local console operator types **CTRL+B**, then the login name that the local operator used is displayed instead.

Exit from MP

X: Exit from MP command interface and disconnect from the system

This command disconnects the executing user from the system. This command is available from the local port.

Diagnostics

XD: Diagnostics and/or Reset of MP

This command allows the user to perform some simple checks to confirm the MP's health and its connectivity status. The following tests are available:

- MP Parameter Checksum
- Verify I2C connection (get BMC Device ID)
- LAN connectivity test using `ping`
- Modem self-tests

Also, the MP can be reset from this command. A MP reset can be safely performed without affecting the operation of the server.

5 Troubleshooting

This chapter provides troubleshooting instructions used in the maintenance of the hp Integrity rx1620 Server.

Troubleshooting Tips

WARNING **Before removing a cover, always disconnect the AC power cord and unplug cables. Disconnect the AC power cord to avoid exposure to high energy levels that may cause burns when parts are short-circuited by metal objects such as tools or jewelry.**

CAUTION Do not operate the HP Server for more than 5 minutes with any cover (including disk drives) removed. Damage to system components may result due to improper cooling airflow.

- For problems with an optional disk array controller board, refer to the appropriate manuals provided with the array controller.
- For questions on the operation of HP e-DiagTools, refer to the HP e-DiagTools Administrator Guide on the HP Web Site at http://docs.hp.com.
- For general information on HP Server products, refer to the HP Web Site and search for “management” at http://docs.hp.com.

Troubleshooting Methodology

Step 1. This is the entry point to the troubleshooting process. Here, you pick from a set of symptoms, ranging from very simple (System LED is blinking) to the most difficult Machine Check Abort (MCA) has occurred. The following is a list of symptom examples:

- System LED blinking
- System Alert present on console
- System will not power-up
- System will not boot
- Error/Event Message received
- Machine Check Abort (MCA) occurred

Step 2. This step narrows down the observed problem to the specific troubleshooting procedure required. Here, you isolate the failure to a specific part of the server so that you can perform more detailed troubleshooting. For example:

- Problem-System LED blinking
  - — System Alert on console?

— Analyze the alert by using the system event log (SEL) to identify the last error logged by the baseboard management controller. Use either the EFI shell command line interface (CLI) or if the optional management processor card is installed, use the MP commands to view the SEL.

Step 3. At this point you will have a good idea about which area of the system requires further analysis. For example, if the symptom was “system will not power-up” then the initial troubleshooting procedure may have indicated a problem with the DC power supply not coming up after the power switch was turned on.

Step 4. You have now reached the point where the failed Field Replaceable Unit (FRU or FRUs) have been identified and need to be replaced. You must now perform the specific remove and replace and verification steps.

NOTE If multiple FRUs are identified as part of the solution, a fix cannot be guaranteed unless all identified failed FRUs are replaced.

Step 5. There may be specific recovery procedures you need to perform to finish the repair. For example, if the display panel is replaced, you will need to restore customer specific information.

Possible Problems

This section contains example HP Server problems and their possible solutions.

The system will not power-up.

Step 1. Review the installation procedures for the server. Refer to the *hp Integrity rx1620 Installation Guide*.

Step 2. Check all power connection cables.

Step 3. Verify that power is available at the AC power receptacle. Check the receptacle output with another device.

Step 4. Check the power supply fans to see if they are operating. The fans will operate off of the dc voltage generated by the power supply.

Step 5. Check that the STBY (power good) LED located near the SCSI connector on the system board is illuminated.

Step 6. Check all connections from the power supply to the power distribution module.

Step 7. Verify that all cables and modules are correctly connected. Especially check the display panel connection.

Step 8. If the system starts to power on and then power off, a voltage rail of the power supply may be out of specification. The BMC monitors voltages and prevents power on when power values are out of specification.

The system will not boot.

Step 1. Examine the display panel LEDs for warning or fault indications. The system LED will be flashing yellow with a warning indication and flashing red with a fault indication.

Step 2. Examine the four diagnostic LEDs for indications of specific warning or fault indications. The diagnostic LEDs present patterns that categorize the source of the warning or fault.

Step 3. Display and examine the system event log (SEL) and forward progress log (FPL) for further information relating to warning or fault indication.

Step 4. Review the firmware revisions of all firmware.

Step 5. Use the BMC command line interface (cli) to cycle the system power, `cli>pc off, cli>pc on`.

Step 6. Turn the server off, wait at least twenty seconds, then turn the server back on to see if the failure can be cleared.

Step 7. Check that all DDR DIMMs are seated properly.

Step 8. Check that the DDR DIMM configuration on the system board matches those approved. A minimum of one DDR DIMM pair must be installed.

Step 9. Verify that the DIMMs are fully seated. When the DIMM is fully seated in the mating connector, the retaining latches are closed (they should be flush with the front of the DIMM). If the latches are not closed, reseat the DIMM fully by engaging the retaining latches and closing them fully.

Step 10. Check that the processors are installed in the correct sockets and that each processor has a power pod installed. Also verify that the processors are of the same type.

Step 11. Check the boot order with the SCSI configuration utility.

Step 12. If there are no obvious errors, reflash the BMC firmware. Refer to Chapter 4, Utilities, for instructions.

Step 13. If the system will still not boot, it may be necessary to replace the base unit.

The system has intermittent failures.

Step 1. Examine the display panel LEDs for warning or fault indications. The system LED will be flashing yellow with a warning indication and flashing red with a fault indication.

Step 2. Examine the four diagnostic LEDs for indications of specific warning or fault indications. The diagnostic LEDs present patterns that categorize the source of the warning or fault.

Step 3. Display and examine the system event log (SEL) and forward progress log (FPL) for further information relating to warning or fault indication.

Step 4. Make sure that the system fan assemblies are fully seated.

Step 5. Verify that the server is plugged into a power source that is within specifications described on the label of the power supply.

Step 6. Make sure that the internal SCSI chain is terminated and that termination is not enabled on any of the drives. Note that with LVD SCSI, termination is provided in the cable.

Step 7. Check that the processors are installed in the correct sockets and that terminators are installed in all unused sockets.

Step 8. Reseat the main memory DDR DIMMs.

Step 9. If date and time or customer settings are being cleared, the system board battery may need to be replaced.

The system LED or diagnostic LEDs are not on and no error messages appear.

If the server does not work (with no LEDs illuminated) and no error messages appearing, check the following:

Step 1. Make sure that all cables and the AC power cord are plugged into their proper receptacles.

Step 2. Make sure that the AC outlet is working. If the server is plugged into a switched multiple-outlet box, make sure that the switch on the outlet box is turned on.

Step 3. Make sure that the server is turned on (the power-on light should be green and the fans should be on).

Step 4. Turn the server off, wait at least twenty seconds, then turn the server back on to see if the failure can be cleared.

Step 5. Make sure that all boards are installed properly and the processors are installed in the correct slot. They must be seated firmly in their slots and any cables must be connected firmly.

Step 6. If the server stopped working after you installed a new board, remove the board and turn on the server. If your server now works, check the installation instructions received with the new board for correct installation method. If the new board is preventing the server from powering on, it is likely to have a serious electrical problem.

Step 7. If the server still does not work, remove all boards and options that you have installed (do not remove the hard disk drives) and turn on the server.

Step 8. Add the boards and options one at a time to determine which one is causing the problem.

Step 9. If you have added any memory, make sure that the DDR DIMMs are seated properly in the board. Also check the DDR DIMM configuration, and that the DDR DIMMs are matched pairs.

Power goes off on the server and does not come back on.

When certain critical conditions exist, the server shuts down all power.

The critical conditions that may shut down the server are:

- Critical temperature fluctuations or changes
- Voltage problems (external AC line)
- Power supply failure

If the server powers off, and before you try a restart, do the following:

Step 1. Examine the display panel LEDs for warning or fault indications. The system LED will be flashing yellow with a warning indication and flashing red with a fault indication.

Step 2. Examine the four diagnostic LEDs for indications of specific warning or fault indications. The diagnostic LEDs present patterns that categorize the source of the warning or fault.

Step 3. Display and examine the system event log (SEL) and forward progress log (FPL) for further information relating to warning or fault indication.

Step 4. First check to make sure power is getting to the server. Plug a known working device into the power outlet.

Step 5. Check for proper ventilation for the server. The server should have at least three inches of space around the front and rear for proper airflow when installed in a rack.

NOTE Temperature problems may be caused by a fluctuating power supply.

Step 6. Check the system specifications and make sure the environmental temperature and voltage are in the specified guidelines.

Step 7. Monitor the system to make sure you are not experiencing further temperature and voltage problems.

Troubleshooting and FRU identification

Once you have determined the current system state, you must troubleshoot the system to determine what the problem symptoms are and what repair actions to take.

Use this guide to assist you in repairing the system by matching the problem symptom with the appropriate troubleshooting step.

Table 5-1 Problem Symptoms Repair Actions

Problem or Symptom	Problem Indicators	Normal Functioning Indicators	Troubleshooting Steps	Potential FRUs
No indication of housekeeping voltage present when AC is connected and power switch is in the off position.	• Standby LED is off when AC is plugged into system. • BMC “heartbeat” not flashing.	• Power LED Off. • Power LED on MP board (if installed) should be lit solid green. • Standby LED on system board is on steady. • BMC “heartbeat” LED on system board is flashing.(if installed) should be lit solid green.	1. AC must be present. Check that PDU is plugged in. 2. Ensure there is a working power supply. The LED on the supply should be lit. 3. Check for an EFI shell prompt (**CTRL+B**) at console.	• No AC present • Power supply • Power distribution • System board • Display board

Table 5-1 Problem Symptoms Repair Actions (Continued)

Problem or Symptom	Problem Indicators	Normal Functioning Indicators	Troubleshooting Steps	Potential FRUs
System will not power on when display panel Power switch is turned on.	• Display panel power LED stays off when power is turned on. • System LED may be flashing yellow (attention indication).	• Power switch on. • Power LED on steady green. • System LED is off.	1. Ensure there is a working power supply. The LED on the supply should be lit. 2. Verify that standby voltage is present. Check that the STBY LED on the system board is lit. 3. Verify that the baseboard management controller is functioning. Check the heartbeat (BMC) LED on the system board is lit. 4. Check system event log (SEL). Look for event log detail = Low Voltage DC power. This indicates a failure of one of the CPU power pods. The failing CPU power pod is indicated in the Source ID field.	• Power supply • CPU power pod • System board • Intrusion switch on chassis (cover not completely closed)
No EFI Main Menu prompt.	• Display panel power LED is not steady green. • No system events are being displayed at the console. • There is no EFI Main Menu prompt at the console.	• Display panel power LED is steady green. • System events are being displayed at the console. • EFI Main Menu prompt.	1. Check that the console is properly connected and that you can communicate with the BMC (**CTRL+B** should get you the MP login prompt). 2. Check system event log (SEL). Look for entries related to: • Processors • Processor support modules (also known as power pods). • Memory 3. Check for a red LED on the MP card if installed. If lit red, the problem is with the MP. 4. Reduce to minimum configuration and troubleshoot from there.	• Processors • Processor support modules • Memory • System board • Console

Table 5-1 Problem Symptoms Repair Actions (Continued)

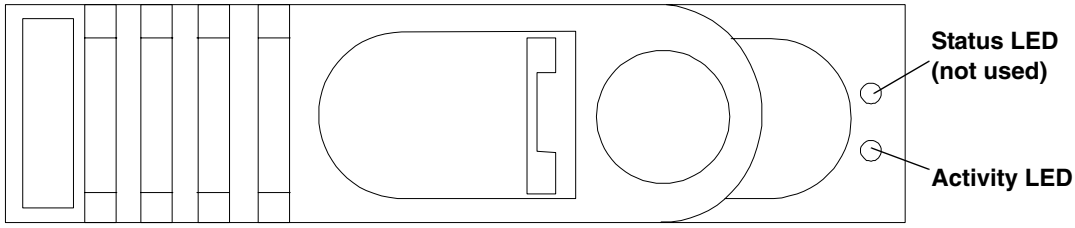
Problem or Symptom	Problem Indicators	Normal Functioning Indicators	Troubleshooting Steps	Potential FRUs
Cannot boot to initial system loader (ISL)	• Console messages indicating problems booting from the primary or alternate boot path.	• Console messages and prompt indicating you are at ISL.	1. Use EFI shell commands to verify I/O and presence of valid devices. 2. Use EFI boot manager `boot info` command to determine boot related information. 3. Check system event log (SEL) for detailed message(s). 4. Remove I/O cards to eliminate them as cause of problem.	• Boot path configuration error • SCSI cable not connected from channel A to drive cage • Hard disk drive • Disk drive cage backplane • SCSI interface on system board
Cannot boot to operating system (OS).	• Boot error messages. • System LED blinking.	• OS prompt. • OS boot messages. • System LED on steady green.	1. Check system event logs for possible problem indication. 2. Run ODE diagnostics.	• Processor • Hard disk drive • Disk drive cage backplane • SCSI interface on system board • Corrupt OS

Verifying Hard Disk Drive Operation

Each hard disk drive has an activity LED indicator on the front of the drive.

NOTE On the hp Integrity rx1620 Server only the Activity LED is used. The Status LED is disconnected.

Figure 5-1 LED Apertures on Hard Disk Drive



Lightpipes on the disk drive transmit light to these apertures from LEDs on the inside rear of the hot-swap mass storage cage. Verify that the LED shows the correct activity indication for all disk drives that you installed:

Step 1. Turn on power to the HP Server and display monitor.

Step 2. During the boot sequence, watch the Activity LED on each hard disk drive:

- **Activity LED**: The LED quickly cycles from amber to green. The LED stays steady green until the drive spins up.

Step 3. If the status LED were illuminated on any disk drives, the drive cage may not be correctly installed. Check installation as follows:

a. Turn off the HP Server power switch and unplug the AC power cords and any cables.

b. Disconnect the power distribution cable between the drive cage and the power distribution module and then reconnect it.

c. Verify that the SCSI interface is correctly installed from SCSI A channel connector on the system board to the connector on the SCSI cage.

d. Check the SCSI bus for proper loading,

e. Reconnect the AC power cords and any cables. Restart the HP Server to determine whether the LEDs now become illuminated during the boot. If not, contact your reseller.

Step 4. If the LED indicator on a single disk drive is not illuminated during boot, the disk drive may be installed incorrectly, or its lightpipes may be damaged.

Check the lightpipe on the disk drive as follows:

a. Remove the disk drive.

b. Inspect the lightpipes for damage. If a lightpipe is damaged, contact your reseller.

CAUTION The lightpipes are fragile. Be careful not to damage them when you inspect them or when you reinsert the disk drive.

c. Reinstall the disk drive.

d. Restart the HP Server to determine whether the LED now becomes illuminated during the boot. If not, contact your reseller.

Step 5. Use the EFI shell command info io to check the SCSI drives.

Identifying and Diagnosing Hardware Problems

Should a failure occur, the system LED, the LAN LED, the diagnostic LEDs, and the system event log (SEL) will help you identify the problem:

- LEDs. The system LED, LAN LED, and diagnostic LEDs on the display panel of the server change color and blink in different patterns to help identify specific problems. LEDs on the front and rear panels of the server display LAN activity.
- The System Event Log (SEL) provides detailed information about the errors identified by the LEDs.

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

Power and System LEDs

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

NOTE When the optional management processor (MP) card is installed, the four diagnostic LEDs on the display panel are disabled.

Systems with the Optional Management Processor Card Installed

The following system LED states exist for systems having a optional management processor card installed.

Table 5-2 System LED States

System LED	State
Off	Off
Solid green	Running OS
Blinking green	Booting or running code other than operating system (boot or diagnostic).

Table 5-2 System LED States (Continued)

System LED	State
Blinking yellow (1/sec.)	Attention indication: Alerts of levels 3-5 detected in the optional management processor logs. The LED will turn off once the event log has been read.
Blinking red (2/sec.)	Fault indication: System alert level 7 detected, LED will blink until the problem is resolved and the system boots successfully or until it is manually turned off. The LED will turn off once the event log has been read.

For system alerts of levels 3-5, the attention condition on the system LED can be cleared by accessing the logs using the sl command available in the optional management processor command mode or the EFI cli `cli>sl e` command.

The fault condition for system alerts of level 7 can only be cleared with the dc command unless hardware replacement is necessary.

NOTE Always check the optional management processor system event logs (SEL) in the case of a blinking yellow or red System LED before replacing any hardware.

Management Processor (MP) Card Event Logs

The management processor provides diagnostic and configuration capabilities. To access the management processor, perform the following:

NOTE The management processor must be accessed from a terminal console which has access to the Management Processor (MP) card.

Step 1. If necessary, press **CTRL+B** to access the management processor.

Step 2. Log in with proper username and password.

NOTE Default operator login and password: login = “oper”, password = “oper”.

Step 3. Press “cl” to display the console history log. This log displays console history from oldest to newest.

Step 4. Press “sl” to display the status logs. The status logs consist of:

- System Event
- Forward Progress
- Current Boot

- Previous Boot
- Live Events
- Clear SEL/FPL Logs

Step 5. For a complete explanation of configuring the management processor and using the MP commands, see Chapter 4, “Utilities.”

System Event Logs (SEL) Logs

Step 1. Access the management processor command prompt.

Step 2. Run the `sl` command. The Event Log Viewer menu will display:

```
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:
```

Step 3. Select **e** to review the system events. The Event Log Navigation menu will display:

```
Enter menu item or [Ctrl-B] to Quit: e


       Log Name            Entries    % Full      Latest Timestamped Entry

-------------------------------------------------------------------------

   E - System Event           12         1 %      31 Oct 2003 23:37:45


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

   F       First entry

   L       Last entry

   J       Jump to entry number

   H       View mode configuration - Hex

   K       View mode configuration - Keyword

   T       View mode configuration - Text

   A       Alert Level Filter options

   U       Alert Level Unfiltered

   ?       Display this Help menu

   Q       Quit and return to the Event Log Viewer Menu

   Ctrl-B  Exit command, and return to the MP Main Menu

MP:SL (+,-,<CR>,D, F, L, J, H, K, T, A, U, ? for Help, Q or Ctrl-B to Quit) >a

Alert Level Threshold Filter:

   1  : Major Forward Progress

   2  : Informational

   3  : Warning

   5  : Critical

   7  : Fatal

Enter alert level threshold or [Q] to quit filter setup: 3

   -> Alert threshold level 3 filter will be applied.

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
```

Step 4. Select **a**, then a threshold filter number to filter events to desired level.

```
MP:SL (+,-,<CR>,D, F, L, J, H, K, T, A, U, ? for Help, Q or Ctrl-B to Quit) >a


Alert Level Threshold Filter:

   1  : Major Forward Progress

   2  : Informational

   3  : Warning

   5  : Critical

   7  : Fatal


Enter alert level threshold or [Q] to quit filter setup: 3


   -> Alert threshold level 3 filter will be applied.
```

Step 5. 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:
```

Step 6. 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
```

NOTE More detailed information on the system logs is presented in Chapter 4, “Utilities.”

Systems without a Management Processor Card

The system LED states operate the same with systems having the optional management processor card.

Table 5-3 Power and System LED States

Power LED	System LED	State
Off	Off	Off
On (green)	Solid green	Running
On (green)	Blinking green	Booting or running code other than operating system (boot or diagnostic).
On (green)	Blinking yellow (1/sec.)	Attention indication
On (green)	Blinking red (2/sec.)	Fault indication

Diagnostic LEDs

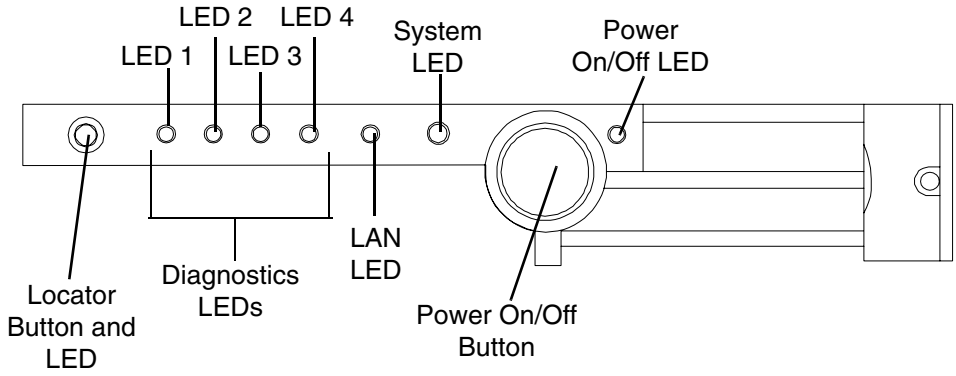
Four diagnostic LEDs are provided on the display panel of the system. Additional diagnostic LEDs are provided on the system board and are described later in this chapter.

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

- If no management processor card is installed, the boot progress is monitored by diagnostic LEDs 1 through 4. During the boot-up the LEDs will turn on in sequence until the EFI prompt is reached.

- If a management processor card is installed, the boot process will be monitored by the management processor card. The diagnostic LEDs are disabled.

Figure 5-2 Diagnostic LEDs



- The system LED indicates the severity of the error. Check the system LED before proceeding to analyze the sequence of diagnostic LEDs:
  - System LED blinking YELLOW indicates a WARNING.
  - System LED 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 pattern of illuminated LEDs may be used to identify the category of the fault or warning. For example, if diagnostic LED one is red, there is a problem with memory. However, if diagnostic LEDs one and two are both red, there is a problem with the system processor.

If the diagnostic LEDs indicate an error, check the EFI shell command line interface (CLI) cli>sl e to display the system event log (SEL) for a more detailed explanations of the failure.

The faults and warnings fall into several general categories.

Table 5-4 Diagnostic LEDs Fault and Warning Categories

LED 1	LED 2	LED 3	LED 4	Category
Red	Any[a]	Any[a]	Any[a]	Memory
Any[a]	Red	Any[a]	Any[a]	Firmware
Any[a]	Any[a]	Red	Any[a]	System Board
Any[a]	Any[a]	Any[a]	Red	Fan
Red	Red	Any[a]	Any[a]	Processor

Table 5-4 Diagnostic LEDs Fault and Warning Categories (Continued)

LED 1	LED 2	LED 3	LED 4	Category
Red	Any[a]	Red	Any[a]	BMC
Red	Any[a]	Any[a]	Red	Temperature
Any[a]	Red	Any[a]	Red	Power Supply
Red	Red	Red	Red	Unknown

a. This LED can display any color other than red (for example, green or off).

Warnings

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

Table 5-5 Unknown Warning

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Red	Red	Red	Red	Unknown warning.	View the SEL `cli>sl e` for additional information. For further assistance, contact your HP Support Engineer.

Table 5-6 Memory Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Red	Green	Off	Off	Mismatched memory pairs.	View the SEL for additional information. Review the information on installing memory in “Installing and Configuring” in the *hp Integrity rx1620 Maintenance Guide*.
Flashing Yellow	Red	Off	Green	Green	Memory thermal load order.	View the SEL for additional information.
Flashing Yellow	Red	Green	Green	Green	Bad serial presence detect (SPD) information (can't detect type).	View the SEL for additional information. For further assistance, contact your HP Support Engineer.

Table 5-7 System Board Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Green	Green	Red	Off	Battery voltage low	Replace the system board battery.

Table 5-8 Fan Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Green	Off	Off	Red	Cooling Unit 1 (PSU) is not functioning properly	Replace the fan that is not functioning.[a]
Flashing Yellow	Off	Green	Off	Red	Cooling Unit 2 (memory) is not functioning properly	Replace the fan that is not functioning.[a]
Flashing Yellow	Off	Off	Green	Red	Cooling Unit 3 (CPU) is not functioning properly	Replace the fan that is not functioning.[a]

a. Refer to “Removing and Replacing Components” in the *hp Integrity rx1620 Maintenance Guide* for detailed instructions on the maintenance action.

Table 5-9 Processor Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Red	Red	Green	Off	Processor 0 temperature exceeds limit	Make sure nothing is blocking the system’s airflow and locate your system in an air-conditioned room.
Flashing Yellow	Red	Red	Off	Green	Processor 1 temperature exceeds limit	Make sure nothing is blocking the system’s airflow and locate your system in an air-conditioned room.

Table 5-10 Temperature Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	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.

Table 5-11 Video Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Off	Red	Red	Off	No video adapter present	Install a video adapter. See the installation instructions shipped with the video adapter.

Table 5-12 Power Supply Warnings

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Yellow	Green	Red	Off	Red	Power supply fault	Check the power supply LED. Replace the power supply.

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.

Table 5-13 Unknown Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Red	Red	Red	Red	Unknown fault.	View the SEL for additional information. For further assistance, contact your HP Support Engineer.

Table 5-14 Memory Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Red	Green	Off	Off	Mismatched memory pairs.	Review the information on installing memory in "Installing and Configuring" in the *hp Integrity rx1620 Maintenance Guide*.
Flashing Red	Off	Off	Off	Green	Fatal memory error.	Replace memory.
Flashing Red	Red	Green	Green	Off	No memory installed.	Install memory.

Table 5-14 Memory Faults (Continued)

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Red	Green	Green	Green	Bad Memory. One or more DIMMs are bad or not seated properly.	Reseat the DIMMs. If the error persists, replace them.

Table 5-15 Firmware Errors

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Off	Red	Off	Off	System Firmware Hang	View the SEL for additional information. For further assistance, contact your HP Support Engineer.

Table 5-16 System Board Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Off	Green	Red	Off	VRM overvoltage	View the SEL for additional information. For further assistance, contact your HP Support Engineer.
Flashing Red	Green	Off	Red	Off	VRM undervoltage	View the SEL for additional information. For further assistance, contact your HP Support Engineer.

Table 5-17 Fan Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Green	Off	Off	Red	Cooling Unit 1 (PSU) fault	Replace the fan that is not functioning.[a]
Flashing Red	Off	Green	Off	Red	Cooling Unit 2 (memory) fault	Replace the fan that is not functioning.[a]
Flashing Red	Off	Off	Green	Red	Cooling Unit 3 (CPU) fault	Replace the fan that is not functioning.[a]

a. Refer to "Removing and Replacing Components" in the *hp Integrity rx1620 Maintenance Guide* for detailed instructions on the maintenance action.

Table 5-18 Processor Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Red	Red	Green	Off	Processor 0 temperature exceeds limit	Make sure nothing is blocking the system's airflow and locate your system in an air-conditioned room. In a single CPU configuration, verify that the airflow blocker is installed.
Flashing Red	Red	Red	Off	Green	Processor 1 temperature exceeds limit	
Flashing Red	Red	Red	Green	Green	No processor detected.	Verify that the processor or processors are correctly installed. See "Installing and Configuring" in the *hp Integrity rx1620 Maintenance Guide* for installation procedures.

Table 5-19 BMC Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Red	Green	Red	Off	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 base unit.
Flashing Red	Red	Green	Red	Green	System board FRU inventory device inaccessible	Replace the base unit.

Table 5-20 Temperature Faults

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	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.

Table 5-21 Power Supply Errors

System LED	LED 1	LED 2	LED 3	LED 4	Problem	Solution
Flashing Red	Off	Red	Off	Red	VRM or power pod fault	View the SEL for additional information.
Flashing Red	Green	Red	Off	Red	Power Supply fault	View the SEL for additional information. Replace the power supply if necessary.
Flashing Red	Green	Red	Green	Red	12V out of range (power supply interface fault)	View the SEL for additional information. If the power supply interface has failed it is necessary to replace the base unit.

Command Line Interface

The baseboard management controller (BMC) is accessable by means of the BMC console commands or command line interface (CLI). The commands are similar to the management processor (MP) commands but are slightly less interactive.

Detailed information on the CLI commands is provided in Chapter 4, “Utilities.”

Command Line Interface Menu

The command line interface (CLI) provides the following menu selections:

date: Date display

help: List available commands

ipmi: Send IPMI cmd

loc: System locator LED

passwd: Change password

pc: Power control

pr: Power restore policy

ps: Power status

rs: System reset (through RST signal)

sl: Show logs

sr: Display firmware revisions

tc: System reset (through INIT signal)

exit: Exit

Troubleshooting Example Using CLI

This example uses the cli and the SEL to display error messages indicating that no memory is installed.

```
cli>sl e

#  Sev Generator/Sensor Description  Event ID    Data, Timestamp

---- - ---------------- ------------ ----------- --------------------------


00A0 - SFW              FW error     00-0F:70:40 3F:--  2003-10-31 22:29:06

00B0 7 CPU0             Mem no DIMMs    000D0    DT 00  0000000000000000

00C0 7 CPU0             Mem no DIMMs    000D0    Time   2003-10-31 22:29:06

00D0 - SFW              FW error     00-0F:70:40 3F:--  2003-10-31 22:29:06

00E0 7 CPU0             Halt boot       00037    DT 04  000000000000000F

00F0 7 CPU0             Halt boot       00037    Time   2003-10-31 22:29:06
```

Troubleshooting Example Using CLI

This example uses the cli and the SEL to display error messages indicating that fan 2 (memory fan) has failed.

```
cli>sl e

#  Sev Generator/Sensor Description  Event ID    Data, Timestamp

---- - ---------------- ------------ ----------- --------------------------

0010 - BMC              Chass cntrl  00-12:70:A3 81:03  2003-10-31 22:39:02

0020 - BMC              LPC reset    00-12:70:02        2003-10-31 22:39:03

0030 - Fan 1 (PSU)      OK           11-0A:07:00        2003-10-31 22:39:04

0040 - Fan 3 (CPU)      OK           13-0A:07:00        2003-10-31 22:39:04

0050 - ACPI State       S0 (on)      FA-22:6F:00        2003-10-31 22:39:05

0060 - SFW              Boot start   00-1D:0A:00        2003-10-31 22:39:05

0070 2 CPU1             Boot start      00063    DT 04  0000000000000000

0080 2 CPU1             Boot start      00063    Time   2003-10-31 22:39:05

0090 - BMC              LPC reset    00-12:70:02        2003-10-31 22:39:07

00A0 - SEL Time Set     Set          FD-C0:03:01        2003-10-31 22:39:15

00B0 - Fan 2 (Mem)      Fail (crit)  12-0A:07:02        2003-10-31 22:39:24

00C0 - BMC              Chass cntrl  00-12:70:A3 00:E2  2003-10-31 22:39:31

00D0 - ACPI State       S5 (off)     FA-22:6F:05        2003-10-31 22:39:32
```

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.

Rear Panel LAN LEDs

There are three LAN connectors on the rear panel. They are:

- 1Gb LAN A connector
- 1Gb LAN B connector
- Optional MP 10/100Mb LAN C connector

LAN A Connector LEDs

The 1Gb LAN A interface provides four LEDs on the rear panel:

Table 5-22 1Gb LAN A Connector LEDs

LAN LED	Location	Color	State
Not used	Top	None	None
1000mb	2nd from top	Amber	Blinking amber – the 1000 Mbps with ethernet protocol and twisted-pair wiring is enabled. Off – no link.
100mb	2nd from bottom	Green	Blinking green – the 100 Mbps with ethernet protocol and twisted-pair wiring is enabled. Off – no link.
Activity	Bottom	Green	Blinking green – The Activity LED lights, and all other LEDs are off for a 10 Mbps connection. Off – no activity

LAN B Connector LEDs

The 1Gb LAN B interface provides two LEDs on the rear panel (the left LED is not used):

Table 5-23 1Gb LAN B Connector LEDs

Link LED	Output
Activity	Blinking Orange
Link w/no activity	Solid Orange
No link	Off

Optional Management Processor LAN C Connector LEDs

The optional 10/100Mb LAN C interface provides four LEDs on the rear panel if the management processor card is installed:

Table 5-24 Optional Management Processor Card LAN C LEDs

LAN LED	Location	Color	State
Self-test	Top	Yellow	Management processor running selftest or error
		Off	Management processor has booted
10BT	2nd from top	Green	10BT link established
		Blinking green	10BT activity
		Off	No link or 100BT link
100BT	2nd from bottom	Green	100BT link established
		Blinking green	100BT activity
		Off	No link or 10BT link
Standby Power	Bottom	Green	Standby power on
		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.

Figure 5-3 Location of the STBY, F/W and BMC LEDs

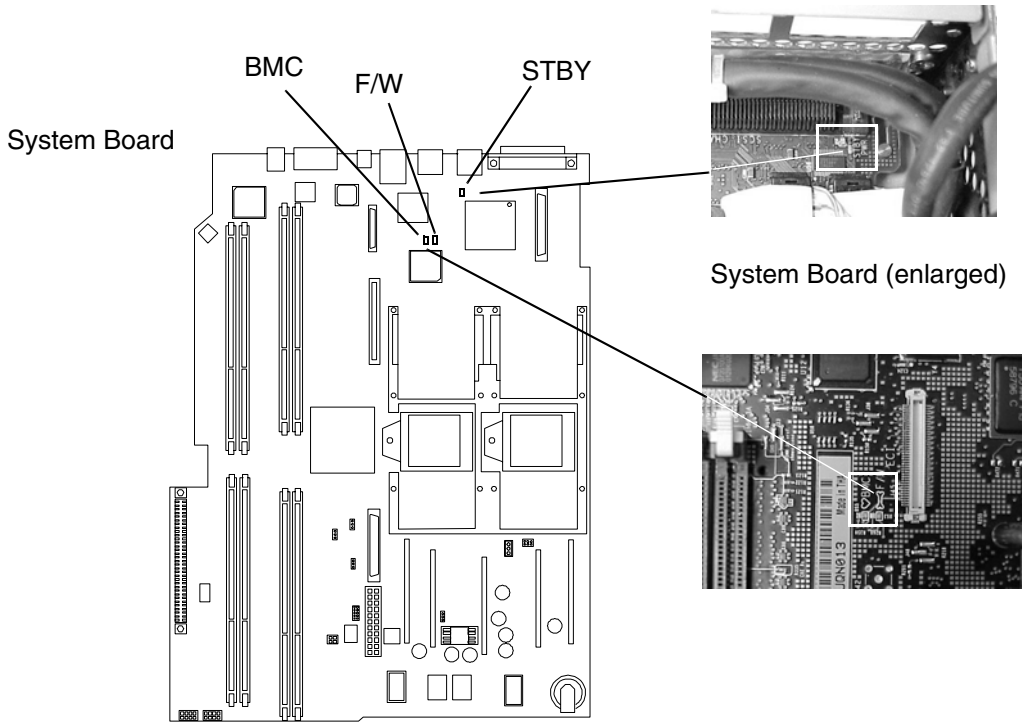


Table 5-25 System Board LEDs

LED	Description
STBY (power good)	This green standby LED comes on as soon as the system's power cord is plugged in. If this light is off when the system is plugged in, check the AC power cord, reseat the power supply, and if this does not work, replace the power supply.
BMC (heartbeat)	A few seconds after the system is plugged in this green LED starts blinking, which means that the baseboard management controller (BMC) is alive. If this LED is not blinking and the STBY (standby) LED is on, you may have to replace the base unit.
F/W	A few seconds after the system power is turned on, the system firmware code fetch green 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 base unit.

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 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.

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

Step 1. Insert the *IPF Offline Diagnostics and Utilities CD* in the CD or DVD drive.

Step 2. From the EFI shell, 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 Not all of the information from the actual screen display is presented on the above example. The information has been truncated to fit within the margins of this page.

b. Change to the CD/DVD drive:

```
Shell> fs0:

fs0:>
```

Step 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: fs0:\EF

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: fs0:\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)
```

Step 4. Execute the `LaunchMenu` command to reboot from the CD and launch e-DiagTools.

```
fs0:\BOOT> launchmenu
```

Step 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.

Step 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:

Step 1. Start e-DiagTools and select **Run e-DiagTools for IPF** from the main menu.

Step 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.

Step 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
```

Step 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 - rx1620

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. Browse the support ticket screen 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.

Step 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:

Step 1. Select View Release Notes and Documentation Menu.

Step 2. Browse the documentation and release notes.

running ODE from the offline Diagnostics and Utilities DVD

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 DVD:

Step 1. Insert the CD into the DVD drive and reset system power, the system should come up to the boot manager.

Step 2. If the boot manager is already configured, and the DVD drive is configured as one of the boot devices, you move the cursor to the line which shows the DVD drive, and press Enter. The CD then will boot to the Launch Menu.

Step 3. Select Run the Off-line Diagnostic Environment (ODE) from the launch menu.

NOTE If you are unable to boot from your 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 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, a conceptual overview, and a quick reference guide to ODE. Also see the section titled “Diagnostics (Support Tools) General,” especially the *Support Plus: Diagnostics User's Guide*. “Using the SupportPlus Media to Run Offline Diagnostics” is useful for more information on what ODE is, and how to run it.

NOTE Ignore references to the SupportPlus Media in the *Support Plus: Diagnostics User's Guide*, Chapter 3: they do not apply to the hp Integrity rx1620 Server system. However, the conceptual and procedural information still applies to IPF systems. Any discrepancies have been noted and explained in the *Support Plus: Diagnostics User's Guide*, and elsewhere, as appropriate.

Using Offline Diagnostic Tools

There are three offline Diagnostic tools you can use to troubleshoot your hp Integrity rx1620 Server:

- E-DiagTools-available on the *IPF Offline Diagnostics and Utilities CD* and the HP Service partition.

NOTE For machines using HP-UX the HP service partition is not available and the *IPF Offline Diagnostics and Utilities CD* must be used.

- Offline Diagnostic environment (ODE)—available on the*IPF Offline Diagnostics and Utilities CD*.
- Management Processor (MP) card event logs-available by logging on to the management processor interface.

E-DiagTools

E-DiagTools is used to evaluate the hardware problems of your HP Server. To access E-DiagTools, perform the following:

Step 1. Power on your HP Server and insert the *IPF Offline Diagnostics and Utilities CD* into the DVD-ROM tray.

Step 2. Do not permit the server to boot into an Operating System and at the EFI Boot Manager, select EFI Shell.

Step 3. Determine the file system that represents the CD and enter the appropriate command to access the CD.

Step 4. After accessing the CD diagnostic menu, launch “e-DiagTools for IPF” and run the Basic and Advanced tests according to the menus.

Offline Diagnostic Environment (ODE)

ODE is used to evaluate specific hardware components via a Command Line Interface. To access ODE, perform the following:

Step 1. Power on your HP Server and insert the *IPF Offline Diagnostics and Utilities CD* into the DVD-ROM tray.

Step 2. Do not permit the server to boot into an Operating System and at the EFI Boot Manager, select EFI Shell.

Step 3. Determine the file system that represents the CD and enter the appropriate command to access the CD.

Step 4. After accessing the CD diagnostic menu, launch ODE.

Recommended Cleaning Procedures

Suggested cleaning procedures for the hp Integrity rx1620 Server are provided in the following table. Be sure to turn off power to the server when cleaning it.

Table 5-26 Cleaning

Component	Time Frame	Procedure
Keyboard	Regularly	Dust with damp, lint-free cloth.
Monitor screen	Regularly	Use “HP Video Screen Cleaning Solution” found in 92193M Master Clean Kit.
Mouse	Regularly	Refer to the mouse's manual for mouse maintenance procedures.
Cooling fans and grilles	6 Months	Check functions of cooling fans and clean the intake openings on the chassis of dust, lint, and other obstructions to airflow.

CAUTION DO NOT use petroleum-based cleaners (such as lighter fluid) or cleaners containing benzene, trichlorethylene, ammonia, dilute ammonia, or acetone. These chemicals could damage all plastic and painted surfaces.

Where to Get Help

HP customer care will help you solve server problems and, if necessary, initiate appropriate service procedures.

Support is available on the web and by phone.

For information on contacting the HP IT Resource Center (ITRC) near you, go to http://www.itrc.hp.com.

Information to Collect Before you Contact Support

Before you contact HP support, you should:

Step 1. Check the previous sections of this chapter and attempt to solve the problem.

- Note failure symptoms and error indications (LEDs and messages).
- Try to determine precisely what did or did not happen.

Step 2. Collect the following information:

- The model number of your server (rx1620).
- The product number of your server. This can be found on the identification label, which is found at the front of the unit. (Typically A6837B A6838B, and so on.)
- The serial number of your server. This can be found on the identification label.

Step 3. Be familiar with your system configuration.

- Are you using the LAN, RS232, or web interface to monitor the server?
- How many processors, DIMMs, and PCI cards have been installed?
- What versions of processor, memory, and PCI cards are used and where are they installed?
- What accessories are installed?

Step 4. Determine the following

- Which firmware versions are in use?
- When did the problem start?
- Have recent changes been made to the system?
- Which OS and version is in use?

Online Support

To contact HP Customer Support online, refer to the Worldwide Limited Warranty and Technical Support Guide or visit us at http://www.hp.com/go/bizsupport. On our web page, enter the server model number (rx1620) and search the field.

The following information is available on this web site:

- Software and firmware updates

- The latest drivers and utilities
- Additional documentation

Phone Support

To contact HP customer support by phone, go to the HP IT Resource Center (ITRC) near you, at http://www.itrc.hp.com. Local phone numbers are listed in your native language for help.

6 Specifications

This chapter provides the power requirements, physical requirements, and hardware specifications required for normal operation of the HP Integrity rx1620.

NOTE For information on operating conditions (environmental requirements), see the *hp Integrity rx1620 Site Preparation Guide* included on the *HP Server Documentation CD-ROM,* or posted under the rx1620 Server at http://docs.hp.com.

Hardware Specifications

Table 6-1 Hardware Specifications

Micro-processors	Intel® Itanium® (up to 2 processors). 1.3 GHz 3 MB, 1.5 GHz 3 MB.
Memory	Supports up to eight Double Data Rate (DDR) registered ECC Memory, in PC1600 DIMMs. Supported DDR DIMM sizes: 128MB, 256MB, 513MB, 1GB, and 2GB. Requires DIMMs to be added in pairs of equal capacity.
SCSI	Integrated Ultra-3 SCSI dual channel controller; 80 MB/s transfer rate with one internal 68-pin connector (channel A) and one external 68-pin connector (channel B).
LAN	Two 10Mb/100Mb/1Gb LAN (RJ-45) fast ethernet controller; with Wake-on-LAN enabled/disabled via BIOS setup.
PCI Slots	Two 64-bit PCI-X slots, 133 MHz, 3.3V slots. One full slot and one half slot.
Core I/O	One serial port, 2 USB 2.0 ports, 2 PCI-X slots, 2 SCSI channels and 1 IDE bus.
DVD-ROM	IDE interface; 48x speed.
Mass Storage	Maximum internal storage: two 146GB, 10K RPM drives.
External Storage	Optional.
Power Supply	460W power supply.

Dimensions and Weights

This section provides dimensions and weights of hp Integrity rx1620 Server components.

Component Dimensions

Table 6-2 Server Component Dimensions

Dimension	Value
Height-Inches (Centimeters)	1.75 (4.5)
Width-Inches (Centimeters)	17 (43)
Depth-Inches (Centimeters)	21.5 (54.6)
Weight-Pounds (Kilograms)	Unloaded 26 (9.7) Fully loaded <32(13.4)

A Event, Error, and Warning Messages

This appendix contains event, error and warning information for the hp Integrity rx1620 Server system:

- Extensible Firmware Interface (EFI) error and warning messages
- System Event Log (SEL) and Forward Progress Log (FPL) Entries

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.

Table A-1 EFI Error and Warning Messages

Error Number	Error/Warning Message	Solution
2	Insufficient resources to assign to one or more I/O devices	Incorrect I/O configuration. Contact the HP Support center for assistance.
4	Unexpected hardware I/O configuration	Incorrect I/O configuration. Contact the HP Support center for assistance.
7	No Baseboard Management Controller (BMC) installed in platform	Ensure the BMC ROM is installed; update BMC firmware
8	BMC cannot be accessed	Check system logs for errors. Replace the base unit.
9	One or more BMC ports failed	Communication with the BMC failed. Check power. Replace the base unit.
10	BMC system event log is full	Clear SEL
11	Platform SCR is bad	Contact the HP Support center for assistance.
12	Set time to BMC SEL failed	Communication with the BMC failed. Replace the base unit.
13	SEL get info failed	Communication with the BMC failed. Replace the base unit.
14	Initial BMC SEL event failed	Communication with the BMC failed. Replace the base unit.
15	Update of BMC buffered data failed	Communication with the BMC failed. Replace the base unit.
16	All Advanced Configuration and Power Interface (ACPI) BMC ports bad	Communication with the BMC failed. Replace the base unit.

Table A-1 EFI Error and Warning Messages (Continued)

Error Number	Error/Warning Message	Solution
17	Read error on BMC token	Communication with the BMC failed. Replace the base unit.
18	BMC token transmit checksum error	Communication with the BMC failed. Replace the base unit.
19	Error writing BMC token on download	Communication with the BMC failed. Replace the base unit.
20	Non-Volatile Memory (NVM) token access error	Communication with the BMC failed. Replace the base unit.
21	BMC token write error during NVM write through	Communication with the BMC failed. Replace the base unit.
22	Error reading BMC token on upload to NVM	Communication with the BMC failed. Replace the base unit.
23	Error reading BMC first boot token	Communication with the BMC failed. Replace the base unit.
24	Primary FIT failed	Reflash firmware
25	Secondary FIT failed	Reflash firmware
26	Processor Abstraction Layer (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 page de-allocation table (PDT) is disabled	Reseat DIMMs, if error persists replace bad DIMMs
30	Memory required reinterleave to get a good page 0	Information only, no action required.
31	One or more ranks have chipspare disabled	Information only, no action required.
33	One or more memory ranks are mismatched and deallocated	Check memory installation. Match DIMM part numbers within each quad.
34	Memory deallocated because of a loading error	Check memory installation. DIMMs must be installed with smallest capacity in the first quad, an equal or larger capacity in the second quad, and an equal or largest capacity in the third quad.
35	Memory is not loaded in recommended loading order	Check memory installation. DIMMs must be installed with smallest capacity in the first quad, an equal or larger capacity in the second quad, and an equal or largest capacity in the third quad.

Table A-1 EFI Error and Warning Messages (Continued)

Error Number	Error/Warning Message	Solution
36	The page deallocation table (PDT) is full	Clear with `pdt clear` command in EFI shell
37	At least one (1) CPU has bad fixed core ratio	Check processor installation. (Verify installation and that identical processors have been installed.)
38	All CPUs were slated for compatibility deconfig	Processor failure. Verify installation, then replace processor. Contact the HP Support center for assistance.
39	Incompatible CPUs detected	Check processor installation and match CPU part numbers. CPUs must be identical.
40	CPUs installed with mixed cache sizes	Check processor installation and match CPU part numbers. CPUs must be identical.
41	CPUs installed with mixed steppings	Check processor installation and match CPU part numbers. CPUs must be identical.
42	All CPUs are over clocked	Check processor installation and match CPU part numbers. CPUs must be identical.
43	At least one (1) CPU is over clocked	Check processor installation and match CPU part numbers. CPUs must be identical.
44	Monarch changed to lowest stepping CPU	Information only. If the message is repeated, contact the HP Support center for assistance.
46	CPUs loaded in wrong order	Reload processors in correct order.
48	System Abstraction Layer (SAL) NVM cleared	Information only, no action required
49	EFI NVM cleared	Information only, no action required
50	EFI NVM failed	Reboot the server. If the error message is repeated, contact the HP Support center for assistance.
51	CPU deconfigured by SAL_B	Check processor installation. (Verify installation.) Replace processor that was deconfigured.
52	A ROM revision is inconsistent with FIT or REVBLOCK	One or more firmware components (Firmware, BMC, MP) is out of date

Table A-1 EFI Error and Warning Messages (Continued)

Error Number	Error/Warning Message	Solution
53	Error building SMBIOS	Contact the HP Support center for assistance.
54	Failure constructing the EFI Memory Data Table (MDT)	Contact the HP Support center for assistance.
55	Universal Unique IDentifier (UUID) error	Update with sysset command.
56	Error reading CPU SMBIOS information ROM	Reboot the server. If the error message is repeated, replace the failing processor.
57	Error accessing Field Replaceable Unit (FRU) information	Replace the FRU which was reported. If the error message is repeated, contact the HP Support center for assistance.
58	Checksum error accessing FRU information	Replace the FRU which was reported. If the error message is repeated, contact the HP Support center for assistance.
59	FRU information version error	Replace the FRU which was reported. If the error message is repeated, contact the HP Support center for assistance.

SEL and FPL Log Entries

This section is a quick reference for the intelligent platform management interface (IPMI) events recorded in the SEL and FPL files. These logs are available via the management processor (MP) card interface or the BMC command line interface (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 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 `cli>sl -f` command displays the forward progress log. For example:

```
Rec#   Sev Generator/Sensor Description  Event ID    Data, Timestamp

-------- - ---------------- ------------ ----------- -------------------------
```

```
00000000 - BMC              Chass cntrl  00-12:70:A3 81:03  2003-10-31 22:41:29

00000002 - BMC              LPC reset    00-12:70:02        2003-10-31 22:41:30

00000003 - ACPI State       S0 (on)      FA-22:6F:00        2003-10-31 22:41:31

00000004 - Fan 1 (PSU)      OK           11-0A:07:00        2003-10-31 22:41:31

00000005 - Fan 2 (Mem)      OK           12-0A:07:00        2003-10-31 22:41:31

00000006 - SFW              Boot start   00-1D:0A:00        2003-10-31 22:41:32

00000007 2 CPU1             Boot start      00063    DT 04  0000000000000000

00000008 2 CPU1             Boot start      00063    Time   2003-10-31 22:41:32

00000009 0 CPU1                             00020    DT 00  0000000000000000

0000000A 0 CPU0                             00020    DT 00  0000000000000000

0000000B 0 CPU1                             0000E    DT 06  0001000000030000

0000000C 0 CPU0                             0000E    DT 06  0000000000030000

0000000D 1 CPU0             CPU monarch     0000C    DT 06  0000000000000000

0000000E 1 CPU0             CPU present     00261    DT 06  0000000000000000

0000000F 1 CPU1             CPU present     00261    DT 06  0000000000000001

00000010 0 CPU0                             00008    DT 00  0000000000000000

00000011 0 CPU1                             0005D    DT 03  0000000000000002

00000012 0 CPU0                             0024B    DT 00  0000000000000000

00000013 0 CPU0                             00006    DT 03  0000000000000000

00000014 0 CPU0                             00044    DT 06  02000000002A0400

00000015 - BMC              LPC reset    00-12:70:02        2003-10-31 22:41:34
```

The cli>sl -e command displays the system event log. For example:

```
#  Sev Generator/Sensor Description  Event ID    Data, Timestamp

---- - ---------------- ------------ ----------- --------------------------

0010 - Fan 2 (Mem)      Fail (warn)  12-0A:07:01        2003-10-31 22:17:32

0020 - BMC              Chass cntrl  00-12:70:A3 0E:E3  2003-10-31 22:19:31

0030 - ACPI State       S5 (off)     FA-22:6F:05        2003-10-31 22:19:33

0040 - Fan 1 (PSU)      Fail (crit)  11-0A:07:02        2003-10-31 22:19:49

0050 - BMC              Chass cntrl  00-12:70:A3 81:03  2003-10-31 22:21:30

0060 - BMC              LPC reset    00-12:70:02        2003-10-31 22:21:32

0070 - Fan 1 (PSU)      OK           11-0A:07:00        2003-10-31 22:21:32

0080 - Fan 2 (Mem)      OK           12-0A:07:00        2003-10-31 22:21:32
```

```
0090 - ACPI State       S0 (on)      FA-22:6F:00        2003-10-31 22:21:33
00A0 - SFW              Boot start   00-1D:0A:00        2003-10-31 22:21:33
00B0 2 CPU1             Boot start      00063    DT 04  0000000000000000
00C0 2 CPU1             Boot start      00063    Time   2003-10-31 22:21:33
00D0 - BMC              LPC reset    00-12:70:02        2003-10-31 22:21:35
00E0 - SEL Time Set     Set          FD-C0:03:01        2003-10-31 22:21:44
00F0 - SFW              EFI boot mgr 00-12:6F:41 8F:--  2003-10-31 22:22:08
0100 2 CPU0             EFI boot mgr    0020B    DT 04  0000000000000006
0110 2 CPU0             EFI boot mgr    0020B    Time   2003-10-31 22:22:09
0120 - BMC              Chass cntrl  00-12:70:A3 80:03  2003-10-31 22:24:35
0130 - ACPI State       S5 (off)     FA-22:6F:05        2003-10-31 22:24:35
0140 - Fan 1 (PSU)      Fail (crit)  11-0A:07:02        2003-10-31 22:25:00
0150 - BMC              Chass cntrl  00-12:70:A3 81:03  2003-10-31 22:25:24
0160 - BMC              LPC reset    00-12:70:02        2003-10-31 22:25:26
0170 - Fan 1 (PSU)      OK           11-0A:07:00        2003-10-31 22:25:26
0180 - ACPI State       S0 (on)      FA-22:6F:00        2003-10-31 22:25:27
0190 - SFW              Boot start   00-1D:0A:00        2003-10-31 22:25:27
01A0 2 CPU1             Boot start      00063    DT 04  0000000000000000
01B0 2 CPU1             Boot start      00063    Time   2003-10-31 22:25:27
01C0 - BMC              LPC reset    00-12:70:02        2003-10-31 22:25:29
01D0 - SEL Time Set     Set          FD-C0:03:01        2003-10-31 22:25:39
01E0 3 CPU0             Mem pair mis    0030B    DT 06  0000000000000B0A
01F0 3 CPU0             Mem pair mis    0030B    Time   2003-10-31 22:25:40
0200 3 CPU0             Mem thermal     0026F    DT 06  FFFFFFFF00FFFF72
0210 3 CPU0             Mem thermal     0026F    Time   2003-10-31 22:25:41
0220 - SFW              FW error     00-0F:70:40 3F:--  2003-10-31 22:25:41
0230 7 CPU0             Mem not fnd     000D1    DT 00  0000000000000000
0240 7 CPU0             Mem not fnd     000D1    Time   2003-10-31 22:25:41
0250 - SFW              FW error     00-0F:70:40 3F:--  2003-10-31 22:25:41
0260 7 CPU0             Halt boot       00037    DT 04  000000000000000F
0270 7 CPU0             Halt boot       00037    Time   2003-10-31 22:25:41
```

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.

The `v` command (view mode configuration) determines the format of the display:

- hex mode
- text mode
- keyword mode

Hex Mode Example:

```
0x5E800A7A00E00FD0 0000000000000003
```

Text Mode Example:

```
Log Entry 1: 31 Oct 2003 21:34:17

Alert Level 2: Informational

Keyword: Type-02 0a0700 657152

Cooling unit OK

Logged by: Baseboard Management Controller;  Sensor: Cooling Device - Fan 1 (PSU)

Data1: transition to OK

0x203FA2D559020020 FFFF0007110A0300




Log Entry 0: 31 Oct 2003 21:33:21

Alert Level 3: Warning

Keyword: Type-02 0a0701 657153

Cooling unit warning

Logged by: Baseboard Management Controller;  Sensor: Cooling Device - Fan 1 (PSU)

Data1: transition to Non-Critical from OK

0x203FA2D521020010 FFFF0107110A0300
```

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.

Table A-2 Missing Components

Data 2	Data 3	Missing Component
0x0C-0D		Power Pod 0-1
0x20-21		CPU 0-1
0x1E	0x01	Cooling Unit 1
0x1E	0x01	Cooling Unit 2
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 ChassisControl.

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

Table A-3 Chassis Control Commands

Command	Description
0x00	Hard Power Down
0x01	Power Up
0x03	Hard Reset
0x04	NMI/TOC/INIT

Table A-3 Chassis Control Commands (Continued)

Command	Description
0x0D	Soft Shutdown and Restart
0x0E	Soft Shutdown

Table A-4 Sensor Numbers

Sensor Number	Description
0x04	Power Button
0x0E	Wake On LAN
0x11-13	Cooling Units
0x40	Power Supply
0xCD-D3, 0xD5-D6	Voltage Sensors
0xD8	Ambient Temperature
0xD9-DA	CPU Temperatures
0xFA	ACPI

Table A-5 IPMI Origins

Number	Source
0x00	block transfer (BT)
0x03	command line interface (CLI)
0x07	intelligent platform management bus (IPMB)
0x08	inter IC (I2C)1
0x09	I2C2
0x0F	keyboard controller style (KCS)0
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.

Table A-6 Events Without Sensors

Triplet	Event	data 2	data 3	Notes
10:70:64	SEL almost full	1F	%full	The BMC logs this when the SEL is 75% full
12:70:64	BMC entering firmware update mode			
12:70:05	SFW flash Inlock			
12:70:06	Front panel lock			
12:F0:06	Front panel unlock			
12:70:64	Firmware update application: starting component update			
12:70:64	Firmware update application: ending component 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			

B System Information

Features Summary

Processor

- Two processor sockets
- One or two Itanium 2 CPUs: 1.3 GHz or 1.6 GHz, 3.0 MB L2 cache
- Front-side bus (FSB): 200MHz, double data rate, 6.4GB/s peak data bandwidth

Memory

- 8 memory DIMM slots
- 256MB, 512MB, 1GB and 2 GB standard 184-pin 2.5V DDR2100 registered ECC DIMMs (1.2" height)
- 125MHz memory bus frequency, 250MTransfers/s data, 8 GB/s peak data bandwidth
- Minimum system memory: 512MB (2x 256MB DIMMs)
- Maximum system memory: 16GB with 2GB DIMMs
- DIMMs are installed in pairs or quads
- Specific four DIMM configuration enables lock-step mode, chip spare (chip kill), and maximum memory bandwidth

I/O Expansion

- Two PCI-X 133MHz 64bit 3.3V slots
- Each PCI-X slot on a separate PCI-X bus
- Top PCI-X slot full length; bottom slot ½ length
- One 25W or two 15W cards supported

Internal Core I/O

- Dual channel SCSI U320 controller (LSI SYM53C1030); 1 SCSI channel cabled internally for integrated disks; 1 channel for 68pin external connector
- On internal disk backplane, two single connector attachment (SCA)-2 80-pin connectors for hot-plug SCSI disks
- IDE controller with 1 internal cabled connection for an optional “slim-line” optical device

External core I/O

- One U320 SCSI 68pin HDCI connector
- Two 10/100/1000Base-T Ethernet LAN port RJ-45 connector
- Two USB 2.0 ports

- One 16550 compatible serial port (DB9 connector); console port if no management processor (MP) card installed, general purpose serial port if MP installed

Power supply unit

- 100-240V AC inlet (autosensing)
- 460W DC output power

Motherboard manageability

- Baseboard Management Controller (BMC)
- Temperature monitoring & fan speed control by BMC
- BMC manageability console via built-in serial port
- IPMI protocol for communication between BMC, system, and ECI card
- Hardware diagnostic status displayable on the front status panel
- Locator LEDs and associated activation buttons—front and rear
- Field Replaceable Units (FRUs) monitored by BMC
- Wake-on-LAN capability from the 10/100BT LAN port

Enhanced server manageability, provided by the optional Management Processor (MP) card

- LAN telnet console
- Web console
- Serial port for local console
- Serial port for modem console
- Duplication of console screen content across all consoles
- VGA & 2D graphics display

Internal Disk Storage Options

- Two low-profile hot-pluggable Ultra320 SCSI disk bays
- Disk options: 36GB, 10K RPM; 73GB, 15K RPM; 146GB,10K RPM
- Minimum system configuration includes one disk

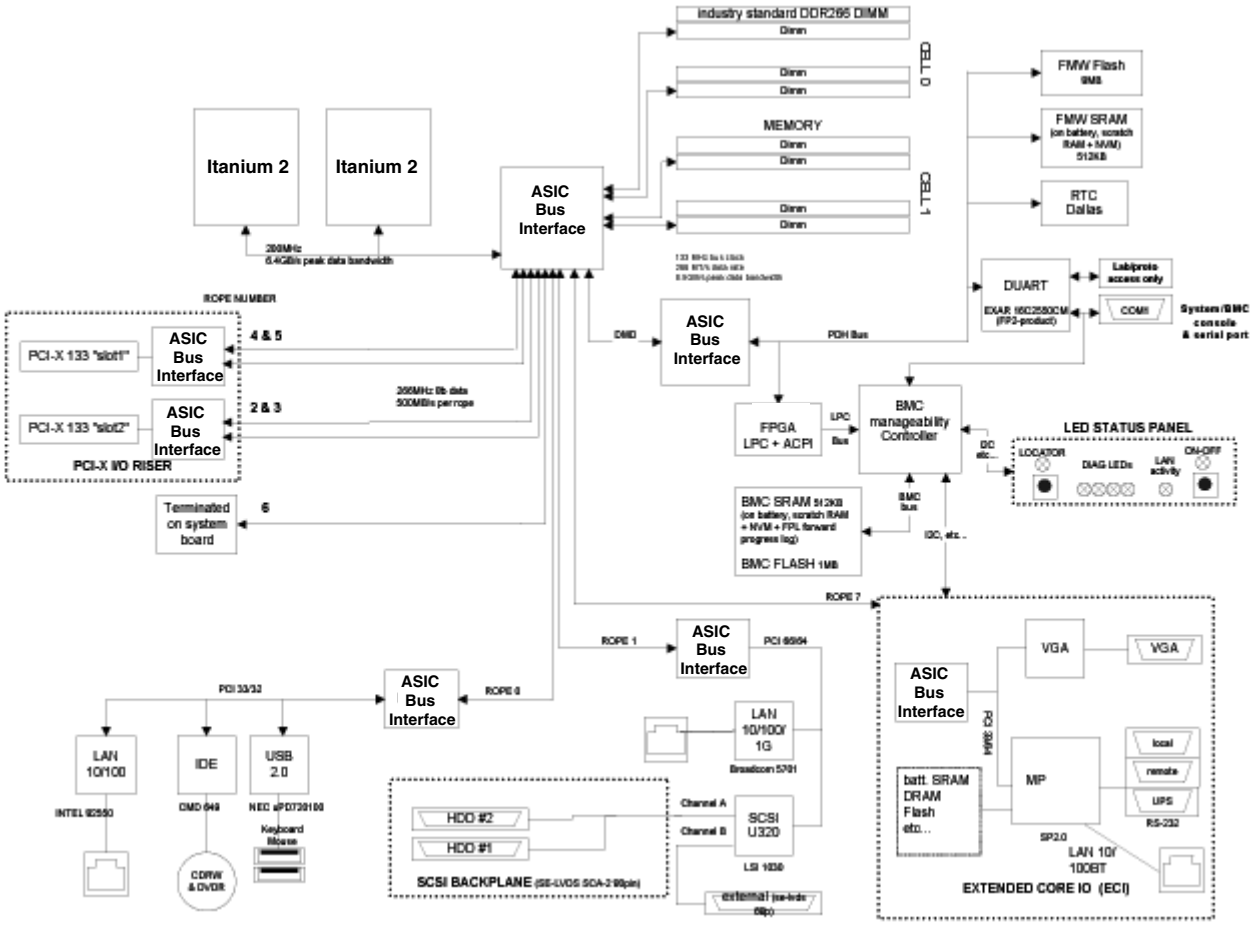
Internal Removable Media Options

- Single slimline removable media bay (IDE interface)
- Removable media devices supported DVD-ROM and DVD-RW
- Minimum system configuration does not include a removable media peripheral

System Board

This section provides a block diagram of the system board and descriptions of key components (integrated circuits) on the board.

Figure B-1 System Block Diagram



System Board Components

The following sections describes the main components of the system board:

- Intel Itanium 2 Processor (one or two processors supported)
- I/O and Memory Controller
- AGP/PCI Bus Controller
- Processor Dependent Hardware (PDH) Controller
- Dual Serial Controller
- Field Processor Gate Array (FPGA) Controller
- Baseboard Management Controller (BMC)

- SCSI Controller
- IDE Controller
- USB Controller
- 10/100BT Standard/Management LAN
- 10/100/1000 LAN

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:
  - 3MB, 12-way set associative (1 GHz)
  - 1.5 MB, 6-way set associative (900 MHz)
  - 128 byte line size

Processor Bus

The 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.

I/O and Memory Controller

The hp Integrity rx1620 Server supports the following features of the I/O and memory controller chip:

- 3.3 GB/s peak IO bandwidth.
- provides 7 communication paths.
- Peak memory bandwidth of 8.5 GB/s.
- 2 memory cells, 144 data bits each.

Memory Architecture

The memory subsystem includes the memory controller and the DDR SDRAM memory DIMMs, along with the memory bus traces and required termination. The memory subsystem provides two memory cells, 144 bits wide each (128 bits of data, 16 bits of ECC). Each cell can accommodate up to 6 DIMM slots; however, in Nemesis, power limitations restrict the total loaded DIMM count to 6. Two of the DIMMs connect to cell 0,

and the other 4 DIMM slots connect to cell 1. For early Nemesis prototypes, 8 DIMM connectors will be loaded onto system boards to facilitate power characterization; if actual power consumption is low enough, a change request could be entertained to increase the DIMM count to 8.

The memory bus clock speed is 125MHz, and the data transfer rate is 250Mtransfers/second as data is transmitted on both edges of the clock. The peak data bandwidth for this memory subsystem design is 8 GB/s. DIMMs must be loaded in pairs. Memory is protected by data error correcting codes (ECC). The hardware implementation supports the chip-spare for specific four-DIMM configurations.

The minimum amount of memory that can be installed is 512MB (2-256MB DIMMs). The maximum amount of memory that can be installed is dependent on the largest DIMM size (density) qualified for use. 16GB is the maximum memory (based on 2GB DIMMs).

The DIMMs used must be low-profile (1.2") DIMMs, to fit into the 1U chassis. The DIMMs are standard DDR2100 registered DIMMs. Only DIMMs qualified by HP for the hp Integrity rx1620 Server platform will be supported.

Architecture

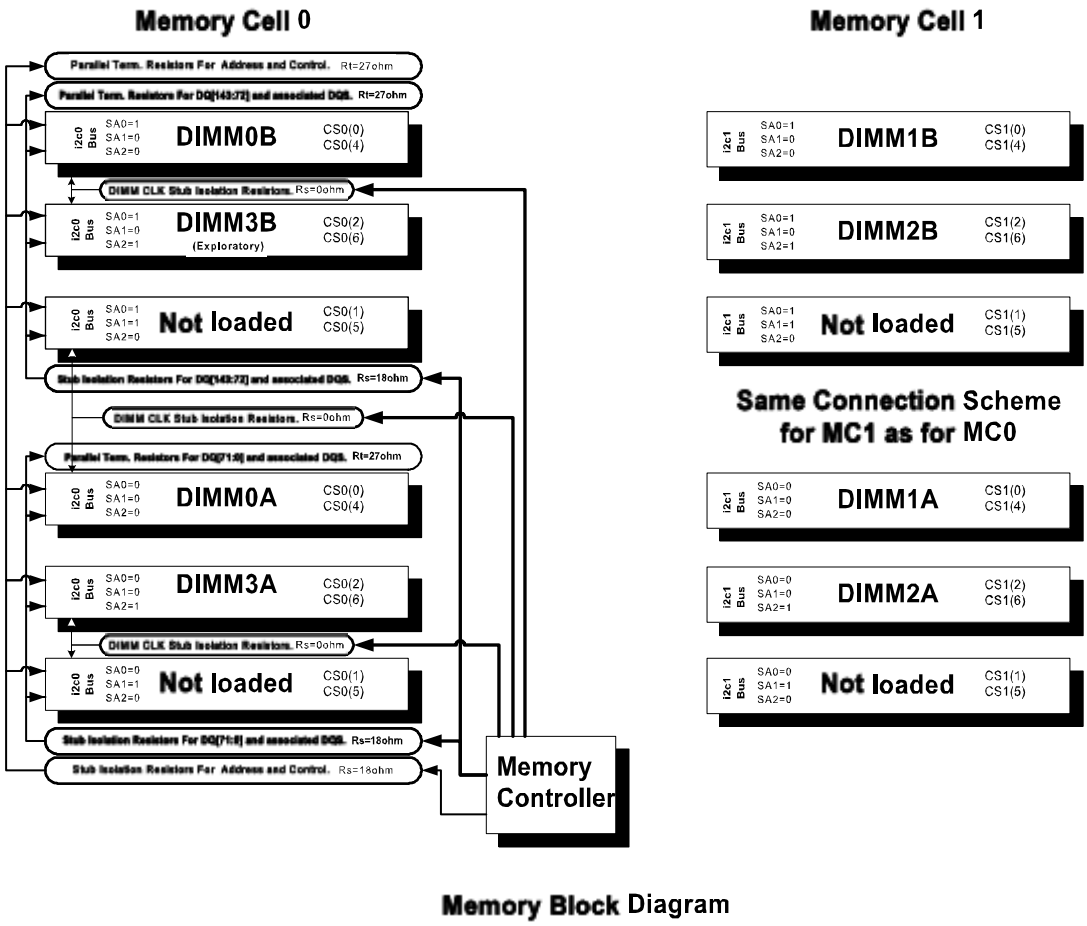
The memory interface supports two DDR cells, each of which is 144 data bits wide. The memory subsystem physical design uses a comb-filter termination scheme for both the data and address/control buses. This part of the topology is similar to other DDR designs in the computer industry. Clocks are distributed directly from the memory interface; each clock pair drives 2 DIMMs.

Memory data is protected by Error Correcting Code (ECC). 8 ECC bits per DIMM protect 64 bits of data. The use of ECC allows correction of single-bit errors, and detection of multi-bit errors. DIMMs without ECC will not be qualified or supported.

The memory subsystem features: address parity, address buffering, clock buffering, and industry standard SPD (Serial Presence Detect), IEEE 1149.1 Boundary Scan, and power bypassing near the memory components. The memory features x4 chip-spare and x8 detect. The memory subsystem does not support hot spare, mirroring, or hot-plug. The memory subsystem uses 1x direct attach mode, and does not use multiplexers.

The Memory Block Diagram indicates the recommended load order for DIMM pairs; DIMM0A/B should be loaded first, followed by DIMM1A/B, and so on.

Figure B-2 Memory Block Diagram



Memory Block Diagram

DIMMs

The memory subsystem will only support DDR SDRAM (Double Data Rate Synchronous Dynamic Random Access Memory) technology utilizing industry-standard PC2100 type DDR SDRAM DIMMs, 1.2" tall. This is expected to be the standard height available at first release and is currently being used by high-volume products. The DIMMs use a 184-pin JEDEC standard connector.

DIMMs must be loaded in pairs. To enable chip sparing, four DIMMs of the same density must be loaded with specific configuration rules. The following table summarizes memory solutions:

Table B-1 Memory Array Capacities

Min. / Max Memory Size	Single DIMM Size	DDR SDRAM Count, Type and Technology
0.5GB / 3GB	256MB	DIMM18 x 32Mb x 4 DDR SDRAMs (128Mb)
1GB / 4GB	512MB	DIMM18 x 32Mb x 4 DDR SDRAMs (256Mb)
2GB / 8GB	1024MB	DIMM18 x 64Mb x 4 DDR SDRAMs (512Mb)

Table B-1 Memory Array Capacities (Continued)

Min. / Max Memory Size	Single DIMM Size	DDR SDRAM Count, Type and Technology
4GB / 16GB	2048MB DIMM	DIMM36 x 128Mb x 4 DDR SDRAMs (512Mb, stacked)

Chip Spare Functionality

The memory subsystem design supports chip spare functionality. Chip spare enables an entire SDRAM chip on a DIMM to be bypassed (logically replaced) in the event that a multi-bit error is detected on that SDRAM. In order to use the chip spare functionality, only DIMMs built with x4 SDRAM parts can be used, and these DIMMs must be loaded in quads (2 DIMMs per memory cell, loaded in the same location in each memory cell). Each DIMM within a quad must be identical to all the other DIMMs in the quad.

Using the DIMM loading order indicated in the Memory Block Diagram, chip spare can be achieved if 4 identical DIMMs are loaded in the slots DIMM0A/B and DIMM1A/B. Addition of a pair of DIMMs beyond this quad (DIMM2A/B) negates the ability to support chip spare, so the maximum DIMM count with chip spare enabled is four. Note that if the system configuration is ever expanded to accommodate 8 DIMMs, chip spare is enabled if identical DIMM quads are loaded in slots DIMM0/1(A/B) and DIMM2/3(A/B).

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.

Serial Presence Detect (SPD)

Each DIMM contains an inter IC (I2C) EEPROM whose content describes the module's characteristics: speed, techno, revision, vendor, and so on. This feature is called serial presence detect (SPD). Firmware typically uses this information to detect unmatched pairs of DIMMs, and configure certain memory subsystem parameters. The SPD information for DIMMs loaded in the system will also be accessible to the baseboard management controller (BMC) through the I2C bus.

I/O Bus Interface

The I/O bus interface provides these features:

- Provides industry standard PCI-X 66MHz, 64 data bit support.
- Uses 3.3V PCI only.
- Optimizes for DMA performance.
- Supports 3.3V or Universal keyed PCI cards.
- Supports up to two PCI sockets.

Processor Dependent Hardware Controller

The processor dependent hardware controller (PDH) provides these features:

- 16-bit PDH bus with reserved address space for:
  - Flash memory

- Non-volatile memory
- Scratch RAM
- Real Time Clock
- UARTs
- External Registers
- Firmware read/writable registers
- Two general purpose 32-bit registers
- Semaphore registers
- Monarch selection registers
- Test and Reset register
- Reset and INIT generation

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 low pin count (LPC) support for HP Intel Itanium 2 platforms based on HP chipsets. This controller is connected to the PDH bus and 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 (ICMB) support
- Three I2C master/slave ports (one the ports is used for IPMB)
- 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 (IPMB)

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. The 53C1030 adheres to the PCI-X addendum to the PCI Local Specification and is hard-wired to PCI ID 1 which corresponds to bit 17 of the PCI AD bus.

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 Management LAN C

The 10/100 LAN port provides:

- A management LAN interface for operating system level manageability applications.

- The LAN controller is an Intel 82550 chip.

1Gb System LANs A and B

The 1Gb System LAN A and B ports provide:

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

USB Connectors

The USB connectors provide:

- 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

Data Pathing Information

The following table presents information about pathing in the hp Integrity rx1620 Server.

Table B-2 Data Pathing - Part 1

PCI Slot	PCI Card Information	Physical Location	ACPI Path
Core	USB Port (Core)	Rear Bulkhead Upper USB Connector	ACPI (HWP0002,0) / PCI (1|0) / USB (0, 0)
Core	USB Port (Core)	Not Available	ACPI (HWP0002,0) / PCI (1|0) / USB (1, 0)
Core	USB Port (Core)	Rear Bulkhead Lower USB Connector	ACPI (HWP0002,0) / PCI (1|1) / USB (0, 0)
Core	USB Port (Core)	Not Available	ACPI (HWP0002,0) / PCI (1|1) / USB (1, 0)
Core	USB Port (Core)	Not Available	ACPI (HWP0002,0) / PCI (1|2)
Core	IDE Controller (Core)	System Board	ACPI (HWP0002,0) / PCI (2|0)
Core	Internal IDE Device	Front DVD Drive Slot	ACPI (HWP0002,0) / PCI (2|0) / ATA
Core	Ultra 3 SCSI (Core) - Channel A	Disk “0” - Right Hand Internal Disk	(HWP0002,100) / PCI (1|0)
Core	Ultra 3 SCSI (Core) - Internal Disk	Disk “1” - Left Hand Internal Disk	(HWP0002,100) / PCI (1|0) / SCSI (Pun0,Lun0)

Table B-2 Data Pathing - Part 1

PCI Slot	PCI Card Information	Physical Location	ACPI Path
Core	Ultra 3 SCSI (Core) - Internal Disk	System Board	(HWP0002,100) / PCI (1|0) / SCSI (Pun1,Lun0)
Core	Ultra 3 SCSI (Core) - Channel B	Rear Bulkhead “SCSI LVD/SE”	(HWP0002,100) / PCI (1|1)
Core	Ultra 3 SCSI (Core) - Ext. SCSI	Rear Bulkhead “LAN Gb”	(HWP0002,100) / PCI (1|1) / SCSI (Punx,Luny)
Core	1000 BT LAN (Core)	Top Slot (full length PCI slot)	(HWP0002,100) / PCI (2|0)
1	PCI-X 133 MHz/64 Bit	Bottom Slot (half length PCI slot)	(HWP0002,400) / PCI (1|0)
2	PCI-X 133 MHz/64 Bit	Rear Bulkhead “Serial Console” connector	(HWP0002,200) / PCI (1|0)
MP	Serial Controller (MP)	Rear Bulkhead “Serial Console” connector[a]	(HWP0002,700) / PCI (1|0)
MP	Console Port (MP)	Rear Bulkhead “VGA” port[a]	(HWP0002,700) / PCI (1|1)
MP	VGA Controller (MP)	Disk “0” - Right Hand Internal Disk	(HWP0002,700) / PCI (2|0)

a. If using “W” cable P/N A6144-63001 it will break this port out to 3 x 9-pin RS-232 connectors labeled “Console”, “UPS”, and “Remote”. If using 25-pin cable only “Console” will be available.

Table B-3 Data Pathing - Part 2

PCI Slot	MAPPER Path	HP-UX Path	Linux Path	Windows Path
Core	0/0/1/0.0.0	0/0/1/0.1.2	00:01.0	
Core	0/0/1/0	0/0/1/0	00:01.0	
Core	0/0/1/1.0.0.0.0	0/0/1/1.1.2.3	00:01.1	
Core	0/0/1/1.0.0.0.1	0/0/1/1	00:01.1	
Core	0/0/1/2	0/0/1/2	00:01.2	
Core	0/0/2/0	0/0/2/0	00:02.0	
Core	0/0/2/0.0.0	0/0/2/0.0.0.0		
Core	0/1/1/0	0/1/1/0	20:01.0	
Core	0/1/1/0.0.0	0/1/1/0.0.0		

Table B-3 Data Pathing - Part 2

PCI Slot	MAPPER Path	HP-UX Path	Linux Path	Windows Path
Core	0/1/1/0.1.0	0/1/1/0.1.0		
Core	0/1/1/1	0/1/1/1	20:01.1	
Core	0/1/1/1.x.y	0/1/1/1.x.y		
Core	0/1/2/0	0/1/2/0	20:02.0	
1	0/4[a]	0/3[a]	80:01.0	
2	0/2[a]	0/2[a]	40:01.0	
MP	0/7/1/0[a]	0/4/1/0[b]	E0:01.0	
MP	0/7/1/1[a]	0/4/1/1[b]	E0:01.1	
MP	0/7/2/0[a]	0/4/2/0[a]	E0:02.0	

a. Conflict with HP-UX ioscan vs. ODE Mapper
b. 0/4/1/0 port 0 = “UPS port”, 0/4/1/1 port 0 = “Console port”, 0/4/1/1 port 2 = “Remote port”

Table B-4 Data Pathing - Part 3

PCI Slot	Rope Number	ACPI HID	ACPI UID	PCI Bus Address	PCI Bus Number	PCI Host Controller Number
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	1	HWP0002	0x000	0x00-0x1F	0	0
Core	0	HWP0002	0x100	0x20-0x3F	1	1
Core	0	HWP0002	0x100	0x20-0x3F	1	1
Core	0	HWP0002	0x100	0x20-0x3F	1	1
Core	0	HWP0002	0x100	0x20-0x3F	1	1
Core	0	HWP0002	0x100	0x20-0x3F	1	1
Core	0	HWP0002	0x100	0x20-0x3F	1	1

Table B-4 Data Pathing - Part 3

PCI Slot	Rope Number	ACPI HID	ACPI UID	PCI Bus Address	PCI Bus Number	PCI Host Controller Number
1	4/5	HWP0002	0x400	0x80-0xBF	3	3
2	2/3	HWP0002	0x200	0x40-0x7F	4	2?
MP	7	HWP0002	0x700	0xE0-0xFF	7?	4?
MP	7	HWP0002	0x700	0xE0-0xFF	7?	4?
MP	7	HWP0002	0x700	0xE0-0xFF	7?	4?

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